

NORTHERN TELECOM

DMS*-100 FAMILY

F E A T U R E
D E S C R I P T I O N
M A N U A L

Issue: DMS ALL BCS27

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FEATURE DESCRIPTION MANUAL

This report is the Feature Description Manual which gives a brief description of the features. The report is intended to describe how the feature operates without the detailed instructions found in the NTP.

The DMS100 software can be defined in terms of features, feature packages and master packages. At the lowest level there are features. A feature is an application software item defined by marketing (ex speed calling). Features cannot be ordered individually; they must be ordered in the form of a feature package. A feature package is a set of features grouped into a single functional unit. Some of these feature packages are then grouped into a major group package for the convenience of ordering.

Major package	Feature package	Features
-----	-----	-----
NTX002AA14	----- - NTX000AA06	--- ----- F3862
		--- ----- F3884
		--- ----- F3888
		--- ----- . . .
	----- - NTX001AA14	--- ----- F0010
		--- ----- F0011
		--- ----- . . .
	----- - NTX901AA12	--- ----- F0018
		--- ----- F0019
		--- ----- . . .

The feature description manual has the following two sections:

- Section A: INDEX OF PACKAGES and CROSS REFERENCES
- Section B: AVAILABLE FEATURES

The two sections of the report are structured as follows:

- SECTION A - Indexes (several) and cross references
 - A.1 - Index of major packages and the feature packages that they contain
 - A.2 - Index of packages
 - A.3 - Index of features - sorted by title
 - A.4 - Index of features - sorted by feature number
 - A.5 - Package interdependencies (pkg pre-requisites)
- SECTION B. Feature Descriptions - list of features, which are RTM or A+M within the feature package, followed by a brief description of each feature.

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NTXD00AA03	STATUS: RTM	TITLE: POTS TO RES CONVERTER
NTXA64AA03		RES(RESIDENTIAL ENHANCED SERVICES) BASE
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX100AA20		INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
NTX413AA01		IBN - ENHANCED CALL FORWARDING
NTX898AA01		VARIABLE SPEED CALL ACCESS CODE - IBN
NTX901AA17		LOCAL FEATURES I
NTXD04AA02	STATUS: RTM	TITLE: DMS-100 FAMILY MAINTENANCE: LOCAL
NTX122AA02		OM - CALL ATTEMPTS SUMMARY
NTX195AA05		MECHANIZED LOOP TESTER (MLT) I/F
NTX272AA02		FOCUSSED MAINTENANCE
NTX277AA02		DIALABLE LINE CIRCUIT IDENTIFICATION
NTX385AA01		OM THRESHOLDING AND ALARMS
NTX445AB01		O.M. SELECTIVE OUTPUT (UPGRADE OF NTX445AA)
NTX881AC02		SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB)
NTX885AB01		SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA)
NTXD05AA02	STATUS: RTM	TITLE: DMS-100 FAMILY MAINTENANCE: TOLL
NTX122AA02		OM - CALL ATTEMPTS SUMMARY
NTX272AA02		FOCUSSED MAINTENANCE
NTX385AA01		OM THRESHOLDING AND ALARMS
NTX445AB01		O.M. SELECTIVE OUTPUT (UPGRADE OF NTX445AA)
NTX882AA03		BIT ERROR RATIO INDICATOR FOR TOLL SWITCHES
NTX885AB01		SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA)
NTX002AA21	STATUS: RTM	TITLE: LOCAL BASIC
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX901AA17		LOCAL FEATURES I
NTX002AC07	STATUS: RTM	TITLE: LOCAL STANDARD (UPGRADE OF NTX002AB)
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX006AA04		BUSINESS LINES
NTX007AB02		PBX INTERFACE I (UPGRADE OF NTX007AA)
NTX053AA05		MAINTENANCE ASSISTANCE PACKAGE
NTX901AA17		LOCAL FEATURES I
NTX902AA07		LOCAL FEATURES II
NTX003AB07	STATUS: RTM	TITLE: LOCAL ENHANCED(UPGRADE OF NTX003AA)
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
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NTX006AA04	BUSINESS LINES	
NTX007AB02	PBX INTERFACE I (UPGRADE OF NTX007AA)	
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE	
NTX056AA04	ENHANCED ADMINISTRATION	
NTX901AA17	LOCAL FEATURES I	
NTX902AA07	LOCAL FEATURES II	
NTX004AA21	STATUS: RTM	TITLE: TOLL BASIC
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX801AA01	TOLL FEATURES I	
NTX004AB21	STATUS: RTM	TITLE: TOLL STANDARD
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE	
NTX060AB10	NETWORK MANAGEMENT	
NTX801AA01	TOLL FEATURES I	
NTX802AA04	TOLL FEATURES II	
NTX005AA21	STATUS: RTM	TITLE: TOLL ENHANCED
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE	
NTX056AA04	ENHANCED ADMINISTRATION	
NTX060AB10	NETWORK MANAGEMENT	
NTX801AA01	TOLL FEATURES I	
NTX802AA04	TOLL FEATURES II	
NTX069AA21	STATUS: RTM	TITLE: LOCAL TOLL BASIC
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX801AA01	TOLL FEATURES I	
NTX901AA17	LOCAL FEATURES I	
NTX069BB07	STATUS: RTM	TITLE: LOCAL TOLL ENHANCED(UPGRADE OF NTX069BA)
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX006AA04	BUSINESS LINES	
NTX007AB02	PBX INTERFACE I (UPGRADE OF NTX007AA)	
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE	
NTX056AA04	ENHANCED ADMINISTRATION	
NTX060AB10	NETWORK MANAGEMENT	
NTX801AA01	TOLL FEATURES I	
NTX802AA04	TOLL FEATURES II	
NTX901AA17	LOCAL FEATURES I	
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NTX902AA07	LOCAL FEATURES II	
NTX073AC05	STATUS: RTM	TITLE: A T & T - TOLL(UPG OF NTX073AB)
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX048AA04	SYNCHRONIZATION	
NTX051AA02	AUTOMATIC TRUNK TESTING	
NTX052AB02	REMOTE OFFICE TEST LINE (ROTL)	
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE	
NTX055AA03	TRUNK TEST POSITION (TTP)	
NTX055AB03	TTP-DIGIT VERIFICATION	
NTX055AC02	TTP-TRANSMISSION MEASUREMENT	
NTX056AA04	ENHANCED ADMINISTRATION	
NTX060AB10	NETWORK MANAGEMENT	
NTX060BB01	NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)	
NTX098AA03	BELLCORE CAMA FORMAT	
NTX099AA01	OPERATIONAL MEASUREMENTS ENHANCEMENTS	
NTX176AA05	NON RESIDENT ADMINISTRATIVE AIDS	
NTX178AA01	NON RESIDENT DIAGNOSTIC UTILITIES	
NTX801AA01	TOLL FEATURES I	
NTX802AA04	TOLL FEATURES II	
NTX171BA03	STATUS: RTM	TITLE: MCCS CCIS6
NTX040AA03	COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC	
NTX171CA02	MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA /NTX286BA	
NTX197AA01	CCIS DIRECT SIGNALLING	
NTX286BA02	STATUS: RTM	TITLE: MCCS - O.C REMOTE
NTX134BA02	REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING	
NTX171CA02	MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA /NTX286BA	
NTX286AA01	MCCS - QUERY VIA OC DATA LINK(ORDER BY MASTER_PKG NTX286BA)	
NTX287AC11	STATUS: RTM	TITLE: TOPS STANDARD
NTX030BA03	TOPS ACD FEATURES	
NTX030CC10	TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)	
NTX289AC11	STATUS: RTM	TITLE: REMOTE OPERATOR CENTRALIZATION(OC)(UPG.OF NTX289AB)
NTX030CC10	TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)	
NTX134BA02	REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING	
NTX520AC06	STATUS: RTM	TITLE: BOC - DMS 100/200 STANDARD (UPG. OF NTX520AB)
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NTX000AA13	BILGE
NTX001AA21	COMMON BASIC
NTX006AA04	BUSINESS LINES
NTX007AB02	PBX INTERFACE I (UPGRADE OF NTX007AA)
NTX044AA04	CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
NTX048AA04	SYNCHRONIZATION
NTX051AA02	AUTOMATIC TRUNK TESTING
NTX052AB02	REMOTE OFFICE TEST LINE (ROTL)
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE
NTX054AA05	LINE TEST POSITION (LTP)
NTX055AA03	TRUNK TEST POSITION (TTP)
NTX055AB03	TTP-DIGIT VERIFICATION
NTX055AC02	TTP-TRANSMISSION MEASUREMENT
NTX056AA04	ENHANCED ADMINISTRATION
NTX060AB10	NETWORK MANAGEMENT
NTX064AA01	AUTOMATIC LINE INSULATION TESTING (ALIT)
NTX076AA01	AMA - ENHANCED
NTX082AA01	SUBSCRIBER LINE MEASUREMENTS
NTX085AA05	TRAFFIC SEPARATION PEG COUNT
NTX087AA04	TRAFFIC SEPARATION USAGE
NTX088AA04	TRAFFIC SEPARATION REPORT
NTX098AA03	BELLCORE CAMA FORMAT
NTX099AA01	OPERATIONAL MEASUREMENTS ENHANCEMENTS
NTX146AA03	REMOTE LINE CONCENTRATING MODULE (RLCM)
NTX147AB01	OUTSIDE PLANT MODULE MAINTENANCE (UPGRADE OF NTX147AA)
NTX176AA05	NON RESIDENT ADMINISTRATIVE AIDS
NTX177AA01	NON RESIDENT GENERAL UTILITIES
NTX178AA01	NON RESIDENT DIAGNOSTIC UTILITIES
NTX269AA07	UNIVERSAL TONE RECEIVER (DOMESTIC)
NTX270AA12	NEW PERIPHERAL MAINTENANCE PACKAGE
NTX291AA04	ENHANCED REAL TIME INDICATOR
NTX801AA01	TOLL FEATURES I
NTX802AA04	TOLL FEATURES II
NTX901AA17	LOCAL FEATURES I
NTX902AA07	LOCAL FEATURES II

NTX521AC06 STATUS: RTM TITLE: BOC - DMS 100 STANDARD (UPG. OF NTX521AB)

NTX000AA13	BILGE
NTX001AA21	COMMON BASIC
NTX006AA04	BUSINESS LINES
NTX007AB02	PBX INTERFACE I (UPGRADE OF NTX007AA)
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE
NTX054AA05	LINE TEST POSITION (LTP)
NTX055AA03	TRUNK TEST POSITION (TTP)
NTX056AA04	ENHANCED ADMINISTRATION
NTX064AA01	AUTOMATIC LINE INSULATION TESTING (ALIT)
NTX082AA01	SUBSCRIBER LINE MEASUREMENTS
NTX085AA05	TRAFFIC SEPARATION PEG COUNT
NTX087AA04	TRAFFIC SEPARATION USAGE

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NTX088AA04	TRAFFIC SEPARATION REPORT	
NTX146AA03	REMOTE LINE CONCENTRATING MODULE (RLCM)	
NTX147AB01	OUTSIDE PLANT MODULE MAINTENANCE (UPGRADE OF NTX147AA)	
NTX176AA05	NON RESIDENT ADMINISTRATIVE AIDS	
NTX177AA01	NON RESIDENT GENERAL UTILITIES	
NTX178AA01	NON RESIDENT DIAGNOSTIC UTILITIES	
NTX269AA07	UNIVERSAL TONE RECEIVER (DOMESTIC)	
NTX270AA12	NEW PERIPHERAL MAINTENANCE PACKAGE	
NTX291AA04	ENHANCED REAL TIME INDICATOR	
NTX901AA17	LOCAL FEATURES I	
NTX902AA07	LOCAL FEATURES II	
NTX522AC06	STATUS: RTM	TITLE: BOC - DMS 200 STANDARD (UPG. OF NTX522AB)
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX044AA04	CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)	
NTX048AA04	SYNCHRONIZATION	
NTX051AA02	AUTOMATIC TRUNK TESTING	
NTX052AB02	REMOTE OFFICE TEST LINE (ROTL)	
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE	
NTX055AA03	TRUNK TEST POSITION (TTP)	
NTX055AB03	TTP-DIGIT VERIFICATION	
NTX055AC02	TTP-TRANSMISSION MEASUREMENT	
NTX056AA04	ENHANCED ADMINISTRATION	
NTX060AB10	NETWORK MANAGEMENT	
NTX076AA01	AMA - ENHANCED	
NTX085AA05	TRAFFIC SEPARATION PEG COUNT	
NTX087AA04	TRAFFIC SEPARATION USAGE	
NTX088AA04	TRAFFIC SEPARATION REPORT	
NTX098AA03	BELLCORE CAMA FORMAT	
NTX099AA01	OPERATIONAL MEASUREMENTS ENHANCEMENTS	
NTX176AA05	NON RESIDENT ADMINISTRATIVE AIDS	
NTX177AA01	NON RESIDENT GENERAL UTILITIES	
NTX178AA01	NON RESIDENT DIAGNOSTIC UTILITIES	
NTX269AA07	UNIVERSAL TONE RECEIVER (DOMESTIC)	
NTX270AA12	NEW PERIPHERAL MAINTENANCE PACKAGE	
NTX291AA04	ENHANCED REAL TIME INDICATOR	
NTX801AA01	TOLL FEATURES I	
NTX802AA04	TOLL FEATURES II	
NTX530AC06	STATUS: RTM	TITLE: DMS 100/200 STANDARD (IOC) (UPG. OF NTX530AB)
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX006AA04	BUSINESS LINES	
NTX007AB02	PBX INTERFACE I (UPGRADE OF NTX007AA)	
NTX042AA04	LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)	
NTX044AA04	CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)	
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NTX270AA12		NEW PERIPHERAL MAINTENANCE PACKAGE
NTX291AA04		ENHANCED REAL TIME INDICATOR
NTX901AA17		LOCAL FEATURES I
NTX902AA07		LOCAL FEATURES II
NTX532AC06	STATUS: RTM	TITLE: DMS 200 STANDARD(IOC)(UPG. OF NTX532AB)
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX044AA04		CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
NTX048AA04		SYNCHRONIZATION
NTX051AA02		AUTOMATIC TRUNK TESTING
NTX052AB02		REMOTE OFFICE TEST LINE (ROTL)
NTX053AA05		MAINTENANCE ASSISTANCE PACKAGE
NTX055AA03		TRUNK TEST POSITION (TTP)
NTX055AB03		TTP-DIGIT VERIFICATION
NTX055AC02		TTP-TRANSMISSION MEASUREMENT
NTX056AA04		ENHANCED ADMINISTRATION
NTX060AB10		NETWORK MANAGEMENT
NTX085AA05		TRAFFIC SEPARATION PEG COUNT
NTX087AA04		TRAFFIC SEPARATION USAGE
NTX088AA04		TRAFFIC SEPARATION REPORT
NTX176AA05		NON RESIDENT ADMINISTRATIVE AIDS
NTX177AA01		NON RESIDENT GENERAL UTILITIES
NTX178AA01		NON RESIDENT DIAGNOSTIC UTILITIES
NTX269AA07		UNIVERSAL TONE RECEIVER(DOMESTIC)
NTX270AA12		NEW PERIPHERAL MAINTENANCE PACKAGE
NTX291AA04		ENHANCED REAL TIME INDICATOR
NTX801AA01		TOLL FEATURES I
NTX802AA04		TOLL FEATURES II
NTX704AA05	STATUS: RTM	TITLE: TOPS MP STANDARD
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX030BA03		TOPS ACD FEATURES
NTX030CC10		TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX724AA02		TOPS MP INTERFACE
NTX731AA03		TOPS MP - TERMINAL HANDLER
NTX704AB01	STATUS: RTM	TITLE: TOPS MP STANDARD(UPG.OF NTX704AA IN BCS27)
NTXA28AA02		TOPS AWT ENHANCEMENTS
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX030BA03		TOPS ACD FEATURES
NTX030CC10		TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX724AA02		TOPS MP INTERFACE
NTX731AA03		TOPS MP - TERMINAL HANDLER
NTX706AA04	STATUS: RTM	TITLE: TOPS MP REMOTE
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NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX030CC10		TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX134BA02		REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING
NTX724AA02		TOPS MP INTERFACE
NTX871AA01		REMOTE TOPS MP O.C. DATA LINK HANDLING
NTX706AB01	STATUS: RTM	TITLE: TOPS MP REMOTE(UPG.OF NTX706AA IN BCS27)
NTXA28AA02		TOPS AWT ENHANCEMENTS
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX030CC10		TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX134BA02		REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING
NTX724AA02		TOPS MP INTERFACE
NTX871AA01		REMOTE TOPS MP O.C. DATA LINK HANDLING
NTX708AA01	STATUS: RTM	TITLE: TOPS MP - TOLL & DIR. ASS. OPERATION
NTXA28AA02		TOPS AWT ENHANCEMENTS
NTXA62AA01		TOPS MP DA/AUDIO RESPONSE
NTXA90AA01		TOPS-MP TERMINAL HANDLER HIGH SPEED
NTX030BA03		TOPS ACD FEATURES
NTX030CC10		TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX273AA07		MULTI - PROTOCOL CONTROLLER BX.25
NTX645AA01		TOPS - SERVICE BILLING
NTX724AA02		TOPS MP INTERFACE
NTX892AA03		MPC MULTILINK MANAGEMENT
NTX709AA01	STATUS: RTM	TITLE: TOPS MP - TOLL & DIR. ASS. OPRTN - REMOTE
NTXA28AA02		TOPS AWT ENHANCEMENTS
NTXA62AA01		TOPS MP DA/AUDIO RESPONSE
NTX030CC10		TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX273AA07		MULTI - PROTOCOL CONTROLLER BX.25
NTX645AA01		TOPS - SERVICE BILLING
NTX724AA02		TOPS MP INTERFACE
NTX871AA01		REMOTE TOPS MP O.C. DATA LINK HANDLING
NTX892AA03		MPC MULTILINK MANAGEMENT
NTX810AC04	STATUS: A+M	TITLE: LBR MASTER SOFTWARE PKG (UPG. BY NTX810AD)
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX006AA04		BUSINESS LINES
NTX007AB02		PBX INTERFACE I (UPGRADE OF NTX007AA)
NTX008AB02		PBX INTERFACE II(UPG. OF NTX008AA)
NTX020AC01		VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
NTX041AA07		CCS7 - MTP/SCCP(UPG. BY NTX041AB)
NTX042AA04		LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
NTX043AA03		LOCAL CALL DETAIL RECORDING
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NTX048AA04	SYNCHRONIZATION
NTX048BA02	SYNCHRONIZATION - STRATUM 3
NTX051AA02	AUTOMATIC TRUNK TESTING
NTX052AB02	REMOTE OFFICE TEST LINE (ROTL)
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE
NTX054AA05	LINE TEST POSITION (LTP)
NTX055AA03	TRUNK TEST POSITION (TTP)
NTX056AA04	ENHANCED ADMINISTRATION
NTX057DA01	CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX057AC)
NTX064AA01	AUTOMATIC LINE INSULATION TESTING (ALIT)
NTX072AA01	INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
NTX074AA06	DISK DATA STORAGE SYSTEM
NTX082AA01	SUBSCRIBER LINE MEASUREMENTS
NTX085AA05	TRAFFIC SEPARATION PEG COUNT
NTX087AA04	TRAFFIC SEPARATION USAGE
NTX088AA04	TRAFFIC SEPARATION REPORT
NTX100AA20	INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
NTX102AA04	IBN - STATION MESSAGE DETAIL RECORDING
NTX106AA09	IBN - PROPRIETARY BUSINESS SET
NTX112AB03	IBN - VIRTUAL FACILITY GROUPS
NTX145AA05	REMOTE SWITCHING CENTER
NTX146AA03	REMOTE LINE CONCENTRATING MODULE (RLCM)
NTX147AB01	OUTSIDE PLANT MODULE MAINTENANCE(UPGRADE OF NTX147AA)
NTX159AA06	BELLCORE LAMA FORMAT
NTX167AB04	CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
NTX176AA05	NON RESIDENT ADMINISTRATIVE AIDS
NTX177AA01	NON RESIDENT GENERAL UTILITIES
NTX178AA01	NON RESIDENT DIAGNOSTIC UTILITIES
NTX186AA06	EQUAL ACCESS END OFFICE
NTX250AA12	DATAPATH - BASIC
NTX269AA07	UNIVERSAL TONE RECEIVER(DOMESTIC)
NTX270AA12	NEW PERIPHERAL MAINTENANCE PACKAGE
NTX273AA07	MULTI - PROTOCOL CONTROLLER BX.25
NTX291AA04	ENHANCED REAL TIME INDICATOR
NTX430AA02	ESN
NTX560AB02	NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX562AA02	NOS - DATA COLLECTION
NTX812AA03	CENTRALIZED MAP
NTX813AA01	CENTRALIZED ALARMS
NTX901AA17	LOCAL FEATURES I
NTX902AA07	LOCAL FEATURES II

NTX810AD01	STATUS: RTM	TITLE: LBR MASTER SOFTWARE PKG (UPG. OF NTX810AC)
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NTX000AA13	BILGE
NTX001AA21	COMMON BASIC
NTX006AA04	BUSINESS LINES
NTX007AB02	PBX INTERFACE I (UPGRADE OF NTX007AA)
NTX008AB02	PBX INTERFACE II(UPG. OF NTX008AA)
NTX020AC01	VERTICAL SERVICES I (UPGRADE FROM NTX020AB)

NTX041AB04	CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX042AA04	LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
NTX043AA03	LOCAL CALL DETAIL RECORDING
NTX048AA04	SYNCHRONIZATION
NTX048BA02	SYNCHRONIZATION - STRATUM 3
NTX051AA02	AUTOMATIC TRUNK TESTING
NTX052AB02	REMOTE OFFICE TEST LINE (ROTL)
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE
NTX054AA05	LINE TEST POSITION (LTP)
NTX055AA03	TRUNK TEST POSITION (TTP)
NTX056AA04	ENHANCED ADMINISTRATION
NTX057EA01	CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX057DA)
NTX064AA01	AUTOMATIC LINE INSULATION TESTING (ALIT)
NTX072AA01	INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
NTX074AA06	DISK DATA STORAGE SYSTEM
NTX082AA01	SUBSCRIBER LINE MEASUREMENTS
NTX085AA05	TRAFFIC SEPARATION PEG COUNT
NTX087AA04	TRAFFIC SEPARATION USAGE
NTX088AA04	TRAFFIC SEPARATION REPORT
NTX100AA20	INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
NTX102AA04	IBN - STATION MESSAGE DETAIL RECORDING
NTX106AA09	IBN - PROPRIETARY BUSINESS SET
NTX112AB03	IBN - VIRTUAL FACILITY GROUPS
NTX145AA05	REMOTE SWITCHING CENTER
NTX146AA03	REMOTE LINE CONCENTRATING MODULE (RLCM)
NTX147AB01	OUTSIDE PLANT MODULE MAINTENANCE(UPGRADE OF NTX147AA)
NTX159AA06	BELLCORE LAMA FORMAT
NTX167AB04	CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
NTX176AA05	NON RESIDENT ADMINISTRATIVE AIDS
NTX177AA01	NON RESIDENT GENERAL UTILITIES
NTX178AA01	NON RESIDENT DIAGNOSTIC UTILITIES
NTX186AA06	EQUAL ACCESS END OFFICE
NTX250AA12	DATAPATH - BASIC
NTX269AA07	UNIVERSAL TONE RECEIVER(DOMESTIC)
NTX270AA12	NEW PERIPHERAL MAINTENANCE PACKAGE
NTX273AA07	MULTI - PROTOCOL CONTROLLER BX.25
NTX291AA04	ENHANCED REAL TIME INDICATOR
NTX430AA02	ESN
NTX560AB02	NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX562AA02	NOS - DATA COLLECTION
NTX812AA03	CENTRALIZED MAP
NTX813AA01	CENTRALIZED ALARMS
NTX901AA17	LOCAL FEATURES I
NTX902AA07	LOCAL FEATURES II

NTX811AA05	STATUS: RTM	TITLE: LBR/HOST - NETWORK ACCESS POINT
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NTX000AA13	BILGE
NTX001AA21	COMMON BASIC
NTX803AA02	EQUAL ACCESS ALTERNATE SWITCHING POINT

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NTX812AA03	CENTRALIZED MAP	
NTX813AA01	CENTRALIZED ALARMS	
NTX816AC04	STATUS: A+M	TITLE: LBR MASTER SOFTWARE PKG - USTA(UPG. BY NTX816AD)
NTX000AA13	BILGE	
NTX001AA21	COMMON BASIC	
NTX006AA04	BUSINESS LINES	
NTX007AB02	PBX INTERFACE I (UPGRADE OF NTX007AA)	
NTX008AB02	PBX INTERFACE II(UPG. OF NTX008AA)	
NTX020AC01	VERTICAL SERVICES I (UPGRADE FROM NTX020AB)	
NTX041AA07	CCS7 - MTP/SCCP(UPG. BY NTX041AB)	
NTX042AA04	LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)	
NTX043AA03	LOCAL CALL DETAIL RECORDING	
NTX048AA04	SYNCHRONIZATION	
NTX048BA02	SYNCHRONIZATION - STRATUM 3	
NTX051AA02	AUTOMATIC TRUNK TESTING	
NTX052AB02	REMOTE OFFICE TEST LINE (ROTL)	
NTX053AA05	MAINTENANCE ASSISTANCE PACKAGE	
NTX054AA05	LINE TEST POSITION (LTP)	
NTX055AA03	TRUNK TEST POSITION (TTP)	
NTX056AA04	ENHANCED ADMINISTRATION	
NTX057DA01	CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX057AC)	
NTX064AA01	AUTOMATIC LINE INSULATION TESTING (ALIT)	
NTX072AA01	INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)	
NTX074AA06	DISK DATA STORAGE SYSTEM	
NTX082AA01	SUBSCRIBER LINE MEASUREMENTS	
NTX085AA05	TRAFFIC SEPARATION PEG COUNT	
NTX087AA04	TRAFFIC SEPARATION USAGE	
NTX088AA04	TRAFFIC SEPARATION REPORT	
NTX100AA20	INTEGRATED BUSINESS NETWORKS - BASIC (IBN)	
NTX102AA04	IBN - STATION MESSAGE DETAIL RECORDING	
NTX106AA09	IBN - PROPRIETARY BUSINESS SET	
NTX112AB03	IBN - VIRTUAL FACILITY GROUPS	
NTX145AA05	REMOTE SWITCHING CENTER	
NTX146AA03	REMOTE LINE CONCENTRATING MODULE (RLCM)	
NTX147AB01	OUTSIDE PLANT MODULE MAINTENANCE(UPGRADE OF NTX147AA)	
NTX159AA06	BELLCORE LAMA FORMAT	
NTX167AB04	CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)	
NTX176AA05	NON RESIDENT ADMINISTRATIVE AIDS	
NTX177AA01	NON RESIDENT GENERAL UTILITIES	
NTX178AA01	NON RESIDENT DIAGNOSTIC UTILITIES	
NTX186AA06	EQUAL ACCESS END OFFICE	
NTX250AA12	DATAPATH - BASIC	
NTX269AA07	UNIVERSAL TONE RECEIVER(DOMESTIC)	
NTX270AA12	NEW PERIPHERAL MAINTENANCE PACKAGE	
NTX273AA07	MULTI - PROTOCOL CONTROLLER BX.25	
NTX291AA04	ENHANCED REAL TIME INDICATOR	
NTX430AA02	ESN	
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NTX560AB02		NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX562AA02		NOS - DATA COLLECTION
NTX812AA03		CENTRALIZED MAP
NTX813AA01		CENTRALIZED ALARMS
NTX901AA17		LOCAL FEATURES I
NTX902AA07		LOCAL FEATURES II
NTX832AA03	STATUS: RTM	TITLE: STP BASE
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX041AB04		CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX210AA03		NO. 2 SCC INTERFACE
NTX270AA12		NEW PERIPHERAL MAINTENANCE PACKAGE
NTX940AA06		CM BILGE
NTX941AA05		CM COMMON
NTX942AA04		DMS - SUPERNODE SYSTEM LOAD MODULE(SLM)
NTX960AA06	STATUS: A+M	TITLE: DMS - SUPERNODE BASIC (UPG BY NTX960AB)
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX940AA06		CM BILGE
NTX941AA05		CM COMMON
NTX960AB02	STATUS: RTM	TITLE: DMS - SUPERNODE BASIC (UPG OF NTX960AA)
NTX000AA13		BILGE
NTX001AA21		COMMON BASIC
NTX940AA06		CM BILGE
NTX941AA05		CM COMMON
NTX942AA04		DMS - SUPERNODE SYSTEM LOAD MODULE(SLM)
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PEC	Status	Title
NTXA00AA02	LTD	CLASS - CALL SETUP
NTXA01AA01	LTD	CLASS: CALLING NUMBER DISPLAY
NTXA02AA02	LTD	CLASS: CUSTOMER ORIGINATED TRACE
NTXA11AA01	LTD	PATCH ADMINISTRATION & DOWNLOADING VIA X.25
NTXA15AA01	LTD	CALL PROGRESS TONES
NTXA20AA01	LTD	TOPS MP INTERFACE TO OPERATOR REFERENCE DATABASE
NTXA24AA01	RTM	EQUAL ACCESS ENHANCED CARRIER TOLL DENIAL
NTXA26AA01	RTM	TOPS INCOMING FEATURE GROUP D SIGNALLING
NTXA27AA01	RTM	EXECUTIVE CONFERENCE
NTXA28AA02	LTD	TOPS AWT ENHANCEMENTS
NTXA31AA01	RTM	DISA THIRD DIAL TONE - IBN
NTXA32AA01	RTM	DISTINCTIVE CALL WAITING RINGBACK
NTXA33AA01	RTM	MADN RING FORWARD
NTXA35AA03	LTD	NETWORK NUMBER DISPLAY
NTXA36AA01	LTD	NETWORK WIDE RING AGAIN
NTXA39AA01	LTD	MERIDIAN NETWORK ATTENDANT SERVICE
NTXA40AA02	RTM	DIRECTORY NUMBER (DN) ATTRIBUTES
NTXA41AA01	LTD	CLASS: CALLING NUMBER DELIVERY BLOCKING ADMINISTRATION
NTXA43AA01	LTD	CALL FORWARD REMOTE ACTIVATION
NTXA52AA01	A+M	ACD REMOTE LOAD MANAGEMENT(UPG.BY NTXA52AB)
NTXA52AB01	RTM	ACD REMOTE LOAD MANAGEMENT I (UPG. OF NTXA52AA IN BCS26)
NTXA60AA01	RTM	TOPS CLOSEDOWN(REPLACES NTX134BB AND NTX039AB)
NTXA62AA01	LTD	TOPS MP DA/AUDIO RESPONSE
NTXA63AA01	LTD	TOPS MP AUDIO RESPONSE INTERFACE I
NTXA64AA03	LTD	RES(RESIDENTIAL ENHANCED SERVICES) BASE
NTXA66AA01	LTD	ENHANCED OFFICE RECOVERY
NTXA67AA01	LTD	EXTENDED XPM DIAGNOSTICS
NTXA69AA01	LTD	DIGITAL NAILED-UP SPECIAL SERVICE
NTXA72AA01	RTM	SECONDARY MADN CALL FORWARDING
NTXA77AA01	RTM	ENHANCED UCD
NTXA79AA02	LTD	IBN TRUNKS WITH ISUP SIGNALLING
NTXA80AA01	LTD	NETWORK NAME DISPLAY
NTXA81AA01	LTD	EXTENSION BRIDGED SERVICES
NTXA82AA02	LTD	CLASS LINE OFFICE DATA
NTXA83AA01	RTO	TOPS MESSAGE SWITCH
NTXA84AA01	RTM	EBS - MUSIC ON HOLD
NTXA85AA01	RTO	SUBSCRIBER MODULE SLC-96/REMOTE
NTXA89AA01	LTD	SMDR TIME DUMP FOR BNM
NTXA90AA01	LTD	TOPS-MP TERMINAL HANDLER HIGH SPEED
NTXA91AA01	LTD	STANDARD INTERFACE FOR DA/INTERCEPT APPLICATIONS
NTXE00AA01	LTD	TOPS OPERATOR PASSWORD
NTXE04AA01	RTO	SCREENED SERVICE ROUTING
NTXE13AA01	RTO	CCS7 ISUP INTERLATA CONNECTION EAEO - AT
NTXE14AA01	RTO	CCS7 ISUP INTERLATA CONNECTION AT - EAEO
NTXE32AA01	LTD	CCS7 PREVENTATIVE CYCLICAL RETRANSMISSION
NTXE39AA01	LTD	CALL FORWARD BUSY/DON'T ANSWER SPLITS
NTXE60AA01	LTD	DATAPATH - CLOSED USER GROUPS (U.S.)

PEC	Status	Title
NTX000AA13	RTM	BILGE
NTX001AA21	RTM	COMMON BASIC
NTX006AA04	RTM	BUSINESS LINES
NTX007AB02	RTM	PBX INTERFACE I (UPGRADE OF NTX007AA)
NTX008AB02	RTM	PBX INTERFACE II(UPG. OF NTX008AA)
NTX010AA01	RTO	AUTOMATIC INTERCEPT SERVICE - LOCAL
NTX019AA01	RTM	CIVIC SERVICES
NTX020AC01	RTM	VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
NTX021AA04	RTM	REMOTE CALL FORWARDING
NTX023AB03	RTM	REMOTE LINE MODULE (RLM)
NTX024AA01	RTM	RLM INTRA-RLM CALLING
NTX025AA02	RTM	RLM EMERGENCY STAND-ALONE OPERATION
NTX030BA03	RTM	TOPS ACD FEATURES
NTX030CC10	RTM	TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX035AA03	RTM	TOPS REMOTE CAMA
NTX036AA01	RTM	TOPS INWARD VALIDATION
NTX039AA01	RTM	HOST OC DATA - LINK HANDLING
NTX040AA03	RTM	COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC
NTX041AA07	A+M	CCS7 - MTP/SCCP(UPG. BY NTX041AB)
NTX041AB04	RTM	CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX042AA04	RTM	LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
NTX043AA03	RTM	LOCAL CALL DETAIL RECORDING
NTX044AA04	RTM	CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
NTX045AA01	RTM	USAGE SENSITIVE PRICING(USP BELLCORE FORMAT)
NTX048AA04	RTM	SYNCHRONIZATION
NTX048AB01	RTM	SYNCHRONIZATION - CESIUM MASTER CLOCK
NTX048BA02	RTM	SYNCHRONIZATION - STRATUM 3
NTX048CA02	RTM	SYNCHRONIZATION - STRATUM 2
NTX049AC01	RTM	CIRCLE DIGIT IDENTIFICATION
NTX049AD01	RTM	SINGLE PARTY REVERTIVE CALLING
NTX049AE01	RTM	NORTH ELECTRIC ANI FORMAT GENERATION
NTX049AG01	RTM	ITT ANI FORMAT (RECEIPT)
NTX049AH01	RTM	COME AGAIN SIGNALLING
NTX049AL01	RTM	TIME AND TEMPERATURE ANNOUNCEMENT
NTX051AA02	RTM	AUTOMATIC TRUNK TESTING
NTX052AB02	RTM	REMOTE OFFICE TEST LINE (ROTL)
NTX053AA05	RTM	MAINTENANCE ASSISTANCE PACKAGE
NTX054AA05	RTM	LINE TEST POSITION (LTP)
NTX055AA03	RTM	TRUNK TEST POSITION (TTP)
NTX055AB03	RTM	TTP-DIGIT VERIFICATION
NTX055AC02	RTM	TTP-TRANSMISSION MEASUREMENT
NTX055BA01	RTM	RONI TRUNK TESTING
NTX056AA04	RTM	ENHANCED ADMINISTRATION
NTX057AB05	RTM	CUTOVER ASSISTANCE II (NON RESIDENT)
NTX057BA01	RTM	CUTOVER ASSISTANCE III (NON RESIDENT)
NTX057DA01	A+M	CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX057AC)
NTX057EA01	RTM	CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX057DA)
NTX059AB04	RTM	POLLING OM & AUT.MSG ACCTG.DATA VIA DATAPAC(UPG.OF NTX058AD

PEC	Status	Title
NTX060AB10	RTM	NETWORK MANAGEMENT
NTX060BA02	A+M	NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BB)
NTX060BB01	RTM	NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
NTX063AA02	RTM	ECHO SUPPRESSOR
NTX064AA01	RTM	AUTOMATIC LINE INSULATION TESTING (ALIT)
NTX065AA10	RTM	SERVICE ANALYSIS
NTX066AA02	RTM	BILINGUAL INTERFACE
NTX072AA01	RTM	INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
NTX074AA06	RTM	DISK DATA STORAGE SYSTEM
NTX076AA01	RTM	AMA - ENHANCED
NTX077AA01	RTM	ONLINE PERIPHERAL SOFTWARE
NTX080AA02	RTM	LAMA ENHANCED
NTX080BA01	RTM	TERMINATING CALL BILLING(NT FORMAT)
NTX080CA01	A+M	TERMINATING CALL BILLING(ATT FORMAT) (REP.BY NTX083AA)
NTX081AA01	RTM	AMA SPECIAL FORMAT
NTX082AA01	RTM	SUBSCRIBER LINE MEASUREMENTS
NTX083AA01	RTM	FEATURE GROUP A(UPG. OF NTX083AA)
NTX085AA05	RTM	TRAFFIC SEPARATION PEG COUNT
NTX087AA04	RTM	TRAFFIC SEPARATION USAGE
NTX088AA04	RTM	TRAFFIC SEPARATION REPORT
NTX090AA01	RTM	COIN SERVICES
NTX093AA01	RTM	REMOTE/TOLL CALL FORWARDING-TOPS OFFICE
NTX094AA01	RTM	DIGITAL SUBSCRIBER SERVICES
NTX096AA01	RTM	TOPS NOTIS FORMAT
NTX098AA03	RTM	BELLCORE CAMA FORMAT
NTX099AA01	RTM	OPERATIONAL MEASUREMENTS ENHANCEMENTS
NTX100AA20	RTM	INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
NTX101AA13	RTM	IBN - ENHANCED BUSINESS SERVICES
NTX102AA04	RTM	IBN - STATION MESSAGE DETAIL RECORDING
NTX103AA09	RTM	IBN - SMDR ENHANCED
NTX103BA02	RTM	IBN STATION SPECIFIC AUTHORIZATION CODES
NTX105AA03	RTM	TRUNK QUEUING
NTX106AA09	RTM	IBN - PROPRIETARY BUSINESS SET
NTX108AA05	RTM	IBN - DISPLAY FEATURES
NTX110AA01	RTM	IBN - HOSPITAL
NTX111AA03	RTM	IBN - LARGE CONFERENCE
NTX112AB03	RTM	IBN - VIRTUAL FACILITY GROUPS
NTX113AA01	RTM	IBN - AUTOVON INTERFACE
NTX119AA02	RTM	IBN-MESSAGE SERVICE
NTX120AA01	RTM	OFFICE HARDWARE INVENTORY PACKAGE
NTX121AA01	RTM	OVERLAP OUTPUTPULSING (TRK TO TRK)
NTX122AA02	RTM	OM - CALL ATTEMPTS SUMMARY
NTX127AA01	RTM	WARM LINE
NTX129AA02	RTM	TWO WAY OPERATOR OFFICE TRUNK
NTX134BA02	RTM	REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING
NTX136AA03	RTM	AUTOMATIC TRANSMISSION MEASURING SYSTEM
NTX139AA01	RTM	REVERTIVE PULSING ON DIGITAL LINES
NTX140AA02	RTM	TOPS DIAL UP AUTOQUOTE

PEC	Status	Title
NTX141AA01	RTM	TOPS CITY ZONE RATING
NTX142AA01	LTD	DS-1 64 KBPS CLEAR
NTX143AA01	LTD	DS-1 - ESF
NTX145AA05	RTM	REMOTE SWITCHING CENTER
NTX146AA03	RTM	REMOTE LINE CONCENTRATING MODULE (RLCM)
NTX147AB01	RTM	OUTSIDE PLANT MODULE MAINTENANCE(UPGRADE OF NTX147AA)
NTX149AA02	RTM	RSC EMERGENCY STAND ALONE OPERATION - LINES
NTX149AB02	RTM	RSC ESA OPERATION - LINE AND TRUNK
NTX150AA03	RTM	RSC - INTRA RSC CALLING
NTX152AB01	RTM	RSC TRUNKING (UPG. OF NTX152AA)
NTX154AA03	RTM	RLCM - EMERGENCY STAND ALONE OPERATION
NTX156AA02	RTM	INTRA RLCM CALLING
NTX157AA01	RTM	CCIS - INWATS OSO
NTX159AA06	RTM	BELLCORE LAMA FORMAT
NTX160AA01	RTM	MULTIUNIT MESSAGE RATE SERVICES
NTX165AA06	RTM	BELLCORE - IBN/ESN DETAIL RECORDING
NTX167AB04	RTM	CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
NTX170AA01	RTM	CALLING CARD VALIDATION/OPERATOR ASSISTED
NTX171CA02	RTM	MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA/ NTX286BA
NTX172AA01	RTM	MCCS - BILLED NUMBER SCREENING
NTX174AA03	RTM	AIOD(AUTO IDENTIFIED OUTWARD DIALING)
NTX175AA01	RTM	IBN - MULTI BILINGUAL CONSOLE
NTX176AA05	RTM	NON RESIDENT ADMINISTRATIVE AIDS
NTX177AA01	RTM	NON RESIDENT GENERAL UTILITIES
NTX178AA01	RTM	NON RESIDENT DIAGNOSTIC UTILITIES
NTX179AA01	RTM	NON RESIDENT DATA TRANSMISSION SOFTWARE
NTX182AA04	RTM	NON RESIDENT NT COMMISSIONING SOFTWARE
NTX183AA04	RTM	NON RESIDENT NT DATATOOLS SOFTWARE
NTX184AA09	RTM	NON RESIDENT RESTRICTED SOFTWARE LAB USE ONLY
NTX186AA06	RTM	EQUAL ACCESS END OFFICE
NTX187AA03	RTM	TOPS - EQUAL ACCESS
NTX188AA02	RTM	TOPS - BCR AMA FORMAT
NTX190AA01	RTM	FEAT GRP B AMA - TANDEM (NT FORMAT)
NTX192AA01	RTM	4X OPERATION - BELL FORMAT ANI
NTX193AA01	RTM	4X OPERATION - AMR 5 FORMAT ANI
NTX195AA05	RTM	MECHANIZED LOOP TESTER (MLT) I/F
NTX196AA02	RTM	CALLING NUMBER ANNOUNCEMENT (CNA)
NTX197AA01	RTM	CCIS DIRECT SIGNALLING
NTX204AA02	RTM	CCIS BANDED SIGNALLING
NTX206AA01	RTM	UNAUTHORIZED DIGITONE SERVICE DETECTION
NTX207AA01	RTM	LCDR ENHANCED
NTX208AA02	RTM	AUTOMATIC COIN TOLL SERVICE (ACTS)
NTX209AA03	RTM	FEATURE GRP B AMA - END OFFICE (ATT FORMAT)
NTX210AA03	RTM	NO. 2 SCC INTERFACE
NTX211AA02	RTM	FEATURE GRP B AMA - TANDEM (ATT FORMAT)
NTX213AB02	LTD	SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
NTX215AA02	RTM	SES NO.2 - INTERFACE
NTX218AA03	RTM	1A/1B EADAS INTERFACE

PEC	Status	Title
NTX219AB03	RTM	TEEN SERVICE
NTX243AA07	RTM	AMA TELEPROCESSING SYSTEM(AMATPS)
NTX244AA02	A+M	SEQUENTIAL TRUNK SELECTION(REP.BY NTX244AB)
NTX244AB01	RTM	ENHANCED SEQUENTIAL TRUNK HUNTING(UPG OF 244AA IN BCS23)
NTX245AA01	LTD	PUERTO RICO LINE OPTION CONTROL
NTX250AA12	RTM	DATAPATH - BASIC
NTX251AA05	RTM	DATAPATH - MODEM POOLING
NTX259AA03	RTM	DATAPATH EXTENSION - DPX
NTX260AA02	RTM	IBN - PRESET CONFERENCE
NTX262AA01	RTM	IBN PRIORITY CONSOLE ALERTING
NTX268AA02	RTM	FEAT GRP B AMA - END OFFICE (NT FORMAT)
NTX269AA07	RTM	UNIVERSAL TONE RECEIVER(DOMESTIC)
NTX270AA12	RTM	NEW PERIPHERAL MAINTENANCE PACKAGE
NTX272AA02	RTM	FOCUSSED MAINTENANCE
NTX273AA07	RTM	MULTI - PROTOCOL CONTROLLER BX.25
NTX277AA02	RTM	DIALABLE LINE CIRCUIT IDENTIFICATION
NTX286AA01	RTM	MCCS - QUERY VIA OC DATA LINK(ORDER BY MASTER_PKG NTX286BA)
NTX290AA01	RTM	TANDEMING/SUPERVISION AND TREATMENT
NTX291AA04	RTM	ENHANCED REAL TIME INDICATOR
NTX292AB03	RTM	ENHANCED SECURITY - WITH PASSWORD ENCRYPTION
NTX292BA02	RTM	ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
NTX293AA02	RTM	ENHANCED SECURITY PACKAGE II
NTX297AA01	RTM	BRIDGES SERVICES
NTX299AA02	A+M	SPECIAL SERVICES - SCM(UPG BY NTX299AB)
NTX299AB01	RTM	SPECIAL SERVICES - SCM(UPG OF NTX299AA)
NTX380AA02	RTM	DUAL RCC
NTX381AA01	RTM	RSC - REMOTE - OFF REMOTE
NTX385AA01	RTM	OM THRESHOLDING AND ALARMS
NTX386AA03	RTM	ACCESS TANDEM SWITCH
NTX387AA04	RTM	SMU - SUBSCRIBER MODULE URBAN
NTX394AA01	LTD	TOPS - CREDIT CARD DIGIT CHECK
NTX395AA01	RTM	REMOTE MAKE BUZY VIA SCAN POINT
NTX398AA10	RTM	SCM - 100S
NTX399AA01	RTM	IBN/ESB COMPATIBILITY
NTX407AB01	RTM	ACD - CALL PROCESSING (UPGR. OF NTX407AA)
NTX410AA02	RTM	DYNAMIC ATTENDANT CONSOLE MEASUREMENTS
NTX411AA01	RTM	IBN - VOICE MESSAGING
NTX412AA01	RTM	IBN - CUSTOMER STATION CHANGE
NTX412BA01	RTM	IBN - CUSTOMER STATION CHANGE
NTX412CA03	RTM	IBN - CUSTOMER ADMINISTRATION OF DATA
NTX413AA01	RTM	IBN - ENHANCED CALL FORWARDING
NTX414AA01	RTM	IBN - DIRECTED CALL PARK, BUSINESS SET AND 2500 SET
NTX415AA04	RTM	ACD BASIC
NTX416AB02	RTM	ACD ENHANCED II(UPG. OF NTX416AA)
NTX416AC01	LTD	ACD ENHANCED II(UPG. OF NTX416AB)
NTX418AA01	RTM	IBN_SERVICE ANALYSIS
NTX426AA01	RTM	ASYNCHRONOUS INTERFACE LINE CARD

PEC	Status	Title
NTX427AA04	RTM	END USER TESTING OF TRUNKS
NTX430AA02	RTM	ESN
NTX431AA03	RTM	IBN - CUT THROUGH DIALING
NTX432AA01	RTM	NETWORK SPEED CALLING
NTX433AA01	RTM	TIME OF DAY ROUTING
NTX434AA01	RTM	TIME OF DAY NCOS
NTX435AA02	RTM	IBN SUPERSET
NTX436AA01	RTM	IBN ENHANCED DIAL PLAN
NTX437AA01	RTM	RANDOM CONDITIONAL ROUTING
NTX445AB01	RTM	O.M. SELECTIVE OUTPUT (UPGRADE OF NTX445AA)
NTX447AA01	RTO	E911 - TANDEM
NTX455AA01	A+M	1A EADAS NETWORK MANAGEMENT(UPG. BY NTX455AB)
NTX455AB01	RTM	1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
NTX550AA02	RTM	CCS7 - TRANSACTION SERVICE SUPPORT
NTX554AA01	RTM	CCS7 - E800/SSP
NTX560AA03	A+M	NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB)
NTX560AB02	RTM	NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX562AA02	RTM	NOS - DATA COLLECTION
NTX563AA03	RTM	BNM - STATION ADMINISTRATION
NTX571AA01	RTM	IBN - DIRECTED CALL PARK,2500 SET ONLY
NTX573AA01	RTM	IBN SECURITY CODE - 2500 ONLY
NTX574AA01	RTM	IBN SECURITY CODE - 2500 AND BUSINESS SETS
NTX621AA02	RTM	SMU SPECIAL SERVICES
NTX645AA01	RTM	TOPS - SERVICE BILLING
NTX710AA02	RTM	LATA EQUAL ACCESS SYSTEM
NTX711AA02	A+M	EQUAL ACCESS END OFFICE ENHANCEMENTS(UPG.BY NTX711AB)
NTX711AB02	RTM	EQUAL ACCESS END OFFICE ENHANCEMENTS (UPG. OF NTX711AA)
NTX713AA01	RTM	LATA-WIDE CENTREX BILLING
NTX714AA01	RTM	TOPS INTERLATA CARRIER SERVICE
NTX717AB01	RTM	IBN TRK VERIFICATION DESIGNATED STN(UPGR.OF NTX717AA)
NTX719AA01	RTM	BUSINESS SET BUSY INDICATOR
NTX724AA02	RTM	TOPS MP INTERFACE
NTX727AA02	RTM	ACD LOAD MANAGEMENT
NTX727AC01	RTM	ACD LOAD MANAGEMENT II
NTX727AD01	RTM	ACD - LOAD MANAGEMENT III
NTX730AA02	RTM	MULTILINK ASCII DEVICE DRIVER
NTX731AA03	RTM	TOPS MP - TERMINAL HANDLER
NTX732AA02	RTM	SIMPLIFIED MESSAGE DESK INTERFACE(SMDI)
NTX733AA02	A+M	ENHANCED SERVICE ORDER(UPG. BY NTX733AB)
NTX733AB02	A+M	ENHANCED SERVICE ORDER(UPG. BY NTX733AC)
NTX733AC01	RTM	ENHANCED SERVICE ORDER(UPG. OF NTX733AB IN BCS26)
NTX734AA01	RTM	EAE0 - IBN OIC USING SERVORD
NTX735AA01	RTM	FLEXIBLE ANI
NTX737AA01	A+M	FLEXIBLE BELLCORE AMA(UPG.BY NTX737AB)
NTX737AB01	RTM	FLEXIBLE BELLCORE AMA (UPG. OF NTX737AA)
NTX738AA03	RTM	SWITCH PERFORMANCE MONITORING SYSTEM
NTX750AB04	LTD	ISDN BASIC ACCESS(UPG. OF NTX750AA)
NTX753AA02	LTD	ISDN FUNCTIONAL MODE BASIC RATE SERVICES

PEC	Status	Title
NTX790AA03	LTD	ISDN - PRIMARY RATE ACCESS BASE
NTX791AA02	LTD	PRA: NETWORK RING AGAIN
NTX801AA01	RTM	TOLL FEATURES I
NTX802AA04	RTM	TOLL FEATURES II
NTX803AA02	RTM	EQUAL ACCESS ALTERNATE SWITCHING POINT
NTX806AA01	RTM	ENHANCED CALL FORWARDING - POTS
NTX807AA01	A+M	ENHANCED CALL WAITING - POTS(UPG. BY NTX807AB)
NTX807AB01	RTM	ENHANCED CALL WAITING - POTS(UPG. OF NTX807AA)
NTX808AA01	RTM	ENHANCED 3-WAY CALLING - POTS
NTX812AA03	RTM	CENTRALIZED MAP
NTX813AA01	RTM	CENTRALIZED ALARMS
NTX820AA01	RTM	ENHANCED 3-WAY CALLING - IBN
NTX821AA01	RTM	TANDEM OPERATOR SERVICE ROUTING
NTX822AA01	RTM	EBS AS MESSAGE CENTRE
NTX824AA01	A+M	ENHANCED CALL WAITING - IBN(UPG. BY NTX824AB)
NTX824AB01	RTM	ENHANCED CALL WAITING - IBN(UPGR. OF NTX824AA)
NTX825AA02	RTM	EXCHANGE ALTERNATE BILLING SERVICE
NTX827AA02	RTM	NEW PERIPHERALS PERFORMANCE MEASUREMENTS
NTX833AA03	RTM	STP OPERATIONS
NTX834AA01	LTD	DC1S6 TRANSLATIONS
NTX835AA01	RTM	STP - SEAS (1.1) OPERATIONS
NTX839AA01	LTD	STP - ENHANCED MAINTENANACE AND BERT
NTX840AA01	LTD	STP - GATEWAY MESSAGE SCREENING
NTX843AA01	LTD	CELLULAR INTERCONNECT
NTX843AB01	LTD	CELLULAR INTERCONNECT(UPG. OF NTX843AA IN BCS27)
NTX850AA01	RTM	TOPS ALTERNATE ANNOUNCEMENT
NTX851AA01	RTM	SMDR DERIVED FROM BCR AMA
NTX856AA02	RTM	IBN ATTENDANT CONSOLE OM ON AN INDIVIDUAL CONSOLE BASIS
NTX857AA01	RTM	CALL FORWARDING SPECIAL - MDC
NTX871AA01	RTM	REMOTE TOPS MP O.C. DATA LINK HANDLING
NTX873AA01	RTM	HOST TOPS MP O.C. - DATA LINK HANDLING
NTX875AA01	RTM	CCS7 MASS TRUNK CONVERSION
NTX877AA01	LTD	INTERFACE TO NON-DATA LINK CONSOLE
NTX878AB02	RTM	ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF NTX878AA
NTX881AA01	A+M	SWITCH BIT ERROR RATE MAINTENANCE(UPG.BY NTX881AB)
NTX881AB02	A+M	SWITCH BIT ERROR RATE NTCE(REP. BY NTX881AC)
NTX881AC02	RTM	SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB)
NTX882AA03	RTM	BIT ERROR RATIO INDICATOR FOR TOLL SWITCHES
NTX883AA01	RTM	INTER OFFICE TRK BIT ERROR RATE TESTING
NTX885AA02	A+M	SWITCH PATH DIAGNOSTICS (UPG.BY NTX885AB)
NTX885AB01	RTM	SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA)
NTX888AA01	RTM	EAOSS
NTX891AA01	RTM	TOPS - EXCHANGE ACCESS OPR SERV SIG
NTX892AA03	LTD	MPC MULTILINK MANAGEMENT
NTX898AA01	RTM	VARIABLE SPEED CALL ACCESS CODE - IBN
NTX899AA01	RTM	CALL TRANSFER ENHANCEMENTS
NTX901AA17	RTM	LOCAL FEATURES I

PEC	Status	Title
NTX902AA07	RTM	LOCAL FEATURES II
NTX903AA01	RTM	TRANSMISSION MEASUREMENTS
NTX940AA06	RTM	CM BILGE
NTX941AA05	RTM	CM COMMON
NTX942AA04	RTM	DMS - SUPERNODE SYSTEM LOAD MODULE(SLM)
NTX946AA01	A+M	EBS - CALL NAME DISPLAY(UPG. BY NTX946AB)
NTX946AB01	RTM	EBS - CALL NAME DISPLAY(UPG.OF NTX946AA IN BCS26)
NTX983AA01	LTD	SERVICE SWITCHING POINT PRIVATE VIRTUAL NETWORKING
NTX987AA01	LTD	FIBER MAINTENANCE BASIC MODE
NTX989AA01	RTM	CARRIER ACCESS CODE BLOCKING FOR IC/INC
NTX991AA01	A+M	ACD - MANAGEMENT REPORTS 2 WAY DATA STREAM(UPG.BY
		NTX991AB)
NTX991AB02	RTM	ACD-MGMT REP 2 WAY DATA STREAM(UPG OF NTX991AA IN
		BCS26)
NTX992AA01	RTM	ACD MIS

Feature Title	Feat	PEC
(NSG) TRANS. VERIF. DMS-250 IMT. DAL & ONAL TRK GRPS TYPES	F1466	NTX055AB03
A T & T - LAMA FORMAT	F2439	NTX159AA06
A T & T CAMA FORMAT	F2378	NTX098AA03
A T & T CAMA FORMAT	F2378	NTX159AA06
A/C ACTIVATE/DEACTIVATE OF CFU/CFI	F3795	NTX413AA01
A/C ANSWER TIME BY PRECEDENCE	F5633	NTX101AA13
A/C DISPLAY OF QUEUE CALLS BY PRECEDENCE	F5632	NTX101AA13
ABANDONED CALL CLEARING	F5970	NTX407AB01
ABBREVIATED DIALLING IN ESA MODE	F3343	NTX025AA02
ABBT BEYOND METALLIC RANGE FOR RLM	F2376	NTX057AB05
AC EXTENDED CALLS TO CFB/CFD	F5897	NTX100AA20
AC TO IBNISUP INTERWORKING	F7356	NTXA79AA02
AC/DC	F0256	NTX901AA17
ACCESS CHARGE RECORDING - END OFFICE (ATT FORMAT)	F2494	NTX209AA03
ACCESS CHARGE RECORDING - END OFFICE (NT FORMAT)	F2564	NTX268AA02
ACCESS CHARGE RECORDING - TANDEM (ATT FORMAT)	F2496	NTX211AA02
ACCESS CHARGE RECORDING - TANDEM(NT FORMAT)	F2610	NTX190AA01
ACCESS CONTROL	F3336	NTX292AB03
ACCESS CONTROL	F3336	NTX292BA02
ACCESS TO CCSA	F0777	NTX100AA20
ACCESS TO CO FROM PBX	F1161	NTX100AA20
ACCESS TO EPSCS	F1160	NTX100AA20
ACCESS TO ETN	F1264	NTX100AA20
ACCESS TO SPECIAL SERVICE	F1162	NTX100AA20
FACILITIES		
ACCOUNT CODE/ACCEPTANCE AND RECORDING	F0423	NTX103AA09
ACCS ENHANCEMENTS	F6416	NTX825AA02
ACD AGENT AND SUPERVISOR POSITION ID MEMBERS	F6224	NTX416AB02
ACD AGENT AND SUPERVISOR POSITION ID MEMBERS	F6224	NTX416AC01
ACD AGENT LOGIN ENHANCEMENT	F6493	NTX407AB01
ACD AGENT STATUS LAMP	F3981	NTX415AA04
ACD BASE UTILITIES	F5435	NTX407AB01
ACD CALL AGENT FEATURE	F5502	NTX415AA04
ACD CALL FORCING	F3926	NTX416AB02
ACD CALL FORCING	F3926	NTX416AC01
ACD CALLED NAME/NUMBER DISPLAY	G0089	NTX416AC01
ACD CONFIGURATION SECURITY	F6426	NTX727AC01
ACD CONFIGURATION SECURITY	F6426	NTX727AD01
ACD CONFIGURATION SECURITY ENHANCEMENT	F6430	NTX727AD01
ACD DIRECTORY NUMBERS	F3938	NTX407AB01
ACD EMERGENCY KEY	F3927	NTX416AB02
ACD EMERGENCY KEY	F3927	NTX416AC01
ACD EMERGENCY KEY - ENHANCED	F6538	NTX416AB02
ACD EMERGENCY KEY - ENHANCED	F6538	NTX416AC01
ACD EXTENDED AGENT OBSERVE	F5589	NTX416AB02
ACD EXTENDED AGENT OBSERVE	F5589	NTX416AC01
ACD HEADSET	F5864	NTX415AA04
ACD INCALLS KEY	F3923	NTX407AB01

Feature Title	Feat	PEC
ACD LOAD MANAGEMENT - ENHANCED COMMANDS	F6276	NTX727AA02
ACD LOAD MANAGEMENT - ENHANCED COMMANDS	F6276	NTX727AD01
ACD LOAD MANAGEMENT BASIC COMMANDS	F6207	NTX727AA02
ACD LOAD MANAGEMENT BASIC COMMANDS	F6207	NTX727AC01
ACD LOAD MANAGEMENT BASIC COMMANDS	F6207	NTX727AD01
ACD MANAGEMENT INFORMATION SYSTEM INTERFACE	F6431	NTX991AA01
ACD MANAGEMENT INFORMATION SYSTEM INTERFACE	F6431	NTX991AB02
ACD MIS DOWN STREAM PROCESSOR	F6438	NTX992AA01
ACD MIS PROTOCOL SPECIFICATION	F6514	NTX991AB02
ACD MULTI-STAGE QUEUE STATUS LAMP	G0075	NTX416AC01
ACD MUSIC ON DELAY	F3458	NTX101AA13
ACD MUSIC ON DELAY	F3458	NTX407AB01
ACD NOT READY KEY	F3922	NTX407AB01
ACD OBSERVE AGENT KEY	F3928	NTX415AA04
ACD OVERFLOW ENHANCEMENT	F5886	NTX416AB02
ACD OVERFLOW ENHANCEMENT	F5886	NTX416AC01
ACD QUEUE STATUS LAMPS	F5590	NTX416AB02
ACD QUEUE STATUS LAMPS	F5590	NTX416AC01
ACD REAL TIME DISPLAY ENHANCEMENT	F6208	NTX416AB02
ACD REAL TIME DISPLAY ENHANCEMENT	F6208	NTX416AC01
ACD REAL TIME STATUS DISPLAY	F5861	NTX416AB02
ACD REAL TIME STATUS DISPLAY	F5861	NTX416AC01
ACD SHOW	F5862	NTX415AA04
ACD SUPERVISOR CONTROL OF NIGHT SERVICE	F5601	NTX416AB02
ACD SUPERVISOR CONTROL OF NIGHT SERVICE	F5601	NTX416AC01
ACD SUPERVISOR KEY	F3929	NTX416AB02
ACD SUPERVISOR KEY	F3929	NTX416AC01
ACD SYSTEM INTEGRITY	F5848	NTX416AB02
ACD SYSTEM INTEGRITY	F5848	NTX416AC01
ACTS - STANDARD PROM ANNOUNCEMENTS	F5422	NTX208AA02
AGENT COMMUNICATION KEY	F5588	NTX416AB02
AGENT COMMUNICATION KEY	F5588	NTX416AC01
AGENT QUEUE	F5969	NTX407AB01
AGENT STATUS LAMPS	F5614	NTX415AA04
AIOD - CALL PROCESSING	F3730	NTX174AA03
AIOD - DATA STRUCTURES/TABLE CONTROL	F3727	NTX174AA03
AIOD - LOGS & ALARMS	F3732	NTX174AA03
AIOD - MAINTENANCE UTILITIES	F3728	NTX174AA03
AIOD - OPERATIONAL MEASUREMENTS	F3731	NTX174AA03
AIOD - PBX TRUNK & LINE OPTIONS	F3729	NTX174AA03
AIOD FOR TIE TRUNKS	F2780	NTX174AA03
AIOD(AUTO IDENTIFIED OUTWARD DIALING)	F2454	NTX174AA03
ALARM SENDING AND CHECKING	F0621	NTX053AA05
ALARM ENHANCEMENTS FOR SMS	F5948	NTX398AA10
ALARM SENDING AND CHECKING - ADEMCO NO 669	F1306	NTX053AA05
ALARMING ON DCM/RLM LINKS	F6089	NTX001AA21
ALARMS AUDIBLE/VISUAL	F0115	NTX001AA21
ALARMS CARRIER GROUP	F1102	NTX001AA21
ALARMS DEAD OFFICE ALARM	F0116	NTX001AA21
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ALARMS	F0148	NTX001AA21
ALARMS	F0117	NTX001AA21
ALARMS	F0139	NTX001AA21
ALARMS	F0110	NTX001AA21
ALARMS THRESHOLDING OF CRITICAL RESOURCES(MFR,DTR)	F0065	NTX001AA21
ALLOW CHANGES TO OFFICE CONFIGURATION TABLE	F1667	NTX001AA21
ALTERNATE ROUTING	F0030	NTX019AA01
AMA	F0568	NTX042AA04
AMA	F0568	NTX044AA04
AMA FAILURE ROUTING OPTIONS	F2475	NTX030CC10
AMA FAILURE ROUTING OPTIONS	F2475	NTX042AA04
AMA FAILURE ROUTING OPTIONS	F2475	NTX044AA04
AMA FAILURE ROUTING OPTIONS	F2475	NTX102AA04
AMA FOR TOPSMP DA CALLS	F6964	NTX188AA02
AMA PRESERVATION OVER PERIPHERAL WARM SWACT	F5755	NTX001AA21
AMA REAL TIME ENHANCEMENTS(ATT FORMAT)	F3778	NTX001AA21
AMA RECORD OF SPECIFIED UNANSWERED CALL TYPES	F2413	NTX030CC10
AMA RECORD OF TANDEM SWITCH SEIZURE - ONLY CALLS	F2199	NTX044AA04
AMA RECORD ON REMOTE/TOLL CALL FORWARDING	F1239	NTX044AA04
AMA RECORD ON REMOTE/TOLL CALL FORWARDING	F1239	NTX093AA01
AMA TELEPROCESSING SYSTEM(AMATPS)	F2514	NTX243AA07
AMR-5 NORTH ELECTRIC ANI(GENERATION)	F0603	NTX049AE01
ANALOG	F1052	NTX001AA21
ANALOG	F0016	NTX001AA21
ANALOG	F0066	NTX001AA21
ANALOG	F0806	NTX001AA21
ANALOG	F0805	NTX001AA21
ANI (BELL STANDARD) OUTPULSING IN RESPONSE TO A WINK SIGNAL	F2453	NTX901AA17
ANI INFORMATION IN SMDR OUTPUT	G0118	NTX102AA04
ANSWER SUPERVISION TO PBXS FOR TOLL CALLS	F2430	NTX007AB02
ANSWER SUPERVISION TO PBXS FOR TOLL CALLS	F2430	NTX008AB02
ANSWER SUPERVISION TO PBXS FOR TOLL CALLS	F2430	NTX094AA01
AOSS SERVICE ANALYSIS	F3707	NTX065AA10
APPLICATION SUPPORT	F3915	NTX273AA07
ASSIGNABLE GRADE OF SERVICE	F2286	NTX030BA03
ASYNCRONOUS LINE CARD MAINTENANCE	F3873	NTX426AA01
ASYNCRONOUS LINE CARD	F3991	NTX426AA01
AT - OPERATIONAL MEASUREMENTS	F3440	NTX386AA03
AT - TERMINATING BILLING	F1740	NTX386AA03
AT - TRANSLATION AND SCREENING	F3437	NTX386AA03
AT - TREATMEMTS	F3439	NTX386AA03
AT - TRUNKING	F3438	NTX386AA03
ATT - LOG REPORTS	F3441	NTX386AA03
ATT LAMA FORMAT ENHANCEMENT	F1884	NTX159AA06
ATTENDANT ACCESS TO PAGING	F0773	NTX100AA20
ATTENDANT CALL DETAIL ENTRY	F0424	NTX103AA09
ATTENDANT CALL PARK RECALL TIMER	F2525	NTX100AA20
ATTENDANT CALL SELECTION	F0365	NTX100AA20

Feature Title	Feat	PEC
ATTENDANT CAMP-ON	F0366	NTX100AA20
ATTENDANT CONFERENCE (LARGE)	F1631	NTX111AA03
ATTENDANT CONFERENCE (MAXIMUM SIX CONFEREES)	F0367	NTX100AA20
ATTENDANT CONSOLE DISPLAY	F0438	NTX100AA20
ATTENDANT CONSOLE DISPLAY (ENHANCEMENT II)	F1783	NTX100AA20
ATTENDANT CONSOLE DISPLAY (ENHANCEMENT 1)	F1743	NTX100AA20
ATTENDANT CONSOLE END-TO-END SIGNALLING	F2791	NTX101AA13
ATTENDANT CONSOLE MONITOR DISPLAY	F6695	NTX410AA02
ATTENDANT CONSOLE TO ACD	F3930	NTX407AB01
ATTENDANT CONTROL OF TRUNK GROUP ACCESS	F0368	NTX100AA20
ATTENDANT CONTROL OF VFG	F3791	NTX112AB03
ATTENDANT LOCKED LOOP OPERATION	F0369	NTX100AA20
ATTENDANT MESSAGE WAITING	F1625	NTX119AA02
ATTENDANT RELEASE UPON COMPLETION OF DIALING	F1477	NTX100AA20
ATTENDANT SERVICE LOCAL CONSOLE	F0384	NTX100AA20
ATTENDANT SERVICE REMOTE CONSOLE	F0385	NTX100AA20
ATTENDANT SERVICE (CENTRALIZED, CITY WIDE)	F0387	NTX100AA20
ATTENDANT SPEED CALLING	F0370	NTX100AA20
ATTENDANT TO UCD	F5890	NTX101AA13
ATTENDANT TRANSFER	F0772	NTX100AA20
ATTENDANT AUTODIAL	F3411	NTX100AA20
AUDIBLE ALARMS FOR REMOTE CSIDE LINK FAILURES	F6400	NTX270AA12
AUDIO INPUT ON INCOMING CALLS IN QUEUE(ATTND & UCD)	F1215	NTX101AA13
AUDIO TABLE EXPANSION	F6432	NTX100AA20
AUDIT TRAIL	F3337	NTX292AB03
AUDIT TRAIL	F3337	NTX292BA02
AUTHO - CODE CORRECTION	F3931	NTX103AA09
AUTHORIZATION CODE IMMEDIATE DIALLING	F2524	NTX103AA09
AUTHORIZATION CODES	F1751	NTX103AA09
AUTHORIZATION CODES VERIFICATION AND RECORDING	F0759	NTX103AA09
AUTO BUSY OUT OF FAULTY SUB-UNIT	F0118	NTX001AA21
AUTO RETEST OF ALT FEATURES	F5429	NTX054AA05
AUTOMATIC ALTERNATE ROUTING	F1608	NTX001AA21
AUTOMATIC BOARD TO BOARD TEST - AUTO TEL AND ELECTRIC CO.	F1291	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST - S.C. XY	F0852	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST - SA-1	F1292	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST - SP-1	F1121	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -#1 ESS	F1120	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (DP)	F1119	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (MF)	F2271	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -A.E. SXS	F0666	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -C1EAX	F0661	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -MOTOR SWITCH OFFICE	F2317	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -NT SXS	F0665	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -NXID	F2170	NTX057AB05
AUTOMATIC BOARD TO BOARD TEST -W.E. NO.1 SXS	F0664	NTX057AB05
AUTOMATIC BOARD TO BOARD TESTING	F1307	NTX057AB05

Feature Title	Feat	PEC
AUTOMATIC BOARD TO BOARD TESTING SPEED-UP	F2510	NTX057BA01
AUTOMATIC BUSY OUT OF TRUNKS UPON INTEGRITY CHECK FAILURE	F2588	NTX001AA21
AUTOMATIC CALL GAPPING	F7062	NTX825AA02
AUTOMATIC CALL SET-UP	F6661	NTXA00AA02
AUTOMATIC COIN TOLL SERVICE (ACTS)	F2489	NTX208AA02
AUTOMATIC COIN TOLL SERVICE PHASE I	F3968	NTX208AA02
AUTOMATIC COLLECT	F0951	NTX030CC10
AUTOMATIC COLLECTION OF DEPOSIT ON RELEASE	F0972	NTX030CC10
AUTOMATIC DIAL BACK	F3338	NTX293AA02
AUTOMATIC IMAGE DUMP	F7117	NTX074AA06
AUTOMATIC INTERCEPT SERVICE (OUTPULSED CALLED NUMBER)	F2070	NTX001AA21
AUTOMATIC LINE	F1172	NTX100AA20
AUTOMATIC LINE (DATA LINE/HOT LINE)	F0344	NTX006AA04
AUTOMATIC LINE AND MADN	F2805	NTX106AA09
AUTOMATIC LINE INSULATION TESTING (ALIT)	F0687	NTX064AA01
AUTOMATIC LINE TEST COMMISSIONING	F1719	NTX182AA04
AUTOMATIC LINE TESTING	F0632	NTX054AA05
AUTOMATIC LINE TESTING - SPEED UP	F2511	NTX901AA17
AUTOMATIC LINE TESTING REWRITE	F6598	NTX901AA17
AUTOMATIC LOGOUT OF DIAL-UP LINES	F3339	NTX292AB03
AUTOMATIC LOGOUT OF DIAL-UP LINES	F3339	NTX292BA02
AUTOMATIC NO AMA	F0955	NTX030CC10
AUTOMATIC OUT-OF-CHAIN ROUTING (AOOCR)	F0671	NTX060BA02
AUTOMATIC OUT-OF-CHAIN ROUTING (AOOCR)	F0671	NTX060BB01
AUTOMATIC OVERFLOW	F5967	NTX407AB01
AUTOMATIC POLLING OM DATA VIA DATAPAC	F1065	NTX059AB04
AUTOMATIC RECALL	F0371	NTX100AA20
AUTOMATIC RETEST OF ALT FAILURES	F5410	NTX901AA17
AUTOMATIC ROTATION OF STORAGE DEVICE	F1114	NTX042AA04
AUTOMATIC ROTATION OF STORAGE DEVICE	F1114	NTX044AA04
AUTOMATIC ROUTE SELECTION	F1188	NTX105AA03
AUTOMATIC SYSTEM TEST FOR RCU	F6573	NTX387AA04
AUTOMATIC TROUBLE DIAGNOSTIC AND STANDBY SWITCHING	F0140	NTX001AA21
AUTOMATIC TRUNK TESTING FOR ORIGINATING TEST TYPES	F0616	NTX051AA02
AUTOMATIC TRUNK TESTING REPORT	F3978	NTX562AA02
AUTOQUOTE PRINTERS	F0551	NTX030CC10
BABBLING IDIOT ENHANCEMENTS	F5873	NTX001AA21
BABBLING LINE HANDLER	F5931	NTX001AA21
BASIC BERT	F6151	NTX250AA12
BASIC DATA MODIFICATION SYSTEMCOMMAND EDITING	F0077	NTX001AA21
BASIC DATA MODIFICATION SYSTEMDATA VALIDITY CHECKS	F0011	NTX001AA21
BASIC DATA MODIFICATION SYSTEMDEFAULT FOR CONSEC	F0837	NTX001AA21
BASIC DATA MODIFICATION SYSTEMEMERGENCY ACTIVATION	F0836	NTX001AA21
BASIC DATA MODIFICATION SYSTEMPROMPTED & UNPROMPTED INPUT	F0080	NTX001AA21
BASIC DATA MODIFICATION SYSTEMTRUNK DATA BASE QUERIES	F0835	NTX001AA21

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Feature Title	Feat	PEC
BASIC DMO SYSTEM(ADD,DEL,MOD) DIRECTORY NUMBERS (DN)	F0123	NTX001AA21
BASIC DMO SYSTEM(ADD,DEL,MOD) FEATURES	F0078	NTX001AA21
BASIC DMO SYSTEM(ADD,DEL,MOD) LINE EQUIPMENT NO. (LEN)	F0079	NTX001AA21
BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRANSLATION	F0082	NTX001AA21
BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRUNK GROUPS	F0083	NTX001AA21
BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRUNKS	F0084	NTX001AA21
BASIC DMO SYSTEM(ADD,DEL,MOD) SERVICES	F0081	NTX001AA21
BASIC I/O INTERFACE	F1196	NTX001AA21
BASIC OPERATIONAL MEASUREMENT - CALL DISPOSITION SUMMARY	F2345	NTX122AA02
BASIC OPERATIONAL MEASUREMENT - INEFFECTIVE MACHINE ATTEMPTS	F2446	NTX122AA02
BASIC OPERATIONAL MEASUREMENT-ACH CCH REGISTERS	F2159	NTX053AA05
BASIC OPERATIONAL MEASUREMENT-MAN-MADE BUSY USAGE	F0813	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-RCVR ATT-MENT DELAY REPORTS	F0313	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-SELECTIVE PRINTOUT	F0093	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-SYS CALLED DIAGNOSTIC PEG CNTS	F0816	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-SYSETM DETECTED ERROR PEG CNTS	F0815	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-SYSTEM MADE BUSY USAGE	F0814	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-SYSTEM DIAGNOSED H/W FAULTS	F0812	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-BLOCK CALLS	F0818	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-MATCH LOSS	F0817	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-PEG COUNTS	F0820	NTX001AA21
BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-USAGE	F0819	NTX001AA21
BASIC TRANSLATION AND ROUTING	F0722	NTX023AB03
BC AMA INTERLATER WATS CALL CODE III	F5684	NTX098AA03
BC AMA INTERLATER WATS CALL CODE III	F5684	NTX159AA06
BCD RECORDING	F1198	NTX042AA04
BCD RECORDING	F1198	NTX044AA04
BCS12 ENHANCEMENTS	F1486	NTX901AA17
BCS22 COMMISSIONING NONRES S/W UPDATES	F6477	NTX182AA04
BCS24 COMMISSIONING NONRES S/W UPDATES	F6626	NTX182AA04
BEARER CAPABILITY FOR ISDN	F6144	NTX750AB04
BELL SYSTEM STANDARD SIGNALLING FORMAT	F1015	NTX030CC10
BELL(U.S.) AMA FORMAT COMPATIBILITY	F2634	NTX188AA02
BELL(U.S.) STANDARD ANNOUNCEMENTS VIA PROM	F2566	NTX001AA21
BELLCORE AMA - ENHANCED ARS TRANSLATIONS	G0034	NTX165AA06
BELLCORE AMA CALL CODES 085 AND 011	F5504	NTX165AA06
BERMUDA SPECIAL SERVICE CODES (9XX)	F2457	NTX001AA21
BERT FOR ISDN BASIC ACCESS LOOPS	F6532	NTX750AB04
BERT FOR TRUNKS	F6560	NTX883AA01
BETTER CC INTERPRPETATION OF MESSAGING FAILURES	F6603	NTX270AA12

Feature Title	Feat	PEC
BILINGUAL INTERFACE	F0691	NTX066AA02
BILLED NUMBER SCREENING	F1603	NTX172AA01
BILLED NUMBER SCREENING	F1603	NTX825AA02
BILLING ON TERMINATING CALLS TO A LINE	F2520	NTX080BA01
BILLING ON TERMINATING CALLS TO A LINE	F2520	NTX080CA01
BILLING ON TERMINATING CALLS TO A LINE	F2520	NTX083AA01
BUSINESS SET LISTEN ON HOLD	F1810	NTX106AA09
BIT ERROR RATE PERFORMANCE COVERAGE ENHANCEMENTS	F6963	NTX881AC02
BLIND TRANSFER RECALL	F7094	NTX100AA20
BLIND TRANSFER RECALL IDENTIFICATION	F7140	NTX100AA20
BLUE BOX FRAUD PREVENTIONN	F0184	NTX044AA04
BNM CUSTOMER DATA UPLOAD ENHANCEMENT	F7171	NTX563AA03
BNM-DMS UPLOAD SUPPORT FOR ISDN STATION DATA	F7397	NTX563AA03
BNR - AMA/CDR TAPE DUMP UTILITY PROG (AMATAPE)	F1044	NTX178AA01
BNR - AMA/CDR TAPE DUMP UTILITY PROG (AMATAPE)	F1044	NTX182AA04
BOC - AMA CALL CODE 032	F3959	NTX165AA06
BRIDGED AND GROUNDED RINGERS ON SAME LINE	F0165	NTX901AA17
BRIDGED RINGING	F0020	NTX901AA17
BUFFER MANAGEMENT SYSTEM	F6967	NTX833AA03
BUILT-IN TROUBLE SHOOT DIAG PROG TO ID ALL FAULTY SUB- UNITS	F0840	NTX001AA21
BULK DMO	F0654	NTX056AA04
BUREAU FORCED DISCONNECT	F0752	NTX019AA01
BUREAU TO TRUNK INTEGRITY CHECK	F0754	NTX019AA01
BUSINESS SET - 36 BUTTON ADD ON SUPPORT	F2864	NTX106AA09
BUSINESS SET ADD ON MODULE SOFTWARE	F1833	NTX106AA09
BUSINESS SET ADDONS & EXTN FACILITIES MAINTENANCE	F3735	NTX106AA09
BUSINESS SET AUTO ANSWER BACK	F1826	NTX106AA09
BUSINESS SET AUTOMATIC LINE	F3453	NTX106AA09
BUSINESS SET AUTOMATIC LINES	F1818	NTX106AA09
BUSINESS SET BUSY INDICATOR	F2863	NTX719AA01
BUSINESS SET BUSY OVERRIDE	F1848	NTX106AA09
BUSINESS SET CALL BACK QUEUING	F3388	NTX106AA09
BUSINESS SET CALL FORWARD ALL CALLS KEY S/W	F1815	NTX106AA09
BUSINESS SET CALL PARK	F1830	NTX106AA09
BUSINESS SET CALL PICKUP FEATURE KEY S/W	F1816	NTX106AA09
BUSINESS SET CALL WAITING	F1807	NTX106AA09
BUSINESS SET DISPLAY CALLED NUMBER	F1838	NTX108AA05
BUSINESS SET END TO END SIGNALLING	F1808	NTX106AA09
BUSINESS SET EXTENSION SETS	F3389	NTX106AA09
BUSINESS SET FEATURE DISPLAY	F3410	NTX108AA05
BUSINESS SET GROUP INTERCOM	F3452	NTX106AA09
BUSINESS SET HELD CALLS	F1820	NTX106AA09
BUSINESS SET IBN BASIC CALLS	F1821	NTX106AA09
BUSINESS SET INDIVIDUAL BUSINESS LINE	F1834	NTX106AA09
BUSINESS SET INTERCOM	F1829	NTX106AA09
BUSINESS SET MADN MCA	F1832	NTX106AA09
BUSINESS SET MADN SCA (ACCESS SWITCH)	F1819	NTX106AA09
BUSINESS SET MAKE SET BUSY	F1828	NTX106AA09

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BUSINESS SET MALICIOUS CALL HOLD	F1835	NTX106AA09
BUSINESS SET ON HOOK DIALING	F1812	NTX106AA09
BUSINESS SET POTS BASIC CALLS	F1823	NTX106AA09
BUSINESS SET PRIVACY RELEASE (ACROSS SWITCH)	F1837	NTX106AA09
BUSINESS SET QUERY TIME KEY	F1841	NTX108AA05
BUSINESS SET RING AGAIN FEATURE KEY S/W	F1813	NTX106AA09
BUSINESS SET SERVICE ORDER SYSTEM	F1817	NTX106AA09
BUSINESS SET SPEED CALLING FEATURE KEY S/W	F1814	NTX106AA09
BUSINESS SET 3W CALLING / XFER	F1809	NTX106AA09
BUSINESS SET 6 PORT CONFERENCE	F1827	NTX106AA09
BUSY LINE VERIFY AVERAGE WORK TIME (AWT) ENHANCEMENTS	G0057	NTXA28AA02
BUSY OUT/IDLE EQUIPMENT	F0119	NTX001AA21
BUSY VERIFICATION - STATIONS	F1173	NTX100AA20
BUSY VERIFICATION -TRUNKS	F0771	NTX100AA20
CALL BACK QUEING	F1627	NTX105AA03
CALL BACK QUEUING ENHANCED	F1231	NTX105AA03
CALL CODE 009,003 & 121 ASSIGNMENT VIA TRANSLATION	F2759	NTX098AA03
CALL CODE 009,003 & 121 ASSIGNMENT VIA TRANSLATION	F2759	NTX159AA06
CALL DELAY ANNOUNCEMENT	F5965	NTX407AB01
CALL FORWARD ALL CALLS	F0410	NTX100AA20
CALL FORWARD BUSY	F0411	NTX100AA20
CALL FORWARD NO ANSWER	F0412	NTX100AA20
CALL FORWARD BUSY/DON'T ANSWER-INTERNAL/EXTERNAL SPLIT	G0127	NTXE39AA01
CALL FORWARD DESTINATION DISPLAY	F2851	NTX108AA05
CALL FORWARD REASON DISPLAY	F6334	NTX108AA05
CALL FORWARD REMOTE ACTIVATION	F2781	NTXA43AA01
CALL FORWARDING (7/10 DIGITS)	F2232	NTX020AC01
CALL FORWARDING - BUSY LINE (CFBL)	F2801	NTX806AA01
CALL FORWARDING - NO ANSWER (CFNA)	F2802	NTX806AA01
CALL FORWARDING - USAGE SENSITIVE PRICING(BELLCORE FORMAT)	F2777	NTX045AA01
CALL FWD ASGNMT TO PBX MESS RATE LINE (CFW FOR PBM)	F2935	NTX901AA17
CALL HOLD	F0374	NTX100AA20
CALL HOLD	F3485	NTX435AA02
CALL HOLD ON MALICIOUS CALL TRACE - POTS LINES	F0278	NTX902AA07
CALL PARK	F1297	NTX100AA20
CALL PARK RECALL IDENTIFICATION	F2967	NTX878AB02
CALL PICKUP	F0413	NTX100AA20
CALL PROCESSING ROBUSTNESS	F3962	NTX001AA21
CALL SOURCE ID	F1839	NTX108AA05
CALL SOURCE ID	F1839	NTX407AB01
CALL TIMING OFFICE PARAMETER REVISION	F3813	NTX001AA21
CALL TRACING (OFFICE PATH TRACE)	F0120	NTX053AA05
CALL WAITING	F1020	NTX020AC01
CALL WAITING	F0451	NTX100AA20
CALL WAITING - ORIGINATING	F3486	NTX435AA02
CALL WAITING AND 3WC INTERACTION	G0021	NTX100AA20
CALL WAITING FOR 3-WAY CALLING	F2810	NTX807AB01
CALL WAITING FOR 3-WAY CALLING	F2810	NTX824AB01

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CALL WAITING ORIGINATION FOR EBS	F7200	NTX106AA09
CALLED PARTY HOLD ON CALLS TO PBX	F2502	NTX007AB02
CALLED PARTY HOLD ON CALLS TO PBX	F2502	NTX008AB02
CALLED PARTY HOLD ON CALLS TO PBX	F2502	NTX094AA01
CALLING NAME DISPLAY	G0011	NTX946AA01
CALLING NAME DISPLAY	G0011	NTX946AB01
CALLING NUMBER AND NCOS DISPLAY ON ATTENDANT	F6595	NTXA39AA01
CALLING NUMBER ANNOUNCEMENT (CNA)	F2468	NTX196AA02
CALLING NUMBER DELIVERY	F6688	NTXA01AA01
CALLING NUMBER DELIVERY BLOCKING	F6662	NTXA41AA01
CALLS ROUTED TO RECORDING THEN OPERATOR	F0287	NTX902AA07
CAMA SUPERVISION ANSWER TIMING	F0580	NTX044AA04
CAMA SUPERVISION CALLED DISCONNECT TIMING	F0581	NTX044AA04
CAMA SUSPENSION	F0966	NTX030CC10
CANCEL AND SKIP CONTROLS	F6029	NTX060AB10
CANCEL CALL WAITING - POTS	F2711	NTX807AA01
CANCEL CALL WAITING - POTS	F2711	NTX807AB01
CAPABILITY (1.1)	F6976	NTX835AA01
CARRIER ACCESS CODE BLOCKING FOR IC/INC	F2909	NTX989AA01
CARRIER CODE ON AMA FOR TERMINATING TOPS CALLS	G0029	NTX187AA03
CARRIER ENHANCEMENTS	F3815	NTX001AA21
CC BOOT LOADER FIRMWARE ENHANCEMENT	F3960	NTX001AA21
CC ESA STATIC DATA	F6575	NTX380AA02
CC GENERAL PURPOSE RO IMPLEMENTATION	F5956	NTX560AA03
CC GENERAL PURPOSE RO IMPLEMENTATION	F5956	NTX560AB02
CC INTERSWITCHING	F6467	NTX380AA02
CC MANUAL SUPPORT FOR DEAD SYSTEM RECOVERY	F7228	NTX270AA12
CC SOFTWARE FOR XPM SPECIAL CONNECTIONS	F6149	NTX750AB04
CC SUPPORT FOR DTU	F6351	NTX001AA21
CC SUPPORT FOR NT6X50AA	F6506	NTX270AA12
CC SUPPORT FOR THE DUAQ MODEMS	F5551	NTX140AA02
CCIS DIRECT SIGNALLING	F0560	NTX197AA01
CCIS - BANDED SIGNALLING	F1245	NTX204AA02
CCIS - BASIC MAINTENANCE	F3154	NTX204AA02
CCIS - DATA EXTRACTION/INSERTION	F3153	NTX040AA03
CCIS - INWATS OSO	F2435	NTX157AA01
CCIS - SIGNALLING TERMINAL	F1793	NTX040AA03
CCIS - TOPS INTERWORKING	F1246	NTX040AA03
CCIS - TRUNK FROM LINE CP	F3152	NTX204AA02
CCIS - TRUNK TO LINE CP	F3151	NTX204AA02
CCIS6 - CCS LINE INTERWORKING	F1748	NTX204AA02
CCSA AMA RECORDING - TRUNK GRP TYPE	F3781	NTX100AA20
CCSA LINE OPTION	F2746	NTX165AA06
CCSA VFG OPTION	F2747	NTX165AA06
CCS7 - MSB COMMISSIONING LOAD	F3998	NTX041AA07
CCS7 - MSB COMMISSIONING LOAD	F3998	NTX041AB04
CCS7 - SIGNALING TERMINAL	F5510	NTX041AA07
CCS7 - SIGNALING TERMINAL	F5510	NTX041AB04
CCS7 BASE	F5791	NTX041AA07

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CCS7 BASE	F5791	NTX041AB04
CCS7 BCS INSERTION	F6214	NTX041AA07
CCS7 BCS INSERTION	F6214	NTX041AB04
CCS7 INDN USER PART	F5670	NTX167AB04
CCS7 LINK SET MGMT	F5667	NTX041AA07
CCS7 LINK SET MGMT	F5667	NTX041AB04
CCS7 ROUTE SET MGMT	F5668	NTX041AA07
CCS7 ROUTE SET MGMT	F5668	NTX041AB04
CCS7 ST COMMISSIONING LOAD	F3997	NTX041AA07
CCS7 ST COMMISSIONING LOAD	F3997	NTX041AB04
CCS7-CALL PROGRESS/COMFORT TONE	G0035	NTXA15AA01
CENTRALIZED ALARMS	F6098	NTX813AA01
CENTRALIZED MAP DMS ENHANCEMENTS	F6222	NTX812AA03
CESIUM MASTER CLOCK INTERFACE	F0591	NTX048AB01
CHANGE COMMAND CLASSES QUERY	F1729	NTX183AA04
CHANGE LINE CLASS CODES VIA SERVORD	G0039	NTX733AB02
CHANGE LINE CLASS CODES VIA SERVORD	G0039	NTX733AC01
CHANGE LINE TREATMENT GROUP	F7202	NTX901AA17
CHANGED TRUNK GROUP RECORDING ABILITY	F6346	NTX455AB01
CHARGE - A - CALL (COIN FREE DIALING)	F2427	NTX901AA17
CIRCLE DIGIT EQUAL ACCESS COMPATIBILITY	F5683	NTX186AA06
CIRCLE DIGIT IDENTIFICATION	F0604	NTX049AC01
CIRCUIT LOCATE LINE	F0007	NTX053AA05
CIRCUIT LOCATE TRUNKS	F0008	NTX053AA05
CIRCUIT MONITOR	F0639	NTX055AB03
CIRCULAR TRUNK HUNTING	F2900	NTX244AB01
CITY ZONE RATING	F2429	NTX141AA01
CLASS CMR FIRMWARE(C-SIDE INTERFACE)	F6690	NTXA01AA01
CLASS CMR FIRMWARE(DIAGNOSTICS)	F6689	NTXA01AA01
CLASS CMR FIRMWARE(OVERVIEW)	F6691	NTXA01AA01
CLASS OF SERVICE RESTRICTIONS FULLY RESTRICTED SERVICE	F0388	NTX100AA20
CLASS OF SERVICE RESTRICTIONS SEMI-RESTRICTED SERVICE	F0389	NTX100AA20
CLASS OF SERVICE RESTRICTIONS TOLL RESTRICTED SERVICE	F0787	NTX100AA20
CLASS OF SERVICE RESTRICTIONS UNRESTRICTED SERVICE	F0390	NTX100AA20
CLASS OF SERVICE TONE	F1104	NTX030CC10
CLASS OF SERVICE TONES	F0145	NTX901AA17
CLASS 1 TO 5 SWITCHING	F0839	NTX001AA21
CLASS 5 IBN INWATS	F2359	NTX112AB03
CLASS 5 IBN OUTWATS	F1234	NTX112AB03
CLASS: AUTO CALL BACK AUTO RECALL ENHANCEMENTS	F7232	NTXA00AA02
CLASS: CALL MEMORY ENHANCEMENTS	F7236	NTXA82AA02
CLASS: CALLING NUMBER DELIVERY BLOCKING ENHANCEMENTS	F7237	NTXA41AA01
CLASS: CMR FACILITY MAINTENANCE	F7240	NTXA01AA01
CLASS: CMR FIREWARE(CALLING NUMBER DELIVERY)	F7231	NTXA01AA01
CLASS: CUSTOMER ORIGINATED TRACE ENHANCEMENTS	F7235	NTXA02AA02
CLASS: INC/OTG MEMORY SLOT CALL PROCESSING	F6687	NTXA82AA02
CLASS: LINE AND OFFICE DATA	F6660	NTXA82AA02
CLASS: MODEM CARD MAINTENANCE	F6692	NTXA01AA01
CLASS: USAGE SENSITIVE PRICING BILLING	F7411	NTXA82AA02

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CLEAR CHANNEL 64 KB/S SIGNALLING	F6359	NTX142AA01
CLEN FOR EBS	F2926	NTX733AA02
CLEN FOR EBS	F2926	NTX733AB02
CLEN FOR EBS	F2926	NTX733AC01
CLG PARTY SWITCH HOOK STATUS AC SIGNALLING	F0753	NTX019AA01
CLG PARTY SWITCH HOOK STATUS DC SIGNALLING	F2295	NTX019AA01
CLI - LINE TERMINATION	F0279	NTX902AA07
CLI - TRUNK TERMINATION	F2320	NTX801AA01
CLI - TRUNK TERMINATION	F2320	NTX901AA17
CLLI ENHANCMENTS BCS APPL SPEEDUP	F3964	NTX001AA21
CLOSE LOGS TO SCCS AFTER RESTARTS	F2875	NTX001AA21
CM REXTEST ENHANCEMENTS	F7066	NTX940AA06
CNA ENHANCEMENTS	F2688	NTX196AA02
COD OPTION ON OFFICE BASIS	F2653	NTX901AA17
CODE CALL ACCESS	F0391	NTX100AA20
CODE CONTROL - EQUAL ACCESS	F1738	NTX060BA02
CODE CONTROL - EQUAL ACCESS	F1738	NTX060BB01
CODE CONTROLS CODE POINT BLOCKING 3-10 DIGIT	F0317	NTX060AB10
CODE RED/CODE BLUE	F1630	NTX110AA01
CODE RESTRICTIONS	F0776	NTX100AA20
CODE RING (5 CODES)	F0257	NTX901AA17
COIN CONTROL + OR - 130V TO COIN STATION	F0188	NTX901AA17
COIN CONTROL INBAND SIGNALLING (AC)	F0189	NTX901AA17
COIN CONTROL LINE NUMBER METHOD	F2312	NTX802AA04
COIN CONTROL LINE NUMBER METHOD	F2152	NTX901AA17
COIN CONTROL MULTIWINK	F0190	NTX901AA17
COIN CONTROL THIRD WIRE	F0193	NTX901AA17
COIN CONTROL TIP AND RING	F0194	NTX901AA17
COIN CONTROL CAPABILITY ON SC TRK GROUPS	F2395	NTX192AA01
COIN CONTROL CAPABILITY ON SC TRK GROUPS	F2395	NTX193AA01
COIN CONTROL METHOD INBAND	F0978	NTX030CC10
COIN CONTROL METHOD LINE NUMBER	F0977	NTX030CC10
COIN CONTROL METHOD MULTIWINK	F0980	NTX030CC10
COIN DISPOSAL SIGNAL POLARITY OPTION	F5747	NTX901AA17
COIN FEATURES - A T & T DTF	F2437	NTX901AA17
COIN FIRST-RETURN ON DISCONNECT	F2918	NTX030CC10
COIN STUCK & COIN PRESENT/ABSENT DETECTION	F0167	NTX901AA17
COIN 1+, 0+, 0-	F0932	NTX030CC10
COINLESS PAY PHONE WITH INFO DIGIT 7	F2284	NTX902AA07
COLLECT	F1108	NTX030CC10
COMBINED MF TRUNK GROUPS (1+,0+,0-,COIN,NON-COIN)	F0829	NTX802AA04
COMBINED MF TRUNK GROUPS (1+,0+,0-,COIN,NON-COIN)	F0829	NTX902AA07
COMBINED VERIFICATION AND TOLL COMPLETING	F0332	NTX802AA04
COMBINED VERIFICATION AND TOLL COMPLETING	F0332	NTX902AA07
COME AGAIN SIGNALLING	F0607	NTX049AH01
COMMAND SCREENING	F1680	NTX177AA01
COMMISSIONING LINE DIAGNOSTIC	F1665	NTX182AA04

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COMMISSIONING S/W UNLOAD VERIFICATION	F1720	NTX182AA04
COMPATIBILITY OF LCDR OPTION ON CDF AND CCF COIN LINES	F2758	NTX043AA03
COMPATIBILITY WITH: CAROT	F0737	NTX052AB02
COMPATIBILITY WITH: RAMPART	F0738	NTX052AB02
CONFERENCE CIRUCIT (3/6 PORT) DIAGNOSTIC ENHANCEMENT	G0060	NTX001AA21
CONFIDENTIALITY ALERTING ON CALL TRANSFER	F2970	NTX899AA01
CONSOLE TEST	F1642	NTX100AA20
CONSULTATION HOLD	F0848	NTX100AA20
CONVERSION OF NOS FILE TRANSFER TO GENERIC RO SERVICE	F6235	NTX562AA02
CORRIDOR 611 ROUTING AND BILLING	F5566	NTX186AA06
COUNTRY CODE BLOCKING	F1768	NTX060AB10
COUNTRY CODE SCREENING (U.S)	F1030	NTX072AA01
CPU CAPACITY ENHANCEMENT (40 MHZ CPU)	F5449	NTX001AA21
CPU DIAGNOSTIC IMPROVEMENTS	F5870	NTX001AA21
CREDIT CARD	F1111	NTX030CC10
CREDIT REQUEST	F0956	NTX030CC10
CRITICAL MESSAGE PRIORITIZATION	F2536	NTX001AA21
CUG FOR THE US MARKET	F2996	NTXE60AA01
CURRENT OCCUPANCY STATUS	F0915	NTX184AA09
CUSTOM CALLING - 4 SECOND DELAY CANCELLATION	F2589	NTX020AC01
CUSTOMER DIALED ACCOUNT RECORDING	F5617	NTX165AA06
CUSTOMER GROUP TRANSPARENCY	F2682	NTX100AA20
CUSTOMER MANIPULATION OF TRUNK GROUP ROUTE LISTS	F3844	NTX412CA03
CUSTOMER NETWORK DATA CHANGES	F3847	NTX412BA01
CUSTOMER NETWORK DATA CHANGES	F3847	NTX412CA03
CUSTOMER ORIGINATED TRACE	F6659	NTXA02AA02
CUSTOMER SCREENING AT THE TTP	F3907	NTX427AA04
CUSTOMER SERVICE CHANGE VIA SERVORD	F3784	NTX412AA01
CUSTOMER SERVICE CHANGE VIA SERVORD	F3784	NTX412BA01
CUSTOMER SERVICE CHANGE VIA SERVORD	F3784	NTX412CA03
CUT THROUGH DIALING FOR IBN LINES AND A/C	F3792	NTX431AA03
CUT THROUGH DIALLING	F1623	NTX431AA03
CUTOVER OF WORKING T1 LINES USING NAILED UP CONNECTIONS	F0667	NTX057DA01
CUTOVER OF WORKING T1 LINES USING NAILED UP CONNECTIONS	F0667	NTX057EA01
DA APPLICATION	F7078	NTXA91AA01
DATA DISTRIBUTOR	F6615	NTX056AA04
DATA CALL ID ON SMDR	F6686	NTX250AA12
DATA CALL PROTECTION	F0393	NTX100AA20
DATA DICTIONARY DUMP	F0903	NTX176AA05
DATA DUMP AND RESTORE	F1666	NTX183AA04
DATA FACILITES FOR 3X09MTA	F3434	NTX901AA17
DATA MANAGER ROBUSTNESS	F7253	NTX041AB04
DATA RECORDING AND RECALL AUTOMATIC MESSAGE	F1132	NTX074AA06
ACCOUNTING		
DATA RECORDING AND RECALL JOURNAL FILE	F1134	NTX074AA06
DATA RECORDING AND RECALL LOG FILE	F1133	NTX074AA06
DATA RECORDING AND RECALL OPERATIONAL MEASUREMENTS	F1131	NTX074AA06
DATABASE DUMP	F0898	NTX176AA05
DATABASE DUMP	F0898	NTX182AA04

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DATABASE REPORTING	F5995	NTX710AA02
DATABASE SYSTEM ENHANCEMENTS	F5994	NTX710AA02
DATAPAC POLLING AND RESTRUCTURE	F5437	NTX059AB04
DATAPATH - AUTOMATIC LINE	F3164	NTX250AA12
DATAPATH - CALL PROCESSING	F3161	NTX250AA12
DATAPATH - CALL PROGRESS SIGNAL INDICATION	F5503	NTX250AA12
DATAPATH - DATA LINE CARD	F3172	NTX250AA12
DATAPATH - DU/DLC BPV COUNT	F3169	NTX250AA12
DATAPATH - ESN DIGITAL DATA CONNECTIVITY	F3166	NTX250AA12
DATAPATH - HIGH SPEED DATA UNIT	F1259	NTX250AA12
DATAPATH - HUNT GROUPS	F3165	NTX250AA12
DATAPATH - LOOP TESTING	F3157	NTX250AA12
DATAPATH - RING AGAIN	F3167	NTX250AA12
DATAPATH - SERVICE ORDERS	F3160	NTX250AA12
DATAPATH - SPEED CALLING	F3163	NTX250AA12
DATAPATH AMA FORMAT-CALL CODES 072,117,121	F2793	NTX098AA03
DATAPATH AMA FORMAT-CALL CODES 072,117,121	F2793	NTX159AA06
DATAPATH COAX ELIMINATION FOR IBM 3194 TERMINALS	G0049	NTX250AA12
DATAPATH DISCONNECT TIMEOUT	F3897	NTX250AA12
DATAPATH DU PROFILE	F3759	NTX250AA12
DATAPATH D4 DPX FIRMWARE	F6314	NTX259AA03
DATAPATH D4 DPX MAINTENANCE ENHANCEMENT	F6315	NTX259AA03
DATAPATH EXTENSION UNIT DPX	F5585	NTX259AA03
DATAPATH KEYBOARD DIALING	F3177	NTX250AA12
DATAPATH MCD DATA TRANSMISSION DELAY	F6076	NTX250AA12
DATAPATH MTA	F6176	NTX250AA12
DATAPATH PROFILE ENHANCEMENTS II	F7270	NTX250AA12
DATAPATH SPEED RESTRICTED CALLING	F3899	NTX250AA12
DCH ENHANCEMENTS FOR ISDN FUNCTIONAL SIGNALLING	F6647	NTX750AB04
DCM-R DIAGNOSTIC	F0706	NTX023AB03
DDD ACCESS (+1)	F0099	NTX001AA21
DDD THROUGH TOPS ANI 1,2 PARTY	F0799	NTX902AA07
DDD THROUGH TOPS ANI 4 PARTY	F2169	NTX902AA07
DDD THROUGH TOPS COIN	F0178	NTX902AA07
DDD THROUGH TOPS HOTEL/MOTEL	F0800	NTX902AA07
DDD THROUGH TOPS ONI 1,2 PARTY	F0285	NTX902AA07
DDS HAIRPIN	F6405	NTX299AA02
DDS HAIRPIN	F6405	NTX299AB01
DDU IMAGE VOLUME SIZE INCREASE	F2792	NTX074AA06
DECOUPLE CC RELOAD RESTART FROM XPM RESTART	F6442	NTX270AA12
DEFAULT DATA	F3408	NTX001AA21
DEFERRED OM OUTPUT	F6219	NTX001AA21
DELAY CALL DENIAL	F2405	NTX030CC10
DELAYED OPERATION	F1174	NTX100AA20
DELETE/PREFIX UP TO 15/11 DIGITS RESPECTIVELY	F0154	NTX001AA21
DENIED ORIGINATING	F0199	NTX901AA17
DENIED ORIGINATING - 2/4 PARTY ANI	F2436	NTX901AA17
DENIED SERVICE	F0200	NTX901AA17
DENIED TERMINATING	F0201	NTX901AA17

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DETECTION ENHANCEMENTS OF MACHINE CONGESTION CONDITION	F6250	NTX060AB10
DETECTION OF ANSWER SUPERVISION	F0055	NTX001AA21
DETECTION OF DISCONNECT	F0056	NTX001AA21
DETECTION OF HIT	F0059	NTX001AA21
DETECTION OF OPEN LINE AT MDF	F2460	NTX901AA17
DEVICE INDEPENDENT SUPPORT FOR APPLICATION DATA TRANSFER	F6237	NTX001AA21
DE4 DPX HAIRPIN TO DTC	F6256	NTX621AA02
DIAL - CALL WAITING	F3484	NTX435AA02
DIAL BACK ON OTHER MODEMS	F3896	NTX293AA02
DIAL CALL WAITING FOR EBS	F7201	NTX106AA09
DIAL PULSE CONVERSION DP TO DTMF	F0778	NTX100AA20
DIAL PULSE CONVERSION DTMF TO DP	F0779	NTX100AA20
DIAL RATE	F0953	NTX030CC10
DIAL TONE SPEED MEASUREMENT	F0168	NTX901AA17
DIAL TONE SPEED RECORDING FOR LCM	F3118	NTX270AA12
DIAL TONE UPON TRUNK SEIZURE	F1624	NTX100AA20
DIALABLE CABLE LOCATOR TONE	F2569	NTX277AA02
DIALABLE SHORT CIRCUIT	F2570	NTX277AA02
DIALED LOOPBACK ON TRUNK	F6528	NTX001AA21
DICTIONATION ACCESS AND CONTROL (DTMF ONLY)	F0394	NTX100AA20
DID PBX VIA HAIRPIN	F6404	NTX299AA02
DID PBX VIA HAIRPIN	F6404	NTX299AB01
DID/DOD OVER 2-WAY PBX LOOP TRUNK	F0363	NTX008AB02
DIFFERENTIATE ENH ACD SHOW FROM BASIC ACD SHOW - ENH I	F6167	NTX416AB02
DIFFERENTIATE ENH ACD SHOW FROM BASIC ACD SHOW - ENH I	F6167	NTX416AC01
DIGITAL DS-1 BIT RATE	F0052	NTX001AA21
DIGITAL ECHO SUPPRESSORS SERVICE CIRCUIT	F0686	NTX063AA02
DIGITAL PAD ADJUSTMENT	F1194	NTX055AC02
DIGITAL RECORDED ANNOUNCEMENT	F2303	NTX001AA21
DIGITONE STATION TESTING	F0213	NTX901AA17
DIRECT DIAL OVERSEAS (DDO)	F0536	NTX030CC10
DIRECT INWARD DIALLING (DID)	F0395	NTX100AA20
DIRECT INWARD DIALLING (DID) OVER 1-WAY TRUNK TO PBX	F0364	NTX008AB02
DIRECT INWARD SYSTEM ACCESS (DISA)	F0758	NTX103AA09
DIRECT OUTWARD DIAL (DOD) ANALOG FACILITY	F1191	NTX007AB02
DIRECT OUTWARD DIALLING (DOD)	F0396	NTX100AA20
DIRECTED CALL PARK	F3925	NTX414AA01
DIRECTED CALL PARK	F3925	NTX571AA01
DIRECTED CALL PICK-UP - BARGE IN	F3487	NTX435AA02
DIRECTED CALL PICK-UP - NON BARGE IN	F3488	NTX435AA02
DIRECTIONAL RESERVATION EQUIPMENT (DRE)	F0318	NTX060AB10
DIRECTORY ASSISTANCE CHARGING (411 CALLS TO AMA)	F0295	NTX801AA01
DIRECTORY ASSISTANCE CHARGING(411 RECORDING ON MAG TAPE)	F0231	NTX901AA17
DIRECTORY ASSISTANCE HANDLING	F0557	NTX030CC10
DIRP DISK ERASE FILE SECURITY ENHANCEMENT	F6063	NTX001AA21
DIRP PROCESS REVIVAL	F6092	NTX001AA21
DIRP REALTIME ENHANCEMENTS	F6093	NTX001AA21
DIRP RECORDING SPACE USAGE ENHANCEMENTS	F7175	NTX001AA21

Feature Title	Feat	PEC
DIRP SECURITY ENHANCEMENT	F2818	NTX001AA21
DISA CALL PROMPTING DEFAULT DESTINATION	F2969	NTX103AA09
DISA REMOVE AUTHCODE TIMEOUT	F3932	NTX103AA09
DISA ROBUSTNESS	F7063	NTX103AA09
DISA THIRD DIAL TONE	G0081	NTXA31AA01
DISK SOFTWARE REWRITE - PHASE 2	F7216	NTX074AA06
DISK STORAGE OF PERIPHERAL LOADS	F1226	NTX074AA06
DISPLAY DPP THROUGH IOD LEVEL	F2879	NTX243AA07
DISPLAY QUEUE STATUS KEY	F5600	NTX415AA04
DISPLAY/PRINTER TERMINALS	F0838	NTX001AA21
DISTINCTIVE AND RING AGAIN RINGING-MF	F2531	NTX101AA13
DISTINCTIVE CALL WAITING RINGBACK	G0082	NTXA32AA01
DISTINCTIVE CALL WAITING TONES	F3783	NTX435AA02
DISTINCTIVE RINGING	F1180	NTX101AA13
DLSE CALL CLASSIFICATION AND SELTION	F6054	NTX215AA02
DMO - FOR NEW PERIPHERAL MODULES	F3103	NTX270AA12
DMO COMMAND FOR DID SERVICE	F2341	NTX008AB02
DMO PRETESTING - TRUNK AND TRANSLATION	F0650	NTX056AA04
DMS DATA COLLECTION	F7142	NTX563AA03
DMS PASSTHROUGH MAP APPLICATION ENTITY	F5955	NTX812AA03
DMS SCHEDULER CLASS FOR NOS FILE TRANSFER	F6417	NTX001AA21
DMS USER INTERFACE TO ACD MIS	F6445	NTX991AA01
DMS USER INTERFACE TO ACD MIS	F6445	NTX991AB02
DMS-BUS SOFTWARE SUPPORT FOR THE NEW 9X23 BACKCARD	F7405	NTX940AA06
DMS-1 LINE TEST VIA LTA	F2695	NTX213AB02
DN ATTRIBUTES SERVICE ORDER ENHANCEMENT	F7084	NTXA40AA02
DN NETWORK ATTRIBUTES	F6529	NTXA40AA02
DNH WITH CWT AND PREFERENTIAL HUNT OPTIONS	F2752	NTX007AB02
DNPIC BULK DMO TOOL	F6263	NTX710AA02
DO NOT DISTURB	F1153	NTX110AA01
DOCUMENTATION OF MINOR ENHANCEMENTS	F5785	NTX415AA04
DOMESTIC BILLING RESTRICTIONS	F2335	NTX030CC10
DPP ROBUSTNESS ENHANCEMENTS	F6246	NTX243AA07
DPX MAINTENANCE	F5754	NTX259AA03
DRA - RECORDING ON EE PROM	F3461	NTX001AA21
DSP NOTIFICATION OF LOAD MANAGEMENT	F6515	NTX991AB02
DTC CUTOVER FEATURE	F2573	NTX057DA01
DTC CUTOVER FEATURE	F2573	NTX057EA01
DTMF OUTPULSING ON A LINE	F1887	NTX101AA13
DTMF OUTPULSING ON DTCS WITHOUT SENDERS	F3842	NTX001AA21
DTSR CAPACITY ENHANCEMENTS	F6162	NTX270AA12
DTSR ON A PER PM BASIS	F2931	NTX901AA17
DTSR REALTIME ENHANCEMENTS	F6190	NTX270AA12
DTU BERT	F6352	NTX881AB02
DTU BERT	F6352	NTX881AC02
DTU BERT	F6352	NTX882AA03
DTU F/W DOWNLOADER	F6354	NTX001AA21
DU AUTOBAND	F3990	NTX250AA12
DU MONITOR/CO LOOPBACK	F3342	NTX250AA12

Feature Title	Feat	PEC
DUAL RCC - ESA MAINTENANCE	F6634	NTX380AA02
DUAL RCC - ESA POTS INTERCALLING	F6580	NTX380AA02
DUAL RCC - ESA SYNCHRONIZATION	F6574	NTX380AA02
DUAL RCC - INTERLINK MESSAGING	F6468	NTX380AA02
DUAL RCC - INTERLINK TABLE CONTROL AND STATIC DATA	F6569	NTX380AA02
DUAL RCC - INTERSWITCH OPERATIONAL MEASUREMENTS	F6473	NTX380AA02
DUAL RCC - PERIPHERAL LINE INTERSWITCH ENHANCEMENTS	F6472	NTX380AA02
DUAL RCC - PP ESA MAINTENANCE	F6576	NTX380AA02
DUAL RCC - PP ESA MAINTENANCE ENTRY/EXIT	F6577	NTX380AA02
DUAL RCC - PP LINE INTERSWITCH	F6469	NTX380AA02
DUAL RCC - WARM SWACT(PP)	F6579	NTX380AA02
DUAL RCC ESA FORCE DOWN OPTION	F7206	NTX380AA02
DUAL RCC-ESA MDC TRANSLATIONS	F6633	NTX380AA02
DUAL RCC-ESA OMS(CC)	F6582	NTX380AA02
DUAL RCC-ESA OMS(PP)	F6583	NTX380AA02
DUAL RCC-ESA TRUNKING	F6581	NTX380AA02
DUMP AND RESTORE ROBUSTNESS	F6499	NTX184AA09
DUMP OF OFFICE DATA FOR VERIFICATION	F1721	NTX182AA04
DYNAMIC ALLOCATION OF CENTRALIZED MAP SESSIONS	F6412	NTX812AA03
DYNAMIC ATTENDANT CONSOLE MEASUREMENTS	F1636	NTX410AA02
DYNAMIC OVERLOAD CONTROL (DOC)	F0319	NTX060BA02
DYNAMIC OVERLOAD CONTROL (DOC)	F0319	NTX060BB01
DYNAMIC PM RECONFIGURATION	F6602	NTX001AA21
E&M TEST	F1085	NTX802AA04
EA - CALL FORWARDING ENHANCEMENT	F5426	NTX020AC01
EA - CC REAL TIME IMPROVEMENT	F5425	NTX186AA06
EA - CC REAL TIME IMPROVEMENT	F5425	NTX386AA03
EA - EXPANDED TOLL DENIAL	F5424	NTX186AA06
EA PRESUBSCRIPTION REPORTS	F2772	NTX711AA02
EA PRESUBSCRIPTION REPORTS	F2772	NTX711AB02
EA PRESUBSCRIPTION REPORTS ON IBN	F2910	NTX711AB02
EA: OPTIONAL/SAC CODES	F5677	NTX186AA06
EADAS - FLEXIBLE OM TRANSFER PERIOD	F5407	NTX218AA03
EADAS - OM I/F	F3916	NTX218AA03
EADAS DATA FORMAT ROBUSTNESS	F5927	NTX218AA03
EADAS DATAFILL SEQUENCE SIMPLIFICATION	F5759	NTX218AA03
EADAS MMI	F3917	NTX218AA03
EADAS/NM - ADMINISTRATION AND OPERATION	F3983	NTX455AA01
EADAS/NM - ADMINISTRATION AND OPERATION	F3983	NTX455AB01
EADAS/NM AUDIT INTERFACE	F6317	NTX455AB01
EADAS/NM COMMAND INTERFACE	F6316	NTX455AB01
EADAS/NM 5-MINUTE PACKET INTERFACE	F6318	NTX455AB01
EAE0 - ABBREVIATED DIAING	F1737	NTX186AA06
EAE0 - IBN PIC USING SERVORD	F2853	NTX734AA01
EAE0 - IC/INC EVENT STATUS ENHANCEMENT	F5572	NTX186AA06
EAE0 - NEW LOGS	F1736	NTX186AA06
EAE0 - NEW TREATMENTS	F1733	NTX186AA06
EAE0 - ORIGINATING AND TERMINATING BILLING	F1734	NTX186AA06
EAE0 - PEG COUNT	F3737	NTX085AA05

Feature Title	Feat	PEC
EAE0 - P2(PX) TRUNK COMPATIBILITY	F5490	NTX186AA06
EAE0 - REPORT	F3739	NTX088AA04
EAE0 - TRANSLATION AND CARRIER SCREENING	F1731	NTX186AA06
EAE0 - TRUNK TO AT & IC	F1732	NTX186AA06
EAE0 - USAGE	F3738	NTX087AA04
EAE0 - 00 MINUS DIALING ROUTED VIA PIC	F5489	NTX186AA06
EAE0 EXCHANGE ACCESS OPERATOR SERVICES SIGNALLING	F2960	NTX888AA01
EAE0 TSMS CARRIER OVFL PC	F1735	NTX085AA05
EBCDIC RECORDING	F2287	NTX081AA01
EBS AS A MESSAGE CENTER	F2888	NTX822AA01
ECCB IMPROVEMENTS	F6233	NTX001AA21
ECHO RETURN LOSS (ERL) TEST	F2201	NTX055AC02
ECHO SUPPRESSOR CIRCUITS - EXTENDED TO 5000	F2403	NTX063AA02
ELIMINATION OF SPB, FNT AND FLAT RATE OPTIONS	F2522	NTX245AA01
EMERGENCY OPERATION	F0477	NTX025AA02
ENABLE GAINS ON CLSI NETWORK	F5655	NTX001AA21
END OF TAPE ALARM	F0570	NTX042AA04
END OF TAPE ALARM	F0570	NTX044AA04
END TO END SIGNALLING	F1164	NTX100AA20
END TO END SIGNALLING	F6809	NTX106AA09
ENHANCED ACTIVITY	F6091	NTX291AA04
ENHANCED AMADUMP CAPABILITY	F6994	NTX001AA21
ENHANCED CALL PROCESSING FOR FUNCTIONAL SIGNALLING	F6386	NTX753AA02
ENHANCED CC MAINTENANCE SUPPORT FOR RLCM	F5920	NTX154AA03
ENHANCED CODE CONTROLS	F6248	NTX060AB10
ENHANCED COMMAND SCREENING	F3334	NTX292AB03
ENHANCED COMMAND SCREENING	F3334	NTX292BA02
ENHANCED CORE SYSTEM LOAD UNIT	F6456	NTX942AA04
ENHANCED DIRP FILE	F5766	NTX001AA21
ENHANCED DISK MNTCE	F1463	NTX074AA06
ENHANCED DS-1 INTERFACE MAINTENANCE	F6299	NTX270AA12
ENHANCED ESSENTIAL SERVICE PROTECTION	G0112	NTX902AA07
ENHANCED FIBER MONITORING	F2975	NTX987AA01
ENHANCED LCM OVERLOAD CONTROLS	F5936	NTX001AA21
ENHANCED MAINTENANCE FOR TPC RACKMOUNT	F6508	NTXA90AA01
ENHANCED MAINTENANCE FOR TPC RACKMOUNT	F6508	NTX731AA03
ENHANCED MAINTENANCE FOR UTRS	F5506	NTX269AA07
ENHANCED MAON CALL CONTROL	F6682	NTX878AB02
ENHANCED PRIORITY TERMINAL	F3826	NTX001AA21
ENHANCED REAL TIME INDICATOR	F1489	NTX001AA21
ENHANCED REAL TIME INDICATOR	F1489	NTX291AA04
ENHANCED REASON DISPLAY	F7152	NTX108AA05
ENHANCED SERVICE ORDER	F2885	NTX733AA02
ENHANCED SERVICE ORDER	F2885	NTX733AB02
ENHANCED SERVICE ORDER	F2885	NTX733AC01
ENHANCED SERVORD FOR BUSINESS SET	F5718	NTX106AA09
ENHANCED SERVORD II	F2925	NTX733AB02
ENHANCED SERVORD II	F2925	NTX733AC01
ENHANCED TCALLCT FOR POSSIBLE FIELD USE	F6504	NTX184AA09

Feature Title	Feat	PEC
ENHANCED TRAFFIC SIMULATOR	F1726	NTX182AA04
ENHANCED TRUNK INVENTORY AND SPARES TESTING	F2327	NTX176AA05
ENHANCED XPM CALL PROCESSING FOR FUNCTIONAL SIGNALLING	F6379	NTX753AA02
ENHANCED XPM/LCM ROBUSTNESS	F3952	NTX001AA21
ENHANCED 9X12 DIAGNOSTICS	F6485	NTX940AA06
EQUAL ACCESS ENHANCED CARRIER TOLL DENIAL	G0051	NTXA24AA01
EQUAL ACCESS MULTIPARTY LINE IDENTIFICATION	G0052	NTX711AB02
EQUAL ACCESS ON IBN/DATAPATH	F3908	NTX186AA06
ERL AND SRL CAPABILITY TO ATMS'	F3828	NTX136AA03
ESA - PREFIX TRANSLATION TABLE CONTROL	F5768	NTX149AA02
ESA - PREFIX TRANSLATION TABLE CONTROL	F5768	NTX149AB02
ESA - TAKEOVER/TAKEBACK	F1449	NTX154AA03
ESA - TRANSLATION	F1450	NTX154AA03
ESA CALL CONTROL	F6470	NTX380AA02
ESA CALL CONTROL II	F6578	NTX380AA02
ESA EXIT SUPPORT FOR RLCM	F5919	NTX154AA03
ESF USING NTX6X50AB	F6507	NTX143AA01
ESN - ANSWER SUPERVISION GENERATION	F1763	NTX102AA04
ESN - NETWORK CLASS OF SERVICE	F1185	NTX430AA02
ESN - NETWORK INFORMATION SIGNALS	F1753	NTX430AA02
ESN - NETWORK WIDE AUTOMATIC ROUTE SELECTION	F0757	NTX430AA02
ESN - VARIABLE TYPES OF OUTPUTSING ON SAME CALL	F1760	NTX101AA13
ESSENTIAL SERVICE PROTECTION (ESP)	F2538	NTX902AA07
EXCHANGE ALTERNATE BILLING SERVICE	F2906	NTX825AA02
EXEC STORE EXPANSION	F5751	NTX901AA17
EXECUTIVE BUSY OVERRIDE	F1270	NTX101AA13
EXECUTIVE CONFERENCE	G0078	NTXA27AA01
EXPANDED FXDNMAP	G0007	NTX030CC10
EXPANDED INBAND SIGNALLING	F2433	NTX901AA17
EXPANDED MERIDIAN DIGITAL CENTREX CAPACITY	F6638	NTX100AA20
EXPANDED OPERATOR DISPLAY	F2338	NTX030CC10
EXPANDED SPEED CALL CAPABILITIES	F5431	NTX020AC01
EXPENSIVE ROUTE WARNING TONE	F1629	NTX105AA03
EXTENDED AREA SERVICE	F0036	NTX901AA17
EXTENDED OPERATOR FEEDBACK DATA (BREAKDOWN BY CALL TYPE)	F0545	NTX030BA03
EXTENSION BRIDGED SERVICES	F2714	NTXA81AA01
E800	F5674	NTX554AA01
FACILITY REJECT MESSAGE ON PRA	F7326	NTX791AA02
FEATURE ENHANCED HIGH SPEED DU(AP) FIRMWARE VERSION 4	F6080	NTX250AA12
FEATURE GROUP C AND D COMPATIBILITY	F3860	NTX186AA06
FEATURE PACKAGE IN SOS	F3888	NTX000AA13
FGA TERMINATING RECORD	F2768	NTX083AA01
FGB - AMA ENHANCEMENTS	F5491	NTX209AA03
FGB - AMA ENHANCEMENTS	F5491	NTX211AA02
FGB-AMA ENHANCEMENTS II	F5742	NTX209AA03
FGB-AMA ENHANCEMENTS II	F5742	NTX268AA02
FGD-EA ALTERNATE SWITCHING POINT ROUTING	F2901	NTX803AA02
FILE SYSTEM DEVICES INCREASED	F5436	NTX001AA21

Feature Title	Feat	PEC
FILE TRANSFER FROM DMS TO NOS	F3905	NTX562AA02
FILE TRANSFER FROM DNC TO DMS VIA NOP 1X.25	F7128	NTX562AA02
FIXED CALL FORWARDING	F2255	NTX020AC01
FIXED TRUNK GROUP NUMBERING FOR THE OM SYSTEM	F7058	NTX001AA21
FIXED TRUNK GROUP NUMBERING NOT OPTIONAL	F5676	NTX001AA21
FIXED TRUNK GROUP NUMBERING-SMDR	F6564	NTX001AA21
FLASH IGNORE (PBX - 2 SEC DISC TIMING)	F0346	NTX007AB02
FLASH RECALL DURING INITIAL PERIOD	F0975	NTX030CC10
FLEXIBLE ALARM SENDING	F2521	NTX053AA05
FLEXIBLE AMA EXPANSION	F6519	NTX737AB01
FLEXIBLE ANI ID = 8,9 ASSIGNMENT	F2501	NTX901AA17
FLEXIBLE ANI ID = 8,9 HANDLING	F2456	NTX030CC10
FLEXIBLE ANI INFORMATION DIGIT ASSIGNMENT	F2713	NTX735AA01
FLEXIBLE BC AMA CALL CODES	F2896	NTX737AA01
FLEXIBLE BC AMA CALL CODES	F2896	NTX737AB01
FLEXIBLE CONSOLE ALERTING	F1797	NTX101AA13
FLEXIBLE DISPLAY LANGUAGE	F2455	NTX175AA01
FLEXIBLE INTERCEPT	F0397	NTX100AA20
FLEXIBLE LEN NUMBERING	F1353	NTX901AA17
FLEXIBLE LONG DURATION CALL REPORTING	F2591	NTX042AA04
FLEXIBLE LONG DURATION CALL REPORTING	F2591	NTX044AA04
FLEXIBLE REROUTE(FRR)-MMT,OM AND DB	F6059	NTX060BB01
FOCUSED LINE MAINTENANCE	F3830	NTX272AA02
FOCUSED MAINTENANCE	F3829	NTX272AA02
FOREIGN AREA TRANSLATION	F0155	NTX001AA21
FOREIGN EXCHANGE (FX) TRUNK - ANALOG	F1165	NTX100AA20
FOREIGN EXCHANGE LINES ANALOG	F0171	NTX901AA17
FRACTIONAL TAX	F2737	NTX030CC10
FRAUDULENT CALL PREVENTION	F0625	NTX901AA17
FREE EMERGENCY CALLING FROM: COIN LINES	F0747	NTX019AA01
FREE EMERGENCY CALLING FROM: MEASURED LINES	F0748	NTX019AA01
FREE EMERGENCY CALLING FROM: PUBLIC MOBILE RADIOS	F0749	NTX019AA01
FREE NUMBER TERMINATING	F0203	NTX901AA17
FREEZEONREINIT PARAMETER	F2715	NTX001AA21
FREQUENCY RINGING - HARMONIC	F0258	NTX901AA17
FREQUENCY RINGING - SYNCHROMONIC - 20HZ BARE	F0259	NTX901AA17
FREQUENCY SELECTIVE DECIMONIC	F0019	NTX901AA17
FREQUENCY SELECTIVE SYNCHROMONIC-16HZ BASE	F0826	NTX901AA17
FTS PHASE I	F7110	NTX833AA03
FTS ROBUSTNESS AND FAULTS	F6642	NTX833AA03
FUNCTIONAL SIGNALLING - CONNECTION MANAGEMENT	F6399	NTX790AA03
FUNCTIONAL SIGNALLING - INTERACTIONS	F6544	NTX790AA03
FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT	F6398	NTX790AA03
FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT	F6548	NTX790AA03
NEHANCEMENTS		
FUNCTIONAL SIGNALLING ACCESS TO MDC FEATURES	F6388	NTX753AA02
FX LINE TERMINATION ON DCM	F2054	NTX094AA01
FX TRUNK DIGITAL 2 WAY	F2369	NTX100AA20
GENERAL DISTINCTIVE RINGING	F5837	NTX101AA13

Feature Title	Feat	PEC
GENERALIZED MAP CAPABILITY	F5710	NTX000AA13
GENERALIZED MAP CAPABILITY	F5710	NTX560AA03
GENERALIZED MAP CAPABILITY	F5710	NTX560AB02
GENERIC RO SERVICE ENHANCEMENTS	F6236	NTX560AA03
GENERIC RO SERVICE ENHANCEMENTS	F6236	NTX560AB02
GLARE RESOLUTION	F0057	NTX001AA21
GOC-990 NXX CODE	F1480	NTX100AA20
GROUNDED RINGING	F0035	NTX901AA17
GROUP NUMBER FEATURE CONTROL	G0040	NTX733AC01
GUARANTEED DIAL TONE	F3890	NTX901AA17
HARD TO REACH CODE LIST (HTR)	F0672	NTX060BA02
HARD TO REACH CODE LIST (HTR)	F0672	NTX060BB01
HAYES KEY BOARD DIALING HIGH SPEED ENHANCEMENTS	F7271	NTX250AA12
HIGH SPEED DU WITH ELASTOMER KEY PAD	F5554	NTX250AA12
HIGH WATER MARK OMS FOR CP,EXT,FTRQ	F6402	NTX001AA21
HOME/FOREIGN AREA TRANSLATION AND SCREENING	F0302	NTX801AA01
HOST TOPS MP O.C.-DATA LINK HANDLING	F2940	NTX873AA01
HOTEL ADMINISTRATION SYSTEM (HADS)	F0552	NTX030CC10
HOTEL 1+, 0+, 0-	F0933	NTX030CC10
HOTEL/MOTEL	F0113	NTX901AA17
HOTEL/MOTEL	F0349	NTX007AB02
REGISTRATION		
HSDA DIAGNOSTICS	F7382	NTXA90AA01
HUNT GROUP ENHANCEMENT	F5901	NTX007AB02
HUNT GROUP SIZE EXPANSION	F2750	NTX007AB02
HUNTING	F1237	NTX100AA20
HUNTING	F0350	NTX007AB02
HUNTING	F1105	NTX007AB02
SEQUENTIAL		
HUNTING	F0187	NTX901AA17
HUNTING	F0351	NTX007AB02
HUNTING	F0352	NTX007AB02
HUNTING OPTIONS	F0347	NTX007AB02
HUNTING OPTIONS	F0356	NTX007AB02
HUNTING OPTIONS	F0358	NTX007AB02
HX IMMUNITY REGIONS FOR C1 PROCESSES	F7363	NTX001AA21
I/C TRUNK LOAD CONTROL	F0320	NTX060AB10
I/O SYSTEM STRAY NODE REMOVAL TOOL	F1671	NTX184AA09
IAC WARM SWACT FOR ISDN CALL PROCESING	F6381	NTX750AB04
IBERT RESOURCE MANAGEMENT	F6599	NTX881AB02
IBERT RESOURCE MANAGEMENT	F6599	NTX881AC02
IBERT RESOURCE MANAGEMENT	F6599	NTX882AA03
IBM3274 DATA UNIT	F3973	NTX250AA12
IBM3278 DATA UNIT	F3974	NTX250AA12
IBN - CALL FORWARD DO-NOT ANSWER(CFDA) FROM IBN HUNT GROUP	F2820	NTX100AA20
IBN - CALL FORWARD GROUP DO-NOT ANSWER(CFGDA) FOR IBN HUNT G	F6646	NTX100AA20
IBN AND ESB COMPATIBILITY	F3448	NTX399AA01

Feature Title	Feat	PEC
IBN ATTENDANT CONSOLE OM ON AN INDIVIDUAL CONSOLE BASIS	F2946	NTX856AA02
IBN AUTH CODES FOR ALTERNATE ROUTE SELECTION(ARS)	F2822	NTX103AA09
IBN CALL FORWARDING VALIDATION	F2549	NTX100AA20
IBN CALL PICK-UP ENHANCEMENTS	F3956	NTX100AA20
IBN CANCEL CALL WAITING	F6163	NTX824AA01
IBN CANCEL CALL WAITING	F6163	NTX824AB01
IBN COMPATIBILITY WITH ATT LAMA FORMAT AND MUMR	F2512	NTX159AA06
IBN FEATURE ACTIVATION OMS I	F5635	NTX100AA20
IBN FLASH TRANSLATOR	F5445	NTX100AA20
IBN OFF-HOOK QUEUING OMS	F2735	NTX105AA03
IBN QUANTITY CONTROL(100 LINES)	F2526	NTX100AA20
IBN SECURITY CODE - 2500 ONLY	F5547	NTX573AA01
IBN SECURITY CODE -2500 AND BUSINESS SETS	F5548	NTX574AA01
IBN TRUNKS WITH ISUP SIGNALLING	F6676	NTXA79AA02
IBN-OPTIONAL CALL FORWARD LINKS	G0017	NTX857AA01
IBN/ESN CALLS IN BELLCORE AMA FORMAT	F2615	NTX165AA06
IDENTIFICATION OF ALARMS OUTPULSE ANI DIGIT 8	F0623	NTX053AA05
IDENTIFICATION OF INTERCEPT OUTPULSE ANI DIGIT 9	F2066	NTX001AA21
IDENTIFICATION OF ISDN ISLC-1B IN DMS ARCHITECTURE	F6128	NTX750AB04
IDENTIFICATION OF TRUNK CLASS SENT-PAID RESTRICTED CALLS	F0948	NTX030CC10
IDENTIFICATION OF: ALARMS,ANI ID 8	F0945	NTX030CC10
IDENTIFICATION OF: DIRECT HOTEL TRUNKS	F1107	NTX030CC10
IDENTIFICATION OF: INTERCEPT,ANI ID 9	F0946	NTX030CC10
IDENTIFICATION OF: ORIGINATING CLASS - ANI MATCH	F2289	NTX030CC10
IDENTIFICATION OF: TRK CLASS HOTEL/MOTEL CALLS	F0947	NTX030CC10
IMAGE TEST ENHANCEMENTS	F6413	NTX001AA21
IMMEDIATE ANSWER REPORTING	F5765	NTX901AA17
IMMEDIATE NOTIFICATION OF PRIORITY ENQUEUED CALLS	F2528	NTX262AA01
IMPROVE SWITCH ROBUSTNESS AGAINST RAM ERRORS	F5924	NTX001AA21
IMPROVED AMA TIMING COMPENSATION	F5577	NTX001AA21
IMR/INW READ RESET BY NNX	F2491	NTX901AA17
INBOUND MODEM POOLING	F3174	NTX251AA05
INCOMING CALL PRIORITY	F5963	NTX407AB01
INCOMING CALL QUEUE	F5964	NTX407AB01
INCOMING CALL QUEUE	F5968	NTX407AB01
INCOMING PHASE DETECTION ON STANDARD DS-1 RATE INTERFACE	F0592	NTX048AA04
INCOMING START-TO-DIAL DELAY(ISDD)MEASUREMENT	F2883	NTX270AA12
INCOMING TEST TRUNK (2X90AD) ENHANCEMENTS(CC)	F5563	NTX195AA05
INCOMING TEST TRUNK FROM AECO LOCAL TEST DESK	F0068	NTX001AA21
INCOMING TRUNK CALL PROCESSING	F5990	NTX710AA02
INCOMING/OUTGOING TRUNK IRREGULARITIES PEG COUNT	F0628	NTX053AA05
INCREASE AUTHCODES PER CUSTOMER GROUP	F3797	NTX103AA09
INCREASE IN NUMBER OF CUSTOMER GROUPS	F1476	NTX100AA20
INCREASE MAXIMUM NUMBER FOR ISDN TERMINAL PROFILES	F6385	NTX750AB04
INCREASE NUMBER OF EQUIVALENT DN APPEARANCE FOR IBN	F3940	NTX100AA20
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INCREASE THE NUMBER OF IO NODE TYPES	F6084	NTX001AA21
INDEPENDANT COIN RECALL INTERVAL	F2422	NTX030CC10
INDIVIDUAL FLAT RATE	F0243	NTX901AA17
INDIVIDUAL LINE BILLING ON INWATS CALLS	F2500	NTX080AA02
INDIVIDUAL LINE BUSINESS SERVICE - PBX APPLICATION	F0406	NTX100AA20
INDIVIDUAL MESSAGE RATE	F0244	NTX901AA17
INDIVIDUAL PAGE FROM GIC	F2957	NTX878AB02
INFORMATION	F0807	NTX001AA21
INFORMATION AND REPAIR ROUTED TO KEY SYSTEM	F0181	NTX901AA17
INITIAL COIN RETURN/RETAIN OPTION	F2463	NTX901AA17
INPUT COMMAND SCREENING AUTOMATIC LOG ON	F1053	NTX001AA21
INPUT COMMAND SCREENING I/O PORT RESTRICTIONS	F0010	NTX001AA21
INPUT COMMAND SCREENING USER RESTRICTIONS	F1062	NTX001AA21
INSTRUCTIONAL DISPLAY	F1012	NTX030CC10
INTEGRATED BIT ERROR RATE TESTING (IBERT)	F5693	NTX250AA12
INTEGRATED CO COMMUNICATIONS	F0121	NTX001AA21
INTEGRATED LOCAL SPECIALS	F6257	NTX621AA02
INTEGRATED LOCAL SPECIALS/SPOTS	F6585	NTX299AB01
INTEGRATED SERVICES ACCESS/CALLING NUMBER DELIVERY	F6397	NTX790AA03
INTEGRATED TERMINATING 105 TEST LINE & RESPONDER	F3827	NTX903AA01
INTEGRITY CHECK TRAFFIC SIMULATOR(ICTS)	F6356	NTX885AA02
INTEGRITY CHECK TRAFFIC SIMULATOR(ICTS)	F6356	NTX885AB01
INTEGRITY CHECKING,CONTINUITY & FACILITY CHECKS ON TRUNKS	F0042	NTX001AA21
INTERACTIVE CRT FOR MTCE I/O CYBERNEX MDL-110	F0825	NTX001AA21
INTERACTIVE CRT FOR MTCE I/O HAZELTINE MODULAR ONE	F0823	NTX001AA21
INTERACTIVE CRT FOR MTCE I/O VT100	F0824	NTX001AA21
INTERCEPTED CALL ROUTED TO ANNOUNCEMENT	F0094	NTX001AA21
INTERCEPTED CALL ROUTED TO OPERATOR	F0095	NTX001AA21
INTERCEPTED CALL ROUTED TO TONE	F0096	NTX001AA21
INTERCHANGEABLE AREA/OFFICE CODES-E DIGIT UNBLOCKING	F0156	NTX001AA21
INTERFACE TO CAMA SWITCHBOARDS	F0109	NTX001AA21
INTERFACE TO CO-LOCATED NE/AE	F1063	NTX001AA21
SWITCHBRD I/C		
INTERFACE TO CO-LOCATED NE/AE	F1064	NTX001AA21
SWITCHBRD O/G		
INTERFACE TO DMS-10 ,DMS-100 ,DMS-200	F0810	NTX001AA21
INTERFACE TO MODIFIED N.E. TSD FOR ONI	F0033	NTX001AA21
INTERFACE TO S-C SCAMA OPER POSN-ONI/ ANIF	F0015	NTX001AA21
INTERFACE TO S-C TURRET - VISUAL	F0013	NTX001AA21
INDICATORS		
INTERFACE TO SC XY FOR ANI/CAMA	F2113	NTX001AA21
INTERFACE TO STROMBERG-CARLSON TURRET -ONI	F0034	NTX001AA21
INTERFACE TO T1,DE2/DE3/D1D	F0811	NTX001AA21
INTERFACE TO UDC DATA POLLER FOR OM	F0822	NTX001AA21
INTERFACE TO 3CL SWITCHBOARD	F0108	NTX001AA21
INTERFACE TO AND OPERATION OF DATA UNIT	F1334	NTX250AA12

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INTERFACE TO CENTRALIZED ATT SYSTEMS VIA APC ROTL V	F0619	NTX052AB02
INTERFACE WITH #14 LTD - DIRECT	F0206	NTX901AA17
INTERFACE WITH #14 LTD - VIA SARTS	F0173	NTX901AA17
INTERFACE WITH #3 LTC	F0054	NTX901AA17
INTERFACE WITH AE #1 LTD	F0174	NTX901AA17
INTERFACE WITH AE #21 LTD	F0164	NTX901AA17
INTERFACE WITH AE# 30	F0804	NTX901AA17
INTERFACE WITH CALRS	F0803	NTX901AA17
INTERFACE WITH DACS	F0209	NTX901AA17
INTERFACE WITH LORDEL MITS70 LINE TEST	F0215	NTX901AA17
SYSTEM		
INTERFACE WITH PORTA SYSTEM LINE TEST	F0143	NTX901AA17
UNIT		
INTERFACE WITH PULSAR II IMTS	F0175	NTX901AA17
INTERFACE WITH STROMBERG-CARLSON #14 LTD	F0210	NTX901AA17
INTERFACE WITH TERADYNE LOOP TEST UNIT	F1217	NTX901AA17
INTERFACE WITH TOPS	F0283	NTX902AA07
INTERFACE WITH TSPS	F0284	NTX902AA07
INTERFACE WITH BADGER 612A	F0208	NTX901AA17
INTERGROUP CALLING	F2393	NTX101AA13
INTERLINK MAINTENANCE	F6466	NTX380AA02
INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)	F1127	NTX030CC10
INTERNATIONAL ROUTING TRANSLATION (U.S)	F1031	NTX072AA01
INTERPOSITION CALLS AND TRANSFERS	F0375	NTX100AA20
INTERPOSITION TRANSFER	F0538	NTX030CC10
INTERWORKING - ISUP TO TOPS	F5842	NTX167AB04
INTRASWITCHING OMS	F3820	NTX150AA03
INTRASWITCHING OMS	F3820	NTX156AA02
INWARD VALIDATION	F2360	NTX036AA01
INWATS FLAT RATE	F0339	NTX006AA04
INWATS ON TIMING REGISTERS	F0341	NTX006AA04
INWATS COMPLETION FROM LOCAL SOURCE	F2749	NTX006AA04
INWATS RECORD ON AMA TAPE	F2258	NTX080AA02
INWATS/OUTWATS	F0334	NTX802AA04
IO FLOW CONTROL MODIFICATIONS	F1673	NTX184AA09
ISA/CN DELIVERY ENHANCEMENTS	F6543	NTX790AA03
ISDD PART 2	F7122	NTX270AA12
ISDN BRA FUNCTIONAL SIGNALLING : CALL PROCESSING I	F6382	NTX753AA02
ISDN BRA FUNCTIONAL SIGNALLING FEATURE ACCESS UTILITY	F6383	NTX753AA02
ISDN BRA OPTICAL LINE CARD MTCE	F6629	NTX750AB04
ISDN CALL PROCESS INDICATION	F6145	NTX750AB04
ISDN D CHANNEL HANDLER ROBUSTNESS	F6114	NTX750AB04
ISDN DCH DEVICE INTERFACE	F7299	NTX750AB04
ISDN IAC SWACT FOR TRANSPORT SERVICES	F6113	NTX750AB04
ISDN LCM BASE DEVELOPMENT	F6651	NTX750AB04
ISDN LCM C-CHANNEL INTERFACE ENHANCEMENTS	F6970	NTX750AB04
ISDN LCM CALL PROCESSING	F6632	NTX750AB04
ISDN LCM CALL PROCESSING II	F6969	NTX750AB04
ISDN LCM CC MAINTENANCE III	F6570	NTX750AB04

Feature Title	Feat	PEC
ISDN LCM LINE MAINTENANCE SUPPORT	F6649	NTX750AB04
ISDN LCM SOFTWARE	F6650	NTX750AB04
ISDN LINE MAINTENANCE	F6129	NTX750AB04
ISDN LTC - ISP AND DCH PERFORMANCE MONITORING	F7353	NTX750AB04
ISDN LTC DCH SWACT SUPPORT	F7300	NTX750AB04
ISDN LTC ISP LOADER	F7293	NTX750AB04
ISDN LTC LOOP EXPANSION	F7307	NTX750AB04
ISDN LTC PM MAINTENANCE I	F7296	NTX750AB04
ISDN LTC/ISP COMMUNICATIONS	F7298	NTX750AB04
ISDN MULTIPLE TERMINALS CALL PROCESSING	F6147	NTX750AB04
ISDN PRA MAINTENANCE - B, D CHANNEL	F6395	NTX790AA03
ISDN PRA MAINTENANCE - INTERACTION	F6545	NTX790AA03
ISDN PRA MAINTENANCE - INTERACTIONS II	F7364	NTX790AA03
ISDN PRA MAINTENANCE - TEST LINES	F6552	NTX790AA03
ISDN ST MAINTENANCE	F6370	NTX750AB04
ISDN TERMINAL TEST AND CONFIGURATION	F6148	NTX750AB04
ISDN-UP ACCESS TO CONSOLE VIA LOOPBACK TRUNK	F6458	NTX167AB04
ISDN-UP MDC FEATURE VIA LOOP-AROUND TRUNKS	F6459	NTX167AB04
ISLM ENHANCEMENT	F6360	NTX750AB04
ISP DIAGNOSTICS	F7294	NTX750AB04
ISUP - FPE ENHANCEMENT TO HANDLE ISUP	F6271	NTX167AB04
ISUP CONTINUITY TEST	F6043	NTX167AB04
ISUP GROUP MESSAGE HANDLING	F5840	NTX167AB04
ISUP MDC INTERWORKING	F6415	NTX167AB04
ISUP PBX TRUNK INTERWORKING	F6653	NTX167AB04
ISUP PROTOCOL VERSION CONTROL	F6959	NTX167AB04
ISUP SUPERVISION ENHANCEMENT	F6046	NTX167AB04
ISUP TANDEM CALL	F5843	NTX167AB04
ISUP TEST LINES TL100,TL102	F5844	NTX167AB04
ISUP TESTLINE ENHANCEMENTS	F6272	NTX167AB04
ISUP TOLL SIGNALLING	F5841	NTX167AB04
ISUP TRUNKS TO ATTENDANT CONSOLE INTERWORKING	F7086	NTX167AB04
ISUP TTP ENHANCEMENTS	F5839	NTX167AB04
ISUP 105 TESTLINE	F6414	NTX167AB04
ISUP/POTS LINES INTERWORKING	F6273	NTX167AB04
ITSE CALL CLASSIFICATION AND SELECTION	F6055	NTX215AA02
ITT ANI FORMAT (RECEIPT)	F0610	NTX049AG01
JOURNAL FILE	F0655	NTX056AA04
JOURNAL FILE DUMP FACILITY	F3383	NTX176AA05
JOURNAL FILE DUMP FACILITY	F3383	NTX182AA04
JOURNAL FILE DUMP FACILITY	F3383	NTX183AA04
JOURNAL FILE OPTION WITH DMOPRO	F5756	NTX056AA04
JOURNAL FILE PRINT UTILITY	F1662	NTX176AA05
K AND S DSM INTEGRATION	F3866	NTX001AA21
KILLER TRUNK REPORT SEPARATION	F3977	NTX562AA02
KILLER TRUNK REPORTING	F6309	NTX053AA05
KP & ST ACCEPTANCE ON AN ONI CALL	F2599	NTX001AA21
LAMA SUPERVISION ANSWER TIMING	F0745	NTX042AA04
LAMA SUPERVISION CALLED DISCONNECT TIMING	F0746	NTX042AA04

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LAST NUMBER REDIAL ASSOCIATED TO H SET	F2956	NTX878AB02
LAST NUMBER REDIAL(LNR)	F3786	NTX101AA13
LATA SCREENING ON 0+ CALLS	F2882	NTX821AA01
LATAWIDE CENTREX BILLING	F2857	NTX713AA01
LCDR ON 2/4 PARTY LINES	F2487	NTX207AA01
LCM BASIC CALL PROCESSING AND MAINTENANCE	F1348	NTX901AA17
LCM CND SUPPORT	F7190	NTX901AA17
LCM DRAWER MAINTENANCE	F5907	NTX001AA21
LCM DRAWER MAINTENANCE - PHASE II	F6155	NTX001AA21
LCM O/G MESSAGE FLOW CONTROL	F6628	NTX001AA21
LCM OVERLOAD CONTROL	F5735	NTX001AA21
LCMI PROCESSOR UPGRADE SUPPORT	F7168	NTX750AB04
LEAS-SPECIAL DIRECTORY NUMBER IDENTIFICATION	G0117	NTX710AA02
LEVEL 1 CAPACITY IMPROVEMENT AND MEMORY REDUCTION	F1668	NTX184AA09
LGC/DTC BASIC CALL PROCESSING & MAINTENANCE	F1323	NTX001AA21
LGC/DTC CONTROLLED PORT DELOADING	F1325	NTX001AA21
LGT/DTC ACTIVITY SWITCHING	F1324	NTX001AA21
LIM CLOCK DIAGNOSTICS	F6645	NTX833AA03
LIM CORE MAINTENANCE I	F6663	NTX833AA03
LIM CORE MAINTENANCE II	F6664	NTX833AA03
LIM F BUS MAINTENANCE	F6666	NTX833AA03
LIM LOCAL MAINTENANCE	F6665	NTX833AA03
LIM OM AND LOGS	F6640	NTX833AA03
LIM RATE ADAPTER ENHANCEMENTS	F6641	NTX833AA03
LIMIT TO NUMBER OF SEQUENCE CALLS	F2680	NTX171CA02
LIMIT TO NUMBER OF SEQUENCE CALLS	F2680	NTX825AA02
LINE APPARANCE TEST PROGRAM	F1722	NTX182AA04
LINE CUT OFF RELAY OPERATION ON DISCONNECT	F2197	NTX901AA17
LINE DATA BASE QUERIES	F0176	NTX901AA17
LINE DATA MODIFICATION	F1724	NTX182AA04
LINE DENIAL OF USP VERTICAL PARTS.	F2922	NTX045AA01
LINE DIAGNOSTIC ENHANCEMENTS FOR SMS	F6030	NTX398AA10
LINE INSULATION TESTING	F0216	NTX901AA17
LINE INVENTORY FOR SLC96	F3976	NTX398AA10
LINE LOAD CONTROL	F0280	NTX902AA07
LINE STATUS IN JOURNAL FILE	F3381	NTX901AA17
LINE TEST DESK INTERFACE	F5414	NTX195AA05
LINE TESTING USING LTU	F0700	NTX023AB03
LINE TRANSMISSION TESTS INSERTION LOSS	F0731	NTX054AA05
LINE TRANSMISSION TESTS MILLIWATT	F1117	NTX054AA05
LINE TRANSMISSION TESTS QUIET TERMINATION	F1116	NTX054AA05
LINE/TRUNK STATUS QUERY OR DUMP	F0126	NTX001AA21
LINE/TRUNK TYPE QUERY	F0159	NTX001AA21
LINES DIAL PULSE (10 PPS)	F0239	NTX901AA17
LINES DIGITONE	F0240	NTX901AA17
LINES FLASHING	F0241	NTX901AA17
LINES GROUND START	F0242	NTX901AA17
LINES LOOP START	F0245	NTX901AA17
LINK ENHANCEMENTS FOR MPC MULTILINK MANAGEMENT	F7244	NTX892AA03

Feature Title	Feat	PEC
LIV TO LIV PROTOCOL	F6637	NTX833AA03
LIV7 CORE MAINTENANCE II	F7135	NTX833AA03
LIV7 DIAGNOSTICS	F6635	NTX833AA03
LM - SUPPORTED COIN FUNCTIONS FOR SLC-96	F5753	NTX901AA17
LM - TAKEOVER/TAKEBACK ENHANCEMENT	F5918	NTX901AA17
LM CUTOVER BY DN	F2542	NTX057EA01
LM ENHANCEMENTS TO SUPPORT NET/PM SPEECH LINK DIAGNOSTICS	F3967	NTX901AA17
LM TAKEOVER/TAKE BACK DIAGNOSTIC	F3865	NTX001AA21
LM/RLM WARM TAKEBACK	F3475	NTX901AA17
LM/RLM WARM TAKEOVER	F3476	NTX901AA17
LMD OM GROUP OPTIMIZATION	F6627	NTX001AA21
LOADER ENHANCEMENTS	F3407	NTX270AA12
LOADFW COMMAND FOR DOWNLOADING MTCE TEST UNIT(MTU)	F5402	NTX055AA03
LOADING/UNLOADING OF OFFICE IMAGE NON-RES	F1130	NTX074AA06
LOCAL AUDIBLE ALARM RETIREMENT	F2692	NTX001AA21
LOCAL BUSY OUT	F6327	NTX250AA12
LOCAL CALL DETAIL RECORDING	F0573	NTX043AA03
LOCAL CALL INTERCEPT	F0291	NTX801AA01
LOCAL COIN OVERTIME CHARGING	F1228	NTX090AA01
LOCAL DIALING	F0101	NTX001AA21
LOCAL END OFFICE ROUTING & SCREENING	F0265	NTX901AA17
LOCAL TANDEM	F0288	NTX902AA07
LOCAL TANDEM (TOLL)	F2151	NTX802AA04
LOCKOUT	F0376	NTX100AA20
LOG ANALYSIS PROGRAM	F1459	NTX178AA01
LOG SYSTEM INTERNAL CONTROL CLEANUP	F6085	NTX001AA21
LOG/REPORT EDITING UTILITY	F1672	NTX184AA09
LOOP AROUND TRUNK FOR ISUP TO POTS LINE	F6044	NTX167AB04
LOOP INTEGRITY CHECKS ON LINES	F0217	NTX901AA17
LOOP MAINTENANCE FOR ISDN LINE CARD NTB25AB	F6648	NTX750AB04
LOOP MONITOR ELIMINATION ON 2X83	F3811	NTX001AA21
LOOPBACK REDUCTION FOR ISUP/AC	F6652	NTX167AB04
LOUD SPEAKER & RADIO PAGING ACCESS	F0409	NTX100AA20
LOW SPEED DU WITH ELASTOMER KEY PAD	F5553	NTX250AA12
LOW VOLTAGE ALARM	F2554	NTX001AA21
LOW VOLTAGE ALARM LOG MESSAGE	F2699	NTX001AA21
LTA ON RCTS (CC)	F5757	NTX213AB02
LTC NETWORK LINKS DIAGNOSTIC	F3950	NTX001AA21
LTCI WARM SWACT	F7304	NTX750AB04
LTP - DIGITONE TESTING	F0634	NTX054AA05
LTP - MONITOR,TALK,BALANCE OFFHOOK TESTS	F0635	NTX054AA05
LTP - SEND FUNCTIONS(COIN & RINGING FUNCTIONS)	F0636	NTX054AA05
LTP CIBINCOM REWRITE	F6501	NTX901AA17
MACHINE ANNOUNCEMENTS ANALOG	F0097	NTX001AA21
MADN RING FORWARD	G0083	NTXA33AA01
MADN SERVICE ORDERS	F3416	NTX106AA09
MAG TAPE UNIT FOR OM	F0270	NTX802AA04
MAG TAPE UNIT FOR OM	F0270	NTX902AA07

Feature Title	Feat	PEC
MAGNETIC TAPE HANDLER 1600 BPI	F0112	NTX001AA21
MAGNETIC TAPE LOCAL INHIBIT	F0572	NTX042AA04
MAGNETIC TAPE LOCAL INHIBIT	F0572	NTX044AA04
MAINTENANCE POSITION DIAL-UP ACCESS	F0128	NTX001AA21
MAINTENANCE POSITION LOCAL	F0129	NTX001AA21
MAINTENANCE POSITION REMOTE	F0130	NTX001AA21
MAKE SET BUSY EXCEPT GIC	F2964	NTX878AB02
MANUAL CONTROL OF SYSTEM CONFIGURATION	F0131	NTX001AA21
MANUAL LINE OR TRUNK ACCESS TESTING	F0132	NTX001AA21
MANUAL LINE(MAN ORIG/DIAL TERM)	F0246	NTX901AA17
MANUAL OR SCHEDULED AUTOMATIC TESTS	F1122	NTX136AA03
MAP ALARM LEVEL SCREENING	F3906	NTX427AA04
MAP DISPLAY FOR ATTENDANT OM	F1606	NTX100AA20
MAP LEVEL FOR NOP	F5835	NTX000AA13
MAP LINE MAINTENANCE	F3724	NTX213AB02
MASS CALLING	F0271	NTX902AA07
MASS DMO TEST PROGRAM	F1243	NTX030CC10
MASTER CLOCK SYNCHRONIZATION FOR E_CORE	F6484	NTX048AA04
MATCH COMMAND IMPROVEMENT	F5871	NTX001AA21
MCCS - CUSTOMER DIALED ON LINES	F3390	NTX171CA02
MCCS - CUSTOMER DIALED ON LINES	F3390	NTX825AA02
MCCS - CUSTOMER DIALED ON TOPS TRUNKS	F1602	NTX171CA02
MCCS - CUSTOMER DIALED ON TOPS TRUNKS	F1602	NTX825AA02
MCCS - CUSTOMER DIALED SEQUENCE CALLS	F3391	NTX171CA02
MCCS - CUSTOMER DIALED SEQUENCE CALLS	F3391	NTX825AA02
MCCS - OPERATOR ASSISTED CCV	F3395	NTX170AA01
MCCS - OPERATOR ASSISTED CCV	F3395	NTX171CA02
MCCS - OPERATOR ASSISTED CCV	F3395	NTX825AA02
MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION	F1601	NTX170AA01
MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION	F1601	NTX171CA02
MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION	F1601	NTX825AA02
MCCS - QUERY VIA OC DATA LINK	F3393	NTX286AA01
MDC CIRCUIT TEST ENHANCEMENT	G0063	NTX106AA09
MECHANIZED FORCE ADMINISTRATION DATA SYSTEM (MFADS)	F1113	NTX030BA03
MECHANIZED LINE CARD ASSIGNMENT	F2311	NTX176AA05
MEET - ME CONFERENCE (LARGE)	F1632	NTX111AA03
MEET-ME CONFERENCE	F1181	NTX100AA20
MEMORY ADMINISTRATION - NEW OM	G0116	NTX001AA21
MERIDIAN DIGITAL CENTREX ON SMS	F6407	NTX398AA10
MESSAGE RATE REMOTE CALL FORWARDING BASE DN	F2815	NTX021AA04
MESSAGE WAITING LAMP - LINK PHONE	F3413	NTX119AA02
MESSAGE WAITING LINE CARD FACILITY MNTC	F3414	NTX119AA02
MF MONITOR FOR TYPE 2A CELLULAR INTERCONNECT	G0115	NTX843AB01
MINIMUM CHARGE	F2336	NTX030CC10
MINOR POF ENHANCEMENT	F3779	NTX001AA21
MLT - ENHANCEMENT	F2499	NTX195AA05
MLT - PHASE I	F2441	NTX195AA05
MOBILE HANDLING ITMS ROAMER	F0539	NTX030CC10
MODEM POOL DATA UNIT	F3460	NTX251AA05

Feature Title	Feat	PEC
MODEM POOL TESTING	F6024	NTX251AA05
MODEM POOLING PHASE II	F3760	NTX251AA05
MONITOR TALK	F0238	NTX055AA03
MONITOR SUBROUTINE USAGE	F0920	NTX184AA09
MPC - BX.25 LEVEL2	F3839	NTX273AA07
MPC - BX.25 LEVEL3	F3838	NTX273AA07
MPC - COMMAND INTERPRETER	F3834	NTX273AA07
MPC - DATA LINK HANDLER	F3836	NTX273AA07
MPC - IOC HANDLER	F3835	NTX273AA07
MPC - OS	F3833	NTX273AA07
MPC DATAPAC X.25 PP S/W	F6061	NTX273AA07
MPC LOGS FOR IOD MAINTENANCE	F5760	NTX273AA07
MPC ROM MAINTENANCE AND CC CONTROLLER	F3832	NTX001AA21
MPC-OM CC INTERFACE TO PP AND PP DATA REGISTRATION	F7052	NTX273AA07
MPC-OM COLLECTION(CC)	F7051	NTX273AA07
MPC-OM GROUP DEFINITION/COLLECTION FOR MPCFAST SUBSYS	F6998	NTX892AA03
MPC-OM GROUP DEFINITIONS	F6999	NTX273AA07
MPC-OM PP INTERFACE TO CC	F6997	NTX273AA07
MPC-OM PP LINK DATA COLLECTION	F7053	NTX273AA07
MS MAP MMI AND LOGS ENHANCEMENTS	F6482	NTX940AA06
MS SUPPORT FOR 9X32	F6671	NTX940AA06
MSB - DTC NUC BASIC MTCE	F3100	NTX270AA12
MSB6 NEW STI CARD SUPPORT	F5499	NTX040AA03
MTA GATING FACILITY	F3353	NTX901AA17
MTCBASE PERFORMANCE ENHANCEMENTS	F7208	NTX000AA13
MTCBASE PERFORMANCE TOOLS	F7269	NTX001AA21
MTP - BERT CAPABILITY FOR STP	F6977	NTX839AA01
MTP - CONGESTION/TIMER	F6241	NTX041AA07
MTP - CONGESTION/TIMER	F6241	NTX041AB04
MTP - CONGESTION/TIMER OPTION TABLE CONTROL	F5786	NTX041AA07
MTP - CONGESTION/TIMER OPTION TABLE CONTROL	F5786	NTX041AB04
MTP - DISTRIBUTED DATA MGMT	F6267	NTX041AA07
MTP - DISTRIBUTED DATA MGMT	F6267	NTX041AB04
MTP - DISTRIBUTED LINK/ROUTE STATUS CHANGES	F6268	NTX041AA07
MTP - DISTRIBUTED LINK/ROUTE STATUS CHANGES	F6268	NTX041AB04
MTP - ROBUSTNESS IMPROVEMENTS	F6697	NTX041AB04
MTP ROBUSTNESS IMPROVEMENT	F5792	NTX041AA07
MTP ROBUSTNESS IMPROVEMENT	F5792	NTX041AB04
MULTI(4) - MSB7 CAPABILITY	F6269	NTX041AB04
MULTI-CUSTOMER OPERATION	F1214	NTX100AA20
MULTI-RATE CENTRE	F0266	NTX901AA17
MULTI-TRAFFIC OFFICE OPERATION	F0548	NTX030BA03
MULTI_PARTY BRIDGING	F6170	NTX297AA01
MULTILINK ASCII DEVICE DRIVER	F6175	NTX730AA02
MULTIPLE CONSOLE OPERATION	F0377	NTX100AA20
MULTIPLE FUNCTIONAL SIGNALLING CALLS PER DIRECTORY NUMBER	F6384	NTX753AA02
MULTIPLE LISTED DIRECTORY NUMBERS	F0378	NTX100AA20
MULTIPLE SIMULTANEOUS CALL FORWARDING	F2915	NTX806AA01

Feature Title	Feat	PEC
MULTIPLE TERMINALS FOR ISDN LOOP	F6150	NTX750AB04
MULTIUNIT MESSAGE RATE SERVICES	F2440	NTX160AA01
MUSIC-ON-HOLD FOR EBS	F2826	NTXA84AA01
MVP DIAL PLAN	F3489	NTX436AA01
M518 SUPPORT AND INTRODUCTION	F6630	NTX106AA09
M5209/M5312 DISPLAY SETS	F6586	NTX108AA05
NAILED UP CONNECTIONS	F0272	NTX802AA04
NAILED UP CONNECTIONS	F0272	NTX902AA07
NAME DISPLAY FOR MADN SECONDARY MEMBERS	F6680	NTX946AB01
NCOS AND CLID DISPLAY ON AC-II	F7183	NTXA39AA01
NETWORK ATTENDANT BUSY VERIFICATION STATIONS	F6655	NTXA39AA01
NETWORK ATTENDANT BUSY VERIFICATION STATIONS PHASE 1	F7090	NTXA39AA01
NETWORK ATTENDANT CONTROL	F7358	NTXA39AA01
NETWORK ATTENDANT RECALL	F7359	NTXA39AA01
NETWORK CAMP-ON II	F7357	NTXA39AA01
NETWORK CAMP-ON-1	F6658	NTXA39AA01
NETWORK CLID AND NCOS DISPLAY INTERACTION WITH 3WC	F7360	NTXA39AA01
NETWORK DIAL PLAN DISPLAY	F7085	NTXA00AA02
NETWORK DIAL PLAN DISPLAY	F7085	NTXA35AA03
NETWORK DIAL PLAN DISPLAY	F7085	NTX790AA03
NETWORK DISPLAY ENHANCEMENT	F7319	NTXA35AA03
NETWORK INTEGRITY ANALYSIS PACKAGE	F1471	NTX053AA05
NETWORK LINK TO LINE MODULE TESTS	F1723	NTX182AA04
NETWORK MANAGEMENT IMPROVEMENTS	F1494	NTX060AB10
NETWORK MANAGEMENT SHORT SLLI SIMPLIFICATION	F5758	NTX060AB10
NETWORK MGMT TRUNK GROUP CONTROL INTERFACE REORG	F5937	NTX060AB10
NETWORK MGMT TRUNK GROUP DATA REORGANIZATION	F5926	NTX060AB10
NETWORK NAME DISPLAY	F6677	NTXA80AA01
NETWORK NUMBER DISPLAY	F6565	NTXA35AA03
NETWORK PATH DIAGNOSTICS	F2877	NTX885AA02
NETWORK PATH DIAGNOSTICS	F2877	NTX885AB01
NETWORK RING AGAIN - CC SUPPORT	F7146	NTX791AA02
NETWORK RING AGAIN - XPM SUPPORT	F6550	NTX791AA02
NETWORK SPEED CALLING	F1750	NTX432AA01
NETWORK WIDE RING AGAIN	F6567	NTXA36AA01
NEW CC REAL TIME INDICATOR	F2942	NTX291AA04
NEW LTP LEVEL FOR DATA LINES	F6373	NTX750AB04
NEW O/G IDLE SUPREVISION	F3348	NTX001AA21
NEW PERIPHERAL POTS LINE BOARD TO BOARD TESTING	F3354	NTX057AB05
NEW PERIPHERAL POTS LINE CUTOVER SUPPORT	F3351	NTX057DA01
NEW PERIPHERAL POTS LINE CUTOVER SUPPORT	F3351	NTX057EA01
NIGHT SERVICE	FIXED	F1626
NIGHT SERVICE	FLEXIBLE	F1265
NIGHT SERVICE	TRUNK ANSWER FROM ANY STATION	F0403
NIGHT TREATMENT	F5966	NTX407AB01
NM STATUS/CONTROL I/O	F0312	NTX060AB10
NMP CUSTOMER SCREENING	F5711	NTX427AA04
NO. 2 SCC INTERFACE	F2495	NTX210AA03

Feature Title	Feat	PEC
NO.2 SCC CRITICAL INDICATOR ENHANCEMENT	F2693	NTX210AA03
NO-CALL - PROCESSING ALARM	F5722	NTX001AA21
NODE TYPE EXTENSION FOR NEW PERIPHERALS	F6153	NTX001AA21
NOISE MEASUREMENT	F1125	NTX055AC02
NON-COIN 0+, 0-	F0930	NTX030CC10
NON-DATA LINK CONSOLE CALL EXTENSION	F2953	NTX877AA01
NORTH AMERICAN CODE FORMAT	F0102	NTX001AA21
NORTH AMERICAN LOCAL AND DDD SWITCHING	F0841	NTX001AA21
NORTH AMERICAN PRECISE TONE PLAN	F0842	NTX001AA21
NORTH ELECTRIC ANI (RECEIPT AND REGENERATION)	F0611	NTX193AA01
NORTH ELECTRIC FORMAT	F1139	NTX030CC10
NOTIFY	F0961	NTX030CC10
NOTIS FORMAT FOR TROUBLE REPORT	F2374	NTX096AA01
NPA ON 0+ SEVEN DIGIT LOCAL CALLS	F2887	NTX030CC10
NPE - LCM MAINTENANCE	F3104	NTX270AA12
NPE - LGC/DTC MAINTENANCE	F3106	NTX270AA12
NPE - LM SPEECH LINK DIAGNOSTICS	F5405	NTX270AA12
NPE - MSB MAINTENANCE	F3101	NTX270AA12
NPE - OM FOR LGC/DTC	F3350	NTX270AA12
NPE - PM LOADER	F3107	NTX270AA12
NPE - REWORK OF PM MAP DISPLAY	F3331	NTX001AA21
NT - AMA/CDR TAPE DUMP UTILITY PROG (AMADUMP)	F1796	NTX178AA01
NT - AMA/CDR TAPE DUMP UTILITY PROG (AMADUMP)	F1796	NTX182AA04
NT6X50AB - MAP SUPPORT	F6505	NTX270AA12
O + SERVICE TO TOPS	F0276	NTX902AA07
O+ LOCAL CALLS ON DMS-200 TOPS	F2776	NTX030CC10
O/G TRUNK GROUP CONTROL	F0322	NTX060AB10
OFF HOOK QUEUING ENHANCED	F1182	NTX105AA03
OFF PREMISES EXTENSIONS	F0247	NTX901AA17
OFF PREMISES STATIONS AND EXTENSIONS	F0405	NTX100AA20
OFF-HOOK QUEUING	F1607	NTX105AA03
OFFICE CODE SHARING THOUSAND DIGIT TRANSLATION	F0303	NTX801AA01
OFFICE CODE SHARING- THOUSANDS DIGITS TRANSLATION	F0267	NTX901AA17
OFFICE DEPENDANT CALL DISCONNECT TREATMENT	F0202	NTX901AA17
OFFICE HARDWARE INVENTORY PACKAGE	F2350	NTX120AA01
OFFICE ID IN TTY OUTPUT HEADER LABEL	F2365	NTX001AA21
OFFICE RECORD REPORT OF WORKING SPARE TRUNK/LINES/LINE CARDS	F1203	NTX176AA05
OHQ, CBQ FOR OUTWATS VFG	F1790	NTX112AB03
OLD TABLE CONTROL ENHANCEMENTS	F6511	NTX184AA09
OM - ACT. CALL DISP OFZ	F2666	NTX001AA21
OM - DIRECTED CALL PARK	F5552	NTX100AA20
OM - DMO SELECTIVE SLU SCAN INTERVAL	F2361	NTX082AA01
OM - GROUP TOTALS	F2664	NTX445AB01
OM - OUTPUT ORDERING	F2314	NTX001AA21
OM - PC OF POTS FEATURE ACTIVATION	F2708	NTX020AC01
OM OUTPUT ROBUSTNESS	F6311	NTX001AA21
OM OUTSIDE PLANT MEASUREMENTS - PHASE I	F3825	NTX001AA21

Feature Title	Feat	PEC
OM PRINT - SUPPRESSION OF ZERO DATA	F3777	NTX001AA21
OM SELECTIVE PRINTOUT	F2578	NTX445AB01
OM TAPE - SUPPRESSION OF UNEQUIPPED MEMBERS(D RECORD)	F3776	NTX001AA21
OM TAPE PRINT UTILITY	F1683	NTX178AA01
OM THRESHOLDING AND ALARMS	F2576	NTX385AA01
OM TRANSFER PERIOD AND HISTORY CLASS ENHANCEMENTS	F2382	NTX099AA01
OM TRANSFER SPEEDUP	F5500	NTX001AA21
OM USAGE TO EADAS	F3919	NTX218AA03
OMPRT OUTPUT BUFFERING	F6312	NTX001AA21
OMS - PIC AND NON PIC CALLS PER IC/INC	F6244	NTX186AA06
OMS FOR NRAG ON PRA	F7258	NTX791AA02
OMS ON PER PM BASIS	F2667	NTX001AA21
ONI 10-PARTY	F0802	NTX901AA17
ONI 4-PARTY	F0169	NTX901AA17
ONI 8-PARTY	F0801	NTX901AA17
ONI SERVICES	F1193	NTX042AA04
ONI SERVICES	F1193	NTX044AA04
ONI SWITCHING ON ANI FAIL	F0230	NTX044AA04
ONI/ANI INDIVIDUAL	F0232	NTX901AA17
ONI/ANI 2-PARTY	F0236	NTX901AA17
OPERATIONAL MEASUREMENT (BASIC LOCAL)	F0025	NTX901AA17
OPERATIONAL MEASUREMENTS	F6654	NTX167AB04
OPERATIONAL MEASUREMENTS - IBN	F1171	NTX100AA20
OPERATOR CENTRALIZATION - HOST	F0559	NTX039AA01
OPERATOR CENTRALIZATION - REMOTE	F1317	NTXA60AA01
OPERATOR CENTRALIZATION - REMOTE	F1317	NTX134BA02
OPERATOR LOGON PASSWORD FOR TOPS-MP	F7210	NTXA90AA01
OPERATOR LOGON PASSWORD FOR TOPS-MP	F7210	NTX731AA03
OPERATOR NUMBER IDENTIFICATION (ONI) CALLS	F0931	NTX030CC10
OPERATOR VERIFICATION	F0234	NTX901AA17
OPERATOR 0-	F0103	NTX001AA21
OPERATOR/TOLL CALLS (1N1/11XX)	F0157	NTX001AA21
OPM CC MTCE SOFTWARE	F5433	NTX147AB01
OPM SCHEDULED BATTERY ROTATION	F2811	NTX147AB01
OPTIMIZE MTCCLASS TASKS	F6191	NTX000AA13
OPTION TO RECORD UNCOMPLETED CALLS	F0579	NTX042AA04
OPTION TO RECORD UNCOMPLETED CALLS	F0579	NTX044AA04
OPTIONAL ANSWER SUPERVISION FROM ATTENDANT QUEUE	F2895	NTX100AA20
OPTIONAL PARAMETER FOR DMOPRO TO SUPPRESS SUMMARY MESSAGE	F3945	NTX056AA04
OPTIONAL PRIVACY ON MADNS	F2837	NTX878AB02
OPTIONAL USE OF MPC BY NOS RO SERVICE	F6062	NTX560AA03
OPTIONAL USE OF MPC BY NOS RO SERVICE	F6062	NTX560AB02
ORIGINATING AND TERMINATING SERVICE	F0098	NTX001AA21
ORIGINATING BILLING	F5993	NTX710AA02
ORIGINATING/TERMINATING LINE SELECT	F2987	NTX878AB02
ORINATION OF 105 TEST TYPES	F1123	NTX136AA03
OUTAGE FOOTPRINT - PHASE II	F6479	NTX001AA21
OUTAGE FOOTPRINT FACILITY	F5872	NTX001AA21

Feature Title	Feat	PEC
OUTBOUND MODEM POOLING	F3173	NTX251AA05
OUTGOING MESSAGE FLOW CONTROL - CC	F7381	NTX001AA21
OUTGOING TRUNK IDLE SELECTION	F0039	NTX001AA21
OUTPULSING OVER 911 TRUNK	F0755	NTX019AA01
OUTPULSING VERIFICATION USING DMIS	F1474	NTX101AA13
OUTPUT ROUTING AND REPORTING	F0040	NTX001AA21
OUTWATS CANADA	F0342	NTX006AA04
OUTWATS U.S.A.	F0343	NTX006AA04
OUTWATS TWO DIGIT ZONE SUPPORT	F2624	NTX006AA04
OVERFLOW REGISTRATION	F0354	NTX007AB02
OVERFLOW TO: BUSY TONE	F1106	NTX007AB02
OVERFLOW TO: DIRECTORY NUMBER	F0353	NTX007AB02
OVERFLOW TO: ROUTE	F0355	NTX007AB02
OVERLAP CARRIER SELECTION	F3920	NTX186AA06
OVERLAP OUTPULSING LINE TO TRUNK	F0268	NTX902AA07
OVERLAP OUTPULSING TRUNK TO TRUNK	F2319	NTX121AA01
OVERSEAS RATING	F0537	NTX030CC10
P_PHONE LINECARD	F4411	NTX106AA09
P_PHONE MESSAGE WAITING	F1481	NTX119AA02
PARAMETER QUERY	F1681	NTX177AA01
PARMCAL VERIFICATION OF OFFICE PARAMETERS	F7056	NTX001AA21
PARTITIONED SERVICE ORDER SYSTEM	F3870	NTX412AA01
PARTITIONED SERVICE ORDER SYSTEM	F3870	NTX412BA01
PARTITIONED SERVICE ORDER SYSTEM	F3870	NTX412CA03
PARTITIONED TABLE EDITOR	F5634	NTX412CA03
PASSWORD COMMAND (SHOWPW)	F2632	NTX001AA21
PASSWORD CONTROL	F3335	NTX292AB03
PASSWORD CONTROL	F3335	NTX292BA02
PATCH DOWNLOADING	F5698	NTX001AA21
PATCH DOWNLOADING VIA X.25	G0030	NTXA11AA01
PBX FLAT RATE GROUND START	F0249	NTX901AA17
PBX FLAT RATE LOOP START	F0250	NTX901AA17
PBX MESSAGE RATE	F1195	NTX007AB02
PEG COUNT OF WARM AND COLD RESTARTS	F1319	NTX001AA21
PEG COUNT ON INWATS LINES	F0338	NTX006AA04
PEG COUNT ON TANDEM CALLS	F2270	NTX902AA07
PEG COUNTS ON LISTED DIRECTORY NUMBERS ON ATTENDANT CONSOLES	F2982	NTX856AA02
PENDING ORDER FILE DUE DATE SPECIFICATION	F0656	NTX056AA04
PENDING ORDER FILE REMINDER MESSAGE	F0657	NTX056AA04
PENDING ORDER FILE RETRIEVAL BY SERVICE	F0658	NTX056AA04
ORDER NO.		
PENDING ORDER FILE VALIDITY CHECKS	F0660	NTX056AA04
PENDING ORDER FILE ON DISK	F1135	NTX074AA06
PER CALL CAPACITY ENHANCEMENT	F3740	NTX001AA21
PER CALL LINE TESTING	F0224	NTX901AA17
PER CALL LOOP TEST ON GROUND START LINES	F2450	NTX901AA17
PER CALL TRUNK TESTING	F0070	NTX001AA21
PERIODIC REPORTING ON TRUNKS	F0630	NTX053AA05

Feature Title	Feat	PEC
PERIPHERAL STATUS CHECK REPORT BEFORE SWACT	F3965	NTX001AA21
PERIPHERAL TRUNK INTERSWITCH	F6474	NTX380AA02
PERMANENT HOLD	F1639	NTX100AA20
PERMANENT SIGNAL TIME OUT - OPEN INTERNAL	F2670	NTX901AA17
PERMANENT SIGNAL/PARTIAL DIAL LOCKOUT AND AUTOMATIC-CLEARING	F0225	NTX901AA17
PERMISSIVE 1 + DIALING	F1746	NTX001AA21
PERSON TO PERSON	F0950	NTX030CC10
PERSON TO PERSON CALL BACK	F0952	NTX030CC10
PHYSICAL LEVEL MAINTENANCE FOR FBUS	F7108	NTX833AA03
PLUG-UP FACILITY INTERCEPT	F0226	NTX901AA17
PM AUTOLOADING - PHASE II	F6154	NTX001AA21
PM AUTOLOADING PHASE I	F5953	NTX001AA21
PM EXEC TABLE CONTROL RESTRICTIONS	F5659	NTX001AA21
PM LOADS IN MAIN MEMORY	F2331	NTX077AA01
PM MAINTENANCE ENHANCEMENTS	F3895	NTX001AA21
PM MAP ENHANCEMENTS	F6983	NTXA66AA01
PM MAP ENHANCEMENTS	F5497	NTX270AA12
PM MONITOR EXEC TRACE ON PM ACTIVITY BY TM TYPE	F0919	NTX184AA09
PM TO FACILITY MAINTENANCE IMPROVEMENTS	F3879	NTX001AA21
POINT TO POINT RATING	F0992	NTX030CC10
POLLING AMA DATA VIA DATAPAC - AUTOMATIC	F1066	NTX059AB04
POLLING AMA DATA VIA DATAPAC - MANUAL	F0670	NTX059AB04
POSITION AND DISPLAY	F0321	NTX060AB10
POSITION BUSY	F1176	NTX100AA20
POSITION OCCUPANCY MEASUREMENT	F2328	NTX030BA03
PP DIGITAL TEST HEAD	F3911	NTX213AB02
PRA INTERWORKING WITH DMS TRUNK GROUP TYPES	F7350	NTX790AA03
PRA INTERWORKING WITH SL-100 AGENCIES I	F6600	NTX790AA03
PRA/CCS7 INTERWORKING	F6549	NTX790AA03
PRA/CCS7 NETWORK RING AGAIN	F7325	NTX791AA02
PRE-SELECTED ALTERNATE MASTER/SLAVE (PAMS) OPERATION	F0593	NTX048AA04
PRECEDENCE CALL TRANSFER	F1634	NTX113AA01
PREFCT TOOL	F6189	NTX001AA21
PREFIX CODES CONTROL	F6347	NTX060AB10
PREFIX DIGIT	F0942	NTX030CC10
PREMIUM DIALLING (01+) (U.S)	F1032	NTX072AA01
PREPAY COIN FIRST	F0191	NTX901AA17
PREPAY DIALTONE FIRST	F0192	NTX901AA17
PRESET CONFERENCE	F1880	NTX260AA02
PRESUBSCRIPTION INDICATOR	F2886	NTX711AA02
PRESUBSCRIPTION INDICATOR	F2886	NTX711AB02
PREVENTATIVE CYCLICAL RETRANSMISSION	F6975	NTXE32AA01
PRINTOUT LETTERS IN SYSTEM - ALL, IDLE, PROCS, OWNERS	F0918	NTX184AA09
PRINTOUT ON ANI FAILURE	F0583	NTX044AA04
PRIORITY MAP TERMINAL	F1888	NTX001AA21
PRIVACY RELEASE CONFERENCE CONTROL	F2889	NTX878AB02
PRIVATE VIRTUAL NETWORKING	F7121	NTX983AA01
PROFILE ENHANCEMENT	F6323	NTX250AA12

Feature Title	Feat	PEC
PROGRAM STORE-OPTIMIZED OPCODES	F1675	NTX184AA09
PROGRAMMABLE POWER/MISC ALARM	F2904	NTX398AA10
PROGRAMMABLE SPARE ALARMS FOR RCU	F6304	NTX387AA04
PROTECTION OF UNEXPIRED TAPES	F2817	NTX001AA21
PROTECTIVE RESERVATION EQPT (PRE)	F0325	NTX060AB10
PROTECTIVE RESERVATION EQPT INCREASED NO.OF RESERVED TRKS	F2250	NTX060AB10
PROTOCOL SUPPROT BX25	F3913	NTX273AA07
PROVIDE DIRECTORY OF PP EXECUTIVE PROGRAMS	F0916	NTX184AA09
PROVISION OF 2048 TRUNK GROUPS (1-WAY & 2-WAY)	F0809	NTX001AA21
PSEUDO HOTEL NXX TABLES	F2700	NTX030CC10
PTS TO CCS7 MASS TRUNK CONVERSION	F2945	NTX875AA01
PURPLE BOX WIRE TAP	F0185	NTX901AA17
QUERY AND DEFINE COMMAND CLASSES	F0913	NTX001AA21
QUERY COMMAND ENHANCEMENTS	F5699	NTX001AA21
QUERY FUNCTIONAL STATION GROUPINGS	F2795	NTX100AA20
QUEUE SELECTION ON TRUNK GROUP BASE	F2775	NTX030CC10
RACK MOUNT DU EIA CONTROLLED LP BACK	F6079	NTX250AA12
RACK MOUNT DVS (LS AND HS)	F5550	NTX250AA12
RADR FOR UTR	F5726	NTX269AA07
RADR WITH DTMF	F3499	NTX001AA21
RANDOM CONDITIONAL ROUTING	F3492	NTX437AA01
RATE PERIOD SPECIFIC BILLING	F2373	NTX030CC10
RATING MASS DMO	F1013	NTX030CC10
RCC C-SIDE NON CONSECUTIVE LINKS	F6571	NTX145AA05
RCC CSIDE LINK DIAGNOSTIC	F6090	NTX145AA05
RCC LINE INTRASWITCHING PADS	F6285	NTX150AA03
RCF ENHANCEMENTS	F2505	NTX021AA04
RCT AND RCS INVENTORY TABLE	F3886	NTX398AA10
RCU CARRIER MAINTENANCE ENHANCEMENTS	F6173	NTX387AA04
RCV OFFICE PARAMETER	F6406	NTX387AA04
REA REVERTIVE CALLING	F1305	NTX049AD01
RECEIPT OF BELL ANI FORMAT	F0584	NTX044AA04
RECEIVE/OUTPULSE UP TO 15 DIGITS	F0104	NTX001AA21
RECEIVER OFF-HOOK TREATMENT	F0186	NTX901AA17
RECORDING DATA TIMER DUMP	G0120	NTXA89AA01
REDUCED SILC GAPPIG INTERVAL	F6027	NTX060BA02
REDUCED SILC GAPPIG INTERVAL	F6027	NTX060BB01
REFORMATING OF DATA TABLE CONTENTS BETWEEN SOFTWARE LOADS	F1730	NTX030CC10
REFORMATING OF DATA TABLE CONTENTS BETWEEN SOFTWARE LOADS	F1730	NTX183AA04
REGENERATIVE ANI BELL FORMAT	F2139	NTX192AA01
REMOTE ACD LOAD MANAGEMENT	F6517	NTXA52AA01
REMOTE ACD LOAD MANAGEMENT	F6517	NTXA52AB01
REMOTE ACD SHOW	F6516	NTXA52AB01
REMOTE CALL FORWARDING - CAMA MODE	F1238	NTX021AA04
REMOTE CALL FORWARDING - LAMA MODE	F1027	NTX021AA04
REMOTE LINES WITH HOST OFFICE FEATURES	F0720	NTX023AB03

Feature Title	Feat	PEC
REMOTE MAKE BUSY	F0736	NTX053AA05
REMOTE MAKE BUSY VIA SCAN POINT	F2565	NTX395AA01
REMOTE ONI TO SP-1 TOPS	F0564	NTX042AA04
REMOTE ONI TO SP-1 TOPS	F0564	NTX044AA04
REMOTE ONI TO WE TSPS	F0565	NTX042AA04
REMOTE ONI TO WE TSPS	F0565	NTX044AA04
REMOTE ONI VIA O.C.	F2602	NTXA60AA01
REMOTE ONI VIA O.C.	F2602	NTX035AA03
REMOTE ONI VIA O.C.	F2602	NTX134BA02
REMOTE ONI VIA O.C.	F2602	NTX871AA01
REMOTE SONALERT FOR TOPS-MP	F7204	NTXA90AA01
REMOTE SONALERT FOR TOPS-MP	F7204	NTX731AA03
REMOTE SUBSCRIBER LINE OVERFLOW REGISTRATION	F0357	NTX007AB02
REMOTE SURVEILLANCE AND CONTROL	F2513	NTX210AA03
REMOTE TOPS MAINTENANCE	F0542	NTX030BA03
REMOTE TOPS MP O.C.-DATA LINK HANDLING	F2938	NTX871AA01
REMOTED ADMINISTRATION	F0092	NTX001AA21
RENAME ATT AMA TO BC AMA	F5549	NTX159AA06
REORDER PURGE - IBN	F2710	NTX001AA21
REPEAT TWO TEST	F1084	NTX802AA04
RES DIGIT COLLECTION ARRANGEMENTS	F6536	NTXA64AA03
RES FEATURE SET EXPANSION 1	F6960	NTXA64AA03
RES FEATURE SET EXPANSION 2	F6961	NTXA64AA03
RES FEATURE TRANSPARENCY	F6535	NTXA64AA03
RES/CLASS SERVICE ORDER SIMPLIFICATION AND OA AND M	F7234	NTXA64AA03
RESIDENTIAL ENHANCED SERVICES (RES)	F6534	NTXA64AA03
RESOURCE SELECTOR OVERRIDE	F6325	NTX251AA05
RETENTION TEST OF ALLOCATED MEMORY	F5652	NTX001AA21
REVERTIVE CALL PEG COUNT REGISTER	F2269	NTX901AA17
REVERTIVE CALLING - RINGING TO BOTH PARTIES ON 4 PARTY ONI	F2606	NTX901AA17
REVERTIVE CALLS SELECTIVE ANNOUNCEMENT	F2394	NTX001AA21
REVERTIVE CALLS 7 DIGIT DIALLED (2-PARTY)	F0204	NTX901AA17
REVERTIVE CALLS 7 DIGITS DIALLED (MULTI-PARTY)	F0205	NTX901AA17
REVERTIVE PULSING SIGNALLING ON DTC	F2420	NTX139AA01
REVERTIVE RINGING MULTI-PARTY	F0260	NTX901AA17
REVERTIVE RINGING NO REVERTIVE RING	F0827	NTX901AA17
REVERTIVE RINGING 2-PARTY	F0261	NTX901AA17
REWRITE IBN CALL FORWARDING	F3804	NTX413AA01
RING AGAIN	F1151	NTX100AA20
RING AGAIN ON IDLE EBS	F2963	NTX878AB02
RING BACK	F0061	NTX001AA21
RING DOWN TRUNK FOR 911 SERVICE	F0446	NTX019AA01
RING FORWARD	F0062	NTX001AA21
RINGBACK	F0018	NTX901AA17
RINGBACK CODED RINGING	F0756	NTX019AA01
RINGBACK TIMED (FREQUENCY RINGING)	F1155	NTX019AA01
RLCM - ESA MAINTENANCE SUPPORT	F3406	NTX154AA03

Feature Title	Feat	PEC
RLCM - INTRA SWITCHING	F1453	NTX156AA02
RLCM BASIC	F1420	NTX146AA03
RLCM ESA - BASIC PM MAINTENANCE	F1447	NTX149AA02
RLCM ESA - BASIC PM MAINTENANCE	F1447	NTX149AB02
RLCM ESA - CALL CONTROL	F1452	NTX154AA03
RLCM ESA - TABLE CONTROL	F1451	NTX154AA03
RLCM FACILITY MAINTENANCE	F1424	NTX146AA03
RLCM INTRASWITCHED END TO END SIGNALLING	F5915	NTX156AA02
RLCM INTRASWITCHING	F5579	NTX156AA02
RLCM MAINTENANCE	F1423	NTX146AA03
RLCM OFF RCC	F6287	NTX381AA01
RLCM RMM MAINTENANCE	F1426	NTX146AA03
RLCM-ESA - SINGLE PROCESSOR CONFIGURATION	F5474	NTX154AA03
RLCM-LTC-SPCH PATH DIAG. ENHANCEMENT	F3949	NTX146AA03
RLCM/RCE ESA CHANNEL CAPACITY INCREASE	F6303	NTX149AA02
RLCM/RCE ESA CHANNEL CAPACITY INCREASE	F6303	NTX149AB02
RLCM/RCE ESA CHANNEL CAPACITY INCREASE	F6303	NTX154AA03
RLM - INTERFACE WITH #3 LTC	F0717	NTX023AB03
RLM - INTERFACE WITH BADGER 612A	F0716	NTX023AB03
RLM MAINTENANCE	F0707	NTX023AB03
RLM SIGNAL PROCESSING STORE SAVING	F5752	NTX001AA21
RLM-INTRA CALLING FOR POTS CALLS	F0475	NTX024AA01
ROBUSTIFICATION OF CARRIER MAINTENANCE	F5702	NTX001AA21
ROBUSTIFICATION OF LM/RLM MAINTENANCE	F5701	NTX001AA21
ROBUSTIFICATION OF NETWORK MAINTENANCE	F5704	NTX001AA21
ROH TONES	F0111	NTX901AA17
RONI /CKO FUNCTION	F2172	NTX035AA03
RONI TRUNK TESTING	F2431	NTX055BA01
ROTL TRUNK NUMBER TABLE	F3756	NTX052AB02
ROUTE CONTROLS CANCEL FROM	F0326	NTX060AB10
ROUTE CONTROLS CANCEL TO	F0789	NTX060AB10
ROUTE CONTROLS KEY REROUTE	F0323	NTX060AB10
ROUTE CONTROLS SKIP REROUTE	F0790	NTX060AB10
ROUTE TRANSFER	F0282	NTX902AA07
ROUTE TRANSFER RONI/CAMA POSITIONS	F0314	NTX044AA04
ROUTINE TESTING	F0135	NTX001AA21
ROUTING ACROSS NPA BOUNDARIES	F0304	NTX801AA01
RSB LINE MAINTENANCE	F3723	NTX213AB02
RSC - ESA TABLE CONTROL	F1387	NTX149AA02
RSC - ESA TABLE CONTROL	F1387	NTX149AB02
RSC - ESA TRANSLATION	F1383	NTX149AA02
RSC - ESA TRANSLATION	F1383	NTX149AB02
RSC - ESA TRANSLATION VERIFICATION DOCUMENTATION	F6344	NTX149AB02
RSC - ESA TRUNK CALL PROCESSING	F1382	NTX149AB02
RSC - INTRA SWITCHING	F1390	NTX150AA03
RSC - INTRA SWITCHING OMS	F5508	NTX150AA03
RSC - RCC TRUNK CALL PROCESSING	F1406	NTX152AB01
RSC - ROUTING CONTROL	F1407	NTX152AB01
RSC - TRUNK INTEGRATION	F5894	NTX149AB02

Feature Title	Feat	PEC
RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BASIC SERVICE	F1378	NTX149AA02
RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BASIC SERVICE	F1378	NTX149AB02
RSC ESA - AUTO UPDATE OF SUBSCRIBER/TRANSLATION DATA VIA DOW	F1386	NTX149AA02
RSC ESA - AUTO UPDATE OF SUBSCRIBER/TRANSLATION DATA VIA DOW	F1386	NTX149AB02
RSC ESA TRUNK TRANSLATION	F6042	NTX149AB02
RSC INTRA SWITCHING LINES	F1388	NTX150AA03
RSC INTRASWITCHED END TO END SIGNALLING	F5938	NTX150AA03
RSC LINE TESTING USING LTU	F1371	NTX145AA05
RSC MAINTENANCE	F1357	NTX145AA05
RSC METALIC LINE TESTING	F1370	NTX145AA05
RSC OPERATIONAL MEASUREMENTS	F1366	NTX145AA05
RSC RMM MAINTENANCE	F1360	NTX145AA05
RSC SIGNALLING CHANNEL SUPERVISION	F1361	NTX145AA05
RSC TRUNK INTASWITCHING DYNAMIC CHANNELS	F1389	NTX152AB01
RSC TRUNK WARM SWACT	F5767	NTX145AA05
RSC T1 MAINTENANCE	F1358	NTX145AA05
RSC-ESA - STATIC DATA HANDLING IN XPM	F5769	NTX149AA02
RSC-ESA - STATIC DATA HANDLING IN XPM	F5769	NTX149AB02
RTP ROBUSTNESS	F5830	NTX054AA05
S.A.INCREASEED SAMPLE RATE	F2579	NTX065AA10
S/W PROTECTION FOR NON-RES TAPES	F2423	NTX184AA09
SANITY CHECK OUT	F3884	NTX000AA13
SCCP	F5771	NTX041AA07
SCCP	F5771	NTX041AB04
SCCP - FOR DMS SCP	F6301	NTX041AA07
SCCP - FOR DMS SCP	F6301	NTX041AB04
SCCP - MMI EVOLUTION FOR STP	F6457	NTX041AA07
SCCP - MMI EVOLUTION FOR STP	F6457	NTX041AB04
SCCP MANAGEMENT ROBUSTNESS	F6698	NTX041AB04
SCCP-AUDITS AND ENHANCEMENTS	F6212	NTX041AA07
SCCP-AUDITS AND ENHANCEMENTS	F6212	NTX041AB04
SCHEDULED CC/CM PATCH APPLICATION/IMAGE	F7119	NTX001AA21
SCHEDULED TESTING OF DMS NETWORK	F2876	NTX885AB01
SCHEDULED XPM PATCH APPLICATION	F7118	NTX001AA21
SCM - BOARD TO BOARD SUPPORT FOR RCS	F5532	NTX398AA10
SCM - PP SMR WARM SWACT	F5533	NTX213AB02
SCM - PP SMS WARM SWACT	F5534	NTX398AA10
SCM - SMS SPECIAL SERVICES	F5509	NTX299AA02
SCM - SMS SPECIAL SERVICES	F5509	NTX299AB01
SCM - 100R PP CALL PROCESSING	F3310	NTX213AB02
SCM - 100R PP COIN FUNCTIONS	F3480	NTX213AB02
SCM - 100R 2 PARTY ANI	F3479	NTX213AB02
SCM - 100S CC CALL PROCESSING	F3746	NTX398AA10
SCM - 100S CC MAINTENANCE	F3748	NTX398AA10
SCM LINE MONITOR ACCESS	F6333	NTX195AA05

Feature Title	Feat	PEC
SCM-100 OPERATOR VERIFICATION	F3478	NTX213AB02
SCM-100 OPERATOR VERIFICATION	F3478	NTX398AA10
SCM-100R ADMINISTRATION	F3309	NTX213AB02
SCM-100R CC ALARMS	F3304	NTX213AB02
SCM-100R CC CALL PROCESSING	F3300	NTX213AB02
SCM-100R CC MAINTENANCE	F3302	NTX213AB02
SCM-100R CC PROTECTION SWITCHING FOR SMR	F3308	NTX213AB02
SCM-100R LOGS	F3307	NTX213AB02
SCM-100R OPERATIONAL MEASUREMENTS	F3306	NTX213AB02
SCM-100R PP MAINTENANCE	F3303	NTX213AB02
SCM-100R PP PROTECTION SWITCHING	F3912	NTX213AB02
SCM-100S-FREQUENCY SELECTIVE RINGING	F2919	NTX398AA10
SCMR DYNAMIC CHANNEL REASSIGNMENT	F2797	NTX213AB02
SCM100R - OM AND DTSR SUPPORT FOR SMR	F5455	NTX213AB02
SCM100R - SMR OVERLOAD CONTROL	F5458	NTX213AB02
SCM100R - SMR PM MAINTENANCE - PHASE II	F5456	NTX213AB02
SEAS - TABLE CONTROL REPORTING	F7362	NTX835AA01
SEAS DATA COLLECTION II	F7348	NTX835AA01
SECOND AND THIRD RECORDED ANNOUNCEMENT	G0090	NTX101AA13
SECONDARY MADN CALL FORWARDING	G0085	NTXA72AA01
SECURITY	F0774	NTX100AA20
SECURITY TABLE ENHANCEMENTS	F3854	NTX292AB03
SECURITY TABLE ENHANCEMENTS	F3854	NTX292BA02
SEI SUPERVISOR	F6057	NTX215AA02
SELECTIVE CALL SCREENING ANI ID-7	F2348	NTX030CC10
SELECTIVE DYNAMIC OVERLOAD CONTROL (SDOC)	F0673	NTX060BA02
SELECTIVE DYNAMIC OVERLOAD CONTROL (SDOC)	F0673	NTX060BB01
SELECTIVE INCOMING LOAD CONTROL(SILC)	F3705	NTX060BA02
SELECTIVE INCOMING LOAD CONTROL(SILC)	F3705	NTX060BB01
SELECTIVE ROUTING	F0031	NTX019AA01
SELECTIVE TRUNK RESERVATION (STR)	F0674	NTX060BA02
SELECTIVE TRUNK RESERVATION (STR)	F0674	NTX060BB01
SEMI AUTOMATIC DIRP DISK TO TAPE COPY	F3742	NTX074AA06
SEMI AUTOMATIC ZENITH TOPS	F2332	NTX030CC10
SEMI-AUTOMATIC TRUNK TESTING	F0136	NTX001AA21
SEMI-POST PAY	F0196	NTX901AA17
SEPARATE SMDR OUTPUT FILES BY CUSTOMER GROUP	F2399	NTX103AA09
SEPARATED OUTPUT FILE FOR IBN SMDR AND AMA	F2368	NTX103AA09
SEQUENTIAL TRUNK SELECTION	F2515	NTX244AA02
SEQUENTIAL TRUNK SELECTION	F2515	NTX244AB01
SEQUENTIAL TRUNK SELECTION REALTIME IMPROVEMENTS	F3947	NTX244AA02
SEQUENTIAL TRUNK SELECTION REALTIME IMPROVEMENTS	F3947	NTX244AB01
SERIAL CALL	F1177	NTX100AA20
SERVICE ANALYSIS LINES	F0689	NTX065AA10
SERVICE ANALYSIS MONITOR LINK DIAL BACK	F2309	NTX065AA10
SERVICE ANALYSIS TOPS	F0553	NTX065AA10
SERVICE ANALYSIS TRUNKS	F0690	NTX065AA10
SERVICE ANALYSIS DMS-300	F3010	NTX065AA10
SERVICE ANALYSIS FOR ATC TRUNKS	G0070	NTX065AA10

Feature Title	Feat	PEC
SERVICE ANALYSIS FOR IBN	F3788	NTX418AA01
SERVICE CODE 1150	F0937	NTX030CC10
SERVICE CODE 1155	F0938	NTX030CC10
SERVICE CODE 1156	F0939	NTX030CC10
SERVICE CODE 1158	F0940	NTX030CC10
SERVICE CODE 1159	F0941	NTX030CC10
SERVICE CODE 121 (INWARD)	F0935	NTX030CC10
SERVICE CODE 181	F0936	NTX030CC10
SERVICE CODE N11	F0100	NTX001AA21
SERVICE CODES 11X 410X	F0166	NTX902AA07
SERVICE ORDER ECHOING OF DMO-S (CABLE PAIR)	F0653	NTX056AA04
SERVICE ORDER FOR RCF	F1798	NTX021AA04
SERVICE ORDER SYSTEM	F1263	NTX100AA20
SERVICE ORDERS FOR FOR ISDN TERMINALS	F6146	NTX750AB04
SERVICE PARAMETERS	F6572	NTX750AB04
SERVORD INTERFACE FOR NOS	F5878	NTX563AA03
SES CALL DETAILS	F6056	NTX215AA02
SES FEATURE GROUP B EVALUATION	G0074	NTX215AA02
SES TRAFFIC DATA COLLECTION	F6053	NTX215AA02
SES VOICE LINK BRIDGING AND RELEASE-CALL PROCESSING	F6050	NTX215AA02
SES VOICE LINK MAINTENANCE	F6049	NTX215AA02
SHARED METALLIC TEST ACCESS	F6172	NTX387AA04
SHORT HUNT ON BUSINESS SET	F2720	NTX106AA09
SIGNALLING CHANNEL SUPERVISION	F1197	NTX023AB03
SIGNALLING CONVERSION	F5992	NTX710AA02
SILC DATABASE ROBUSTNESS	F6058	NTX060BA02
SILC DATABASE ROBUSTNESS	F6058	NTX060BB01
SILENT SWITCHMAN	F2210	NTX053AA05
SIMPLIFIED DIALLING	F1230	NTX100AA20
SIMPLIFIED MESSAGE DESK INTERFACE (SMDI)	F2881	NTX732AA02
SINGING POINT TEST	F2200	NTX055AC02
SINGLE PARTY REVERTIVE CALLING (INTERCOM)	F0598	NTX049AD01
SINGLE TRAFFIC OFF. OPERATION BASIC OPERATOR FEEDBACK	F1006	NTX030BA03
SIX PORT CONT AS 2-THREE PORT CONT CKT	F3812	NTX001AA21
SL-1 INTERWORKING	F1262	NTX250AA12
SLC-96-CC LINES MTCE	F5413	NTX398AA10
SLC-96-CC PM MAINTENANCE	F5411	NTX398AA10
SLC-96-CC PROTECTION SWITCHING	F5412	NTX398AA10
SLC96 - DTSR FOR LINES ON A RCS	F5461	NTX398AA10
SLC96 - SMC MAINTENANCE - MODE II	F5466	NTX398AA10
SLC96 - SMS ANI AND COIN FUNCTIONS	F5462	NTX398AA10
SLC96 - SMS P-SIDE CHANNEL MANAGEMENT	F5463	NTX398AA10
SLC96 - SMS PROTECTION SWITCHING	F5464	NTX398AA10
SLEEVE LEAD CONTROL ORIGINATING AND TERMINATING	F2264	NTX902AA07
SLEEVE LEADS FOR PUBLIC FIRE REPORTING SYSTEM	F0273	NTX902AA07
SLM CONTROL ENHANCEMENT	F6694	NTX942AA04
SLM DIAGNOSTIC ENHANCEMENTS	F7106	NTX942AA04
SLM FILE SYSTEM PHASE 2	F7105	NTX942AA04

Feature Title	Feat	PEC
SMDI CALL RETRIEVAL BILLING	F2948	NTX732AA02
SMDR VIA RAO - BELLCORE AMA RECORD	F2923	NTX851AA01
SMS - MAINTENANCE AND TABLE CONTROL FOR NAILED-UP SPECIAL	F3982	NTX299AA02
SMS - MAINTENANCE AND TABLE CONTROL FOR NAILED-UP SPECIAL	F3982	NTX299AB01
SMS A/B BOARD DIAGNOSTICS FIRMWARE	F5419	NTX398AA10
SMS DS-1 BOARD DIAGNOSTICS FIRMWARE	F5420	NTX398AA10
SMS MAINTENANCE - FIRMWARE	F5417	NTX398AA10
SMS MESSAGING MODE I,III, FIRMWARE	F5418	NTX398AA10
SMS PROTECTION SWITCH ROBUSTNESS PHASE I	F5949	NTX398AA10
SMS RINGING - FIRMWARE	F5415	NTX398AA10
SMS SUBSCRIBER LINE TEST - FIRMWARE	F5416	NTX398AA10
SMU ALARMS/CHANNEL REASSIGNMENT	F6018	NTX387AA04
SMU AUTOMATIC BOARD-TO-BOARD TEST	F6169	NTX387AA04
SMU BASIC RTS	F6015	NTX387AA04
SMU CALL PROCESSING MODE AND LINE MNTCE	F6016	NTX387AA04
SMU CC MMI	F6014	NTX387AA04
SMU COIN CAPABILITY	F6221	NTX387AA04
SMU EXPANDED RCU CONNECTIONS(PP)	F6253	NTX387AA04
SMU FORWARD DISCONNECT(PP)	F6252	NTX387AA04
SMU FXB HAIRPIN SPECIAL SERVICES	F6254	NTX621AA02
SMU IBN	F6171	NTX387AA04
SMU LINE MTCE - COIN, FXB (PP)	F6251	NTX387AA04
SMU MAINTENANCE AND OMS	F6017	NTX387AA04
SMU OAM ENHANCEMENT	F6020	NTX387AA04
SMU WARM SWACT (PP)	F6217	NTX387AA04
SO - SYSTEM RESPONSE TO QDN	F2686	NTX901AA17
SOFTWARE CONTROLLED CUTOVER OF LINES	F0668	NTX057DA01
SOFTWARE CONTROLLED CUTOVER OF LINES	F0668	NTX057EA01
SOFTWARE SECURITY - NT1X67 TERM CONTROLLER IMPROVEMENTS SPECIAL BILLING	F5467	NTX001AA21
SPECIAL BILLING CODES	F1110	NTX030CC10
SPECIAL INTERCEPT THROUGH SERVICE ORDER	F0299	NTX801AA01
SPECIAL VERIFY AVERAGE WORK TIME (AWT) ENHANCEMENT	F2461	NTX100AA20
SPEED CALLING GROUP-LONG LIST	G0058	NTXA28AA02
SPEED CALLING INDIVIDUAL-LONG LIST	F0419	NTX100AA20
SPEED CALLING INDIVIDUAL-SHORT LIST	F0417	NTX100AA20
SPEED CALLING LONG LIST	F0416	NTX100AA20
SPEED CALLING SHORT LIST	F1023	NTX020AC01
SPEEDUP C1 DIRECTORIES	F1022	NTX020AC01
SPEPCIAL/NAILED UP CONNECTIONS	F5916	NTX001AA21
SPMS - CUSTOMER CONFIGURATION	F6596	NTXA69AA01
SPMS ENHANCEMENT	F6310	NTX738AA03
SSM HAIRPIN	F6443	NTX738AA03
SS7 MTP LINKSET MANAGEMENT	F6255	NTX621AA02
STATION ACTIVATED DND WITH FEATURE ACTIVE REMINDER	F7112	NTX833AA03
STATION ACTIVATION OF CFW BUSY/DONT ANSWER	F3782	NTX435AA02
STATION CONTROLLED CONFERENCE (LARGE)	G0018	NTX857AA01
	F1633	NTX111AA03

Feature Title	Feat	PEC
STATION CONTROLLED CONFERENCE (MAX 6 PORTS)	F1640	NTX100AA20
STATION MESSAGE DETAIL RECORDING	F0425	NTX102AA04
STATION MESSAGE WAITING	F1479	NTX119AA02
STATION RINGER TEST	F0228	NTX901AA17
STATION RINGER TEST - 3 DIGIT ACCESS CODE	F2623	NTX901AA17
STATION SPECIFIC AUTH CODES	F2725	NTX103BA02
STATION SPECIFIC AUTHCODE - CDC ENHANCEMENT	F6587	NTX103BA02
STATION TO STATION	F0949	NTX030CC10
STATION TO STATION (011+) (U.S)	F1033	NTX072AA01
STATION TO STATION CALLING	F0407	NTX100AA20
STAT100 FEATURES IBN EXPANDED SPEED CALL LISTS	F6522	NTX100AA20
STORING OF 24 DIALED DIGITS	F3451	NTX100AA20
STP - LIM CLOCK DIAGNOSTIC	F6613	NTX833AA03
STP - LIM RATE ADAPTER DIAGNOSTICS	F6612	NTX833AA03
STP - MESSAGE TRANSFER PART	F6679	NTX833AA03
STP - SEAS DELAYED ACTIVATION COMMANDS	F7148	NTX835AA01
STP GATEWAY	F7194	NTX840AA01
STP LIM LOCAL CONTROL	F7114	NTX833AA03
STP LIM MAP	F7116	NTX833AA03
STP LIM MMI	F7115	NTX833AA03
STP MTP CAPABILITY CODES	F6979	NTX833AA03
STP MTP ROUTESET MANAGEMENT	F6978	NTX833AA03
STP STP LIU7 MAINTENANCE	F7111	NTX833AA03
STRAIGHTFORWARD OUTWARD COMPLETION	F0379	NTX100AA20
STRATUM - 3 CLOCK SYNCHONIZATION	F6238	NTX048BA02
STRATUM II - DRIFT INDICATION	F2828	NTX048CA02
STS CONVERSION	F3433	NTX055AB03
STUCK SENDER FEATURE ON OUTGOING TRUNKS	F0137	NTX055AA03
STUTTERED DIAL TONE FOR MESSAGE WAITING	F3446	NTX119AA02
SUBSCRIBER LINE PEG COUNT MEASUREMENT	F2268	NTX082AA01
SUBSCRIBER LINE USAGE REGISTERS	F0090	NTX082AA01
SUBSTITUTE DIGITS (UP TO 11)	F0808	NTX001AA21
SUPER CAMA TRAVER HANDLING	F6264	NTX710AA02
SUPER CC SYNC AND LDMATE	F7088	NTX000AA13
SUPERIMPOSED 4-PARTY FULLY SELECTIVE	F0263	NTX901AA17
SUPERIMPOSED 8-PARTY SEMI SELECTIVE	F0828	NTX901AA17
SW CONTROL OF CUT-OFF RELAY ON POSTED LINES	F0638	NTX054AA05
SWITCH BER INDICATOR	F6355	NTX881AA01
SWITCH BER INDICATOR	F6355	NTX881AB02
SWITCH BER INDICATOR	F6355	NTX881AC02
SWITCH BER INDICATOR FOR TRUNKS	F6448	NTX881AB02
SWITCH BER INDICATOR FOR TRUNKS	F6448	NTX881AC02
SWITCH BER INDICATOR FOR TRUNKS	F6448	NTX882AA03
SWITCHED ACCESS FROM OPERATOR (NON-COIN)	F0307	NTX801AA01
SWITCHED ACCESS TO OPERATOR (NON-COIN)	F0308	NTX801AA01
SWITCHED LOOP OPERATION	F0380	NTX100AA20
SWITCHED MF/DP PULSE CONVERSION	F0298	NTX801AA01
SYNC CLOCK MAINTENANCE	F5989	NTX048AA04
SYNCHRONIZATION - STRATUM 2	F2557	NTX048CA02

Feature Title	Feat	PEC
SYNCHRONIZATION - STRATUM 3	F2540	NTX048BA02
SYNCHRONIZATION DISPLAY AND CONTROL	F0743	NTX048AA04
SYSTEM AUDIT PACKAGE - VERSION 1	F1674	NTX184AA09
SYSTEM SPEED UP	F3824	NTX001AA21
SYSTEM STATUS DISPLAY	F0138	NTX001AA21
TABLE CONTROL - ISA ROUTING	F6540	NTX790AA03
TABLE CONTROL - LTCALLS	F6546	NTX790AA03
TABLE CONTROL - PRA TRUNKS	F6396	NTX790AA03
TABLE CONTROL - XPM/CC CONNECTION	F6547	NTX790AA03
TABLE CONTROL FOR ISDN BRA FUNCTIONAL SIGNALLING	F6389	NTX750AB04
TABLE CONTROL FOR SES SYSTEM TABLE SES DATA	F6051	NTX215AA02
TABLE CONTROL FOR STP LIM	F7154	NTX833AA03
TABLE FOR DUMP/RESTORE OF LOGIN CONTROL DATA	F6159	NTX001AA21
TABLES, MAINTENANCE I/O FILE SYSTEM	F3914	NTX273AA07
TAKE OVER/TAKE BACK	F1384	NTX149AA02
TAKE OVER/TAKE BACK	F1384	NTX149AB02
TALK OVER TRUNK UNDER TEST	F0851	NTX055AA03
TANDEM NETWORK RING AGAIN ON PRA	F7229	NTX791AA02
TANDEM SWITCHING OF SPECIAL SERVICE CIRCUITS	F0408	NTX100AA20
TANDEM SWITCHING- NO DIGITS INCOMING (2WAY TRUNKS)	F0289	NTX802AA04
TANDEM SWITCHING- NO DIGITS INCOMING (2WAY TRUNKS)	F0289	NTX902AA07
TANDEM SWITCHING-NO DIGITS INCOMING (1-WAY TRUNKS)	F0290	NTX802AA04
TANDEM SWITCHING-NO DIGITS INCOMING (1-WAY TRUNKS)	F0290	NTX902AA07
TANDEMING/SUPERVISION AND TREATMENT UPON ATB	F2533	NTX290AA01
TAPE COPY UTILITY	F1677	NTX177AA01
TAPE DIRECTORY PRESERVATION UTILITY	F1678	NTX177AA01
TATS CTRSIM	F1669	NTX184AA09
TATS TRAFSIM	F1670	NTX184AA09
TCAP	F5787	NTX550AA02
TCM SYNC LOSS IDENTIFICATION	F2995	NTX250AA12
TEEN SERVICE	F2547	NTX219AB03
TEEN SERVICE - SELECTIVE CFW	F6521	NTX219AB03
TEEN SERVICE ENHANCEMENT	G0073	NTX219AB03
TEEN SERVICE ON RES	G0106	NTXA64AA03
TERMINAL HANDLING S/W FOR TOPS MP	F5974	NTXA90AA01
TERMINAL HANDLING S/W FOR TOPS MP	F5974	NTX731AA03
TERMINAL TYPES EXTENSION	F5432	NTX001AA21
TERMINATING NPA AMA RECORDS	F3473	NTX001AA21
TERMINATING NPA IN AMA RECORDS	F3768	NTX001AA21
TEST ACCESS OF INDIVIDUAL LINES IN A HUNT GROUP	F2585	NTX901AA17
TEST ACCESS VIA 660 CONCENTRATOR	F2472	NTX901AA17
TEST ASSIGNED/UNASSIGNED LEN(HOST & RLM)	F2493	NTX901AA17
TEST LINES: LOOP AROUND	F2281	NTX801AA01
TEST LINES: LOOP AROUND	F2281	NTX901AA17
TEST LINES: OPEN CIRCUIT TERMINATION	F0223	NTX801AA01
TEST LINES: OPEN CIRCUIT TERMINATION	F0223	NTX901AA17
TEST LINES: SHORT CIRCUIT TERMINATION	F0227	NTX801AA01
TEST LINES: SHORT CIRCUIT TERMINATION	F0227	NTX901AA17
TEST LINES: 1000-BALANCE/QUIET	F0218	NTX901AA17

Feature Title	Feat	PEC
TERMINATION		
TEST LINES: 1111-MILLIWATT	F0219	NTX901AA17
TEST LINES: 1120-NONSYNCHRONOUS	F0220	NTX801AA01
(ORIG.)		
TEST LINES: 1120-NONSYNCHRONOUS	F0220	NTX901AA17
(ORIG.)		
TEST LINES: 1181-SYNCHRONOUS (ORIG.)	F0221	NTX801AA01
TEST LINES: 1181-SYNCHRONOUS (ORIG.)	F0221	NTX901AA17
TESTLINES 100 ORIGINATING &	F0026	NTX001AA21
TERMINATING		
TESTLINES 101 ORIGINATING &	F0027	NTX001AA21
TERMINATING		
TESTLINES 102 ORIGINATING &	F0028	NTX001AA21
TERMINATING		
TESTLINES 103 ORIGINATING &	F0029	NTX001AA21
TERMINATING		
TEXT EDITOR FOR SOS	F1885	NTX183AA04
TGB/TAC ACCESS THRU SPECIAL KEY	F1604	NTX100AA20
THEORETICAL OFFICE	F0269	NTX901AA17
THIRD NUMBER	F1109	NTX030CC10
THREE WAY CALLING	F2231	NTX020AC01
THRESHOLDING & EXCEPTION REPORTING (15MIN)	F0072	NTX053AA05
THRESHOLDING ON PERMANENT SIGNAL (LINE CABLE FAILURE)	F0182	NTX901AA17
THROUGH DIALLING	F0381	NTX100AA20
TIME AND CHARGES AUTO PRT. ON T&C TTY	F0964	NTX030CC10
TIME AND CHARGES RECALL TO OPERATOR	F2334	NTX030CC10
TIME AND CHARGES SUBSCRIBER LINE CLASS	F0614	NTX049AE01
TIME OF DAY NCOS	F1767	NTX434AA01
TIME OF DAY ROUTING	F1183	NTX433AA01
TOLL CALL FORWARDING ENHANCEMENTS	F2469	NTX020AC01
TOLL CALLS WITHOUT PREFIX DIGIT 1	F0602	NTX001AA21
TOLL DIVERSION	F0359	NTX901AA17
TOLL DIVERSION ENHANCEMENTS	F2519	NTX901AA17
TOLL FREE CALLS	F1242	NTX030CC10
TOLL NETWORK PROTECTION	F0275	NTX902AA07
TOLL RESTRICTION	F0360	NTX007AB02
TONE DETECTION	F1744	NTX100AA20
TONE GENERATION	F0637	NTX054AA05
TONE IDENTIFICATION OF ONI/ANIF CALLS	F0944	NTX030CC10
TOPS - AMA RECORDS VERIFICATION	F3718	NTX030CC10
TOPS - ANI FORWARDING ON 0-CALLS	F2620	NTX187AA03
TOPS - ANI SIGNALLING COMPATIBILITY	F2621	NTX187AA03
TOPS - CHARGE_A_CALL ENHANCEMENTS	F2527	NTX030CC10
TOPS - CREDIT CARD DIGIT CHECK	F2581	NTX394AA01
TOPS - EXCHANGE ACCESS OPERATOR SERVICES SIGNALLING	F2959	NTX891AA01
TOPS - EXPANDED INBAND COIN CONTROL	F3733	NTX030CC10
TOPS - KEY FUNCTION ENHANCEMENTS	F3716	NTX030CC10
TOPS - LONG DISTANCE DIRECTORY ASSISTANCE	F2622	NTX645AA01
TOPS - OPERATOR FLEXIBLE ROUTING	F2619	NTX187AA03
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Feature Title	Feat	PEC
TOPS ALTERNATE ANNOUNCEMENT	F2917	NTX850AA01
TOPS AMA ON OPERATOR SEQUENCE CALLS	G0056	NTXA28AA02
TOPS BASE MMI CHANGES ENHANCEMENTS	F7095	NTX030CC10
TOPS BASE MMI MODIFICATION	F7151	NTX030CC10
TOPS BILINGUAL MMI FOR DEVICES	F7145	NTX030BA03
TOPS CALL CODE 009 FOR DA	F2920	NTX188AA02
TOPS CLOSEDOWN	F2605	NTXA60AA01
TOPS COIN SUPV. SIG. OPTION	F2856	NTX030CC10
TOPS CROSSBAR SIGNALLING	F2958	NTX030CC10
TOPS FGB CALL CODE 134	G0053	NTX187AA03
TOPS INCOMING FEATURE GROUP D SIGNALLING	G0055	NTXA26AA01
TOPS INTERLATA CARRIER SERVICE	F2855	NTX714AA01
TOPS MP ARU CALL PROCESSING	F6956	NTXA62AA01
TOPS MP DA/INT CALL PROCESSING	F6953	NTXA62AA01
TOPS MP DA/INT QUEUEING	F6683	NTX030CC10
TOPS MP EXPANDED OGT AND XFR KEY CAPABILITY	F6951	NTX030CC10
TOPS MP FORCE MANAGEMENT CONTROLS AND FADS	F6684	NTX030CC10
TOPS MP FORCE MANAGEMENT DATAFILL AND OMS	F6952	NTXA62AA01
TOPS MP INTERFACE TO OPERATOR REFERENCE DATABASES (ORDB)	G0047	NTXA20AA01
TOPS MP INTERNAL/EXTERNAL ARU MESSAGE ROUTING	F6531	NTXA62AA01
TOPS MP KEY FUNCTIONS AND SCREEN UPDATES	F6955	NTX030CC10
TOPS MP STANDARD DA INTERCEPT MESSAGING	F6530	NTXA63AA01
TOPS MP TRUNKING	F6950	NTX030CC10
TOPS OM ENHANCEMENTS - PHASE II	F6166	NTX030CC10
TOPS OPERATIONAL MEASUREMENTS ENHANCEMENTS	F5975	NTX030CC10
TOPS OPERATOR PASSWORD	F7178	NTXE00AA01
TOPS POSITION SIMULATOR	F1725	NTX182AA04
TOPS REALTIME ENHANCEMENTS	F6164	NTX030CC10
TOPS V I/F - INCHARGE ASST. FORCE MGMT. POSITIONS	F5973	NTX724AA02
TOPS V OPERATOR POSITION I/F	F5972	NTX724AA02
TOPS VERIFICATION SCRAMBLING & TONE OPTIONS	F3720	NTX030CC10
TOTAL CALLS SUMMARY ON AMA RECORD	F0586	NTX042AA04
TOTAL CALLS SUMMARY ON AMA RECORD	F0586	NTX044AA04
TPC ADMINISTRATION	F5981	NTXA90AA01
TPC ADMINISTRATION	F5981	NTX731AA03
TPC DA APPLICATION - CCI	F7079	NTXA91AA01
TPC DEBUG TERMINAL HANDLE	F5979	NTXA90AA01
TPC DEBUG TERMINAL HANDLE	F5979	NTX731AA03
TPC DIAGNOSTICS	F5976	NTXA90AA01
TPC DIAGNOSTICS	F5976	NTX731AA03
TPC DRIVERS	F5977	NTXA90AA01
TPC DRIVERS	F5977	NTX731AA03
TPC HSDA DOWNLOADER	F7070	NTXA90AA01
TPC HSDA DRIVER	F7071	NTXA90AA01
TPC HSDA MAINTENANCE SERVER	F7072	NTXA90AA01
TPC HSDA MAN MACHINE INTERFACE	F7073	NTXA90AA01
TPC HSDA ROM	F7069	NTXA90AA01
TPC HSDA SOFTWARE	F7068	NTXA90AA01

Feature Title	Feat	PEC
TPC MESSAGING	F7076	NTXA90AA01
TPC MESSAGING HANDLER	F7077	NTXA90AA01
TPC SERVICE INTERWORKING	F7074	NTXA90AA01
TPC SYSTEM SUPPORT	F5980	NTXA90AA01
TPC SYSTEM SUPPORT	F5980	NTX731AA03
TPC TAMI RESTRUCTURE	F7075	NTXA90AA01
TPC TUTOR I/F	F5978	NTXA90AA01
TPC TUTOR I/F	F5978	NTX731AA03
TPS ROBUSTNESS AND FAULTS	F6968	NTX833AA03
TPS(3.5) WITH TASKED MESSAGE HANDLING	F6610	NTX833AA03
TRAFFIC ANALYSIS	F0315	NTX001AA21
TRAFFIC AND OPERATIONAL MEASUREMENTS (BASIC TOLL)	F0292	NTX801AA01
TRAFFIC SAMPLING	F0554	NTX030BA03
TRANSFER FOR UCD	G0088	NTX101AA13
TRANSLATION AND ROUTING	F5991	NTX710AA02
TRANSLATION IMPLIED BY DIALLING PLAN AND SIGNALING	F0162	NTX001AA21
TRANSLATION OF CIRCUITS TO DIGITS DIALLED	F1682	NTX178AA01
TRANSLATION OF CIRCUITS TO DIGITS DIALLED	F1682	NTX182AA04
TRANSLATION VERIFICATION - TRUNKS	F2223	NTX055AB03
TRANSLATION VERIFICATION ENHANCEMENTS	F1492	NTX055AB03
TRAP AND RESTART COUNTER MANAGEMENT	F5400	NTX001AA21
TRAPINFO ENHANCEMENTS	F7055	NTX001AA21
TREATMENT OMS - SEPARATE CATEGORIES	F2660	NTX001AA21
TRK GRP BUSY OF VIRTUAL FACILITY GRPS ON ATTENDANT CONSOLE	F3789	NTX112AB03
TRK RTS SPEED-UP PHASE I	F5716	NTX001AA21
TROUBLE LOG EXPANSION	F0631	NTX053AA05
TROUBLE REPORT	F1103	NTX030CC10
TRUNK BUSY VERIFY TONE	F5628	NTX100AA20
TRUNK CIRCUIT TYPE IDENTIFICATION	F0141	NTX053AA05
TRUNK CLASS SCREENING	F0305	NTX801AA01
TRUNK GROUP BUSY INDICATION	F1178	NTX100AA20
TRUNK GROUP CONTROL IDENTIFIERS	F6249	NTX455AB01
TRUNK GUARD TIMING	F0058	NTX001AA21
TRUNK I/F TO AE NO. 31 SWITCHBOARD	F1300	NTX001AA21
TRUNK IDENTIFIER IN AMA/SMDR RECORD	F0569	NTX076AA01
TRUNK IDENTIFIER IN AMA/SMDR RECORD	F0569	NTX102AA04
TRUNK IDLE PRIMITIVE FOR DTCEX LINEUP	F6158	NTX001AA21
TRUNK OUT OF SERVICE FOR DATA CHANGE	F2377	NTX001AA21
TRUNK RTS SPEED-UP - PHASE II	F5928	NTX001AA21
TRUNK SIGNAL TIMING CHANGES	F3349	NTX001AA21
TRUNK SIGNALING PROTOCOL/FORMAT CONVERSION	F2635	NTX187AA03
TRUNK SUPERVISION OVER DTC SWACT	F5935	NTX001AA21
TRUNK SUPERVISION OVER DTC SWACT	F6156	NTX001AA21
TRUNK VERIFICATION FROM DESIGNATED STATION	F2727	NTX717AB01
TRUNK VERIFICATION FROM DESIGNATED STATION II	F6275	NTX717AB01
TRUNKS - BATTERY AND GROUND	F0149	NTX001AA21
TRUNKS - DELAY DIAL	F0041	NTX001AA21
TRUNKS - DIAL PULSE (10 PPS)	F1100	NTX001AA21

Feature Title	Feat	PEC
TRUNKS - E&M	F0021	NTX001AA21
TRUNKS - HI-LO	F0024	NTX001AA21
TRUNKS - IMMEDIATE DIAL	F0043	NTX001AA21
TRUNKS - LOOP	F0152	NTX001AA21
TRUNKS - MF (7DPS)	F1101	NTX001AA21
TRUNKS - REMOTE MAKE BUSY	F0063	NTX001AA21
TRUNKS - REVERSE BATTERY	F0022	NTX001AA21
TRUNKS - SF	F0023	NTX001AA21
TRUNKS - STOP-GO	F0044	NTX001AA21
TRUNKS - WINK START	F0047	NTX001AA21
TSMS PDAB/PDTO PEG COUNT	F2484	NTX085AA05
TSMS PDAB/PDTO USAGE	F2485	NTX087AA04
TSMS PEG COUNT ON IBN	F2464	NTX085AA05
TSMS PEG COUNT SOURCE AND DISPOSITION UP TO 128	F1219	NTX085AA05
TSMS PEG COUNT SOURCE AND DISPOSITION UP TO 16	F1218	NTX001AA21
TSMS REPORT SUMMARIZED	F1221	NTX088AA04
TSMS REPORT SUMMARIZED FOR PDAB/PDTO	F2486	NTX088AA04
TSMS REPORT SUMMARIZED ON IBN	F2466	NTX088AA04
TSMS USAGE ON IBN	F2465	NTX087AA04
TSMS USAGE SOURCE AND DISPOSITION UP TO 128	F1220	NTX087AA04
TTP DETACHED USER	F7207	NTX055AA03
TTP SUPPORT FOR 3X09MTA	F3436	NTX901AA17
TTP- CALL TRANSFER (LOCAL)	F0642	NTX055AA03
TTP- SCHEDULED STATUS REPORT	F0643	NTX055AA03
TTP- TRUNK STATUS QUERY	F0644	NTX055AA03
TTP- 101XX CALL ROUTING	F0645	NTX055AA03
TWO WAY OPERATOR OFFICE TRUNK (TWOOT)	F2224	NTX030CC10
TWO WAY OPERATOR OFFICE TRUNKS(BELL AND AMR-5)	F2344	NTX902AA07
TWO WAY OPERATOR OFFICE TRUNKS(BELL)	F1190	NTX902AA07
TWO WAY OPERATOR OFFICE TRUNKS(TWOOT)	F2207	NTX129AA02
TWO WAY WATS LINES	F2411	NTX006AA04
TWO-WAY SPLITTING	F0382	NTX100AA20
TWX	F0345	NTX006AA04
TYPE B LINE CARD MAINTENANCE	F3821	NTX901AA17
TYPE 2A CELLULAR INTERCONNECTION	F2916	NTX843AA01
T1 MTCE FOR REMOTE LINKS	F3498	NTX213AB02
T1 SYSTEM MTCE WHEN DIRECTLY CONNECTED	F0144	NTX001AA21
UCD ON EBS SET AND UCD SD POINT	F2989	NTXA77AA01
UNAUTHORIZED DIGITONE SERVICE DETECTION	F2482	NTX206AA01
UNAUTHORIZED/CODE BLOCKING	F0306	NTX801AA01
UNIFORM CALL DISTRIBUTION	F1272	NTX101AA13
UNIFORM CALL DISTRIBUTION FROM QUEUE	F0383	NTX100AA20
UNIFORM NUMBERING PLAN CAPABILITY	F0761	NTX100AA20
UP TO 7 ALTERNATE ROUTES	F0163	NTX001AA21
UPHEAD OF CUSTOMER LINE DATA TO DNC	F6234	NTX563AA03
UTILITIES FOR 3X09MTA	F3435	NTX901AA17
UTR - CALL PROCESSING FOR LINES	F5446	NTX269AA07
UTR - CALL PROCESSING FOR TRUNKS	F5537	NTX269AA07
UTR BASE ENHANCEMENTS	F6284	NTX269AA07

Feature Title	Feat	PEC
V AND H LATA RATE ENHANCEMENT	F2627	NTX030CC10
V-H CO-ORDINATES CHARGE CALCULATION	F0984	NTX030CC10
VARIABLE INITIAL PERIOD	F1112	NTX030CC10
VARIABLE INITIAL RATE (VIR) IDENT. (COIN BOX FEATURE)	F0197	NTX901AA17
VARIABLE INTER-DIGITAL TIMING	F0045	NTX001AA21
VARIABLE LANGUAGE BMMI	F4495	NTX066AA02
VARIABLE LENGTH/SAME LEADING DIGIT(S) TRANSLATION	F2740	NTX100AA20
VARIABLE LOCAL COIN CHARGE	F2337	NTX030CC10
VARIABLE QUANTITIES OF T1 LINE	F0719	NTX023AB03
VARIABLE SPEED CALL ACCESS CODE	F2739	NTX898AA01
VARIABLE TIMING - DP TRUNK RECEPTION AND OUTPULSING	F3483	NTX001AA21
VCD QUEUE STATUS LAMPS ATTENDANT FEATURES	F6211	NTX101AA13
VDU & PRINTER LINK TERMINAL CAPABILITY	F2120	NTX001AA21
VERIFICATION	F0967	NTX030CC10
VERIFICATION SWITCHING	F0294	NTX801AA01
VFG INWATS OVFL TOTALS TO AMA TAPE - IBN	G0003	NTX112AB03
VFG USAGE DATA	F3841	NTX112AB03
VMX INTERFACE	F3800	NTX411AA01
VOICE NUMBER VERIFICATION	F0183	NTX901AA17
VOICE QUOTE OF CHARGES ON A CENTRAL TTY	F0968	NTX030CC10
WARM LINE	F2400	NTX127AA01
WILDCARD KEY	F1605	NTX100AA20
X.25 PACKAGING ENHANCEMENTS FOR NOP	F6319	NTX560AB02
XFER SIMULTANEOUS POLLING	F5745	NTX059AB04
XPM BOOTSTRAP IMC/IPML MESSAGING ENHANCEMENT FOR NT6X69	F7133	NTX270AA12
XPM DIAG DRIVER ENHANCEMENTS	F5904	NTX270AA12
XPM DTMF FOR TRUNKS WITH UTR	F5727	NTX269AA07
XPM IMC DIAGNOSTICS	F7126	NTXA67AA01
XPM IPML DATA DISTRIBUTION	F6984	NTXA66AA01
XPM IPML MESSAGING FOR OFFICE RECOVERY	F7132	NTX270AA12
XPM ISDN CALL CAPACITY EXPANSION	F6904	NTX750AB04
XPM MATE DIAGNOSTIC	F7131	NTXA67AA01
XPM PERFORM TOOL ROBUSTNESS	F6444	NTX827AA02
XPM PERIPHERAL BIT ERROR TESTING	F6357	NTX885AA02
XPM PERIPHERAL BIT ERROR TESTING	F6357	NTX885AB01
XPM PSIDE DATA DISTRIBUTION	F6985	NTXA66AA01
XPM REALTIME AND PERFORMANCE TOOLS	F6168	NTX827AA02
XPM REALTIME ENHANCEMENTS	F5734	NTX270AA12
XPM ROM DIAGNOSTIC IMPROVEMENTS	F7125	NTX270AA12
XPM ROM DIAGNOSTIC MMI	F5833	NTX270AA12
XPM ROUTINE EXERCISE TEST	F5813	NTX270AA12
XPM RTS ENHANCEMENTS	F6403	NTX270AA12
XPM SYNC DIAGNOSTIC	F6601	NTX270AA12
XPM TASK LEVEL UART IMC MESSAGING ENHANCEMENT	F7134	NTXA67AA01
XPM WARM SWACT	F6558	NTX790AA03
XPM 6X45BA MAINTENANCE ENHANCEMENTS	F7124	NTXA67AA01
0 AND N11 CALL TREATMENT	F0198	NTX901AA17
0+ DA AND 0+ 800 PERMISSIVE DIALING	F2751	NTX901AA17
010 SERVICE CODE	F2497	NTX901AA17

Feature Title	Feat	PEC
1 OR 2 WAY DID/DOD VIA DCM	F2459	NTX094AA01
1 OR 2 WAY INWATS/OUTWATS VIA DCM	F2483	NTX094AA01
1+ PERMISSIVE AND NON-PERMISSIVE DIALLING IN THE SAME OFFICE	F2449	NTX001AA21
1A/1B EADAS - BX.25 INTERFACE	F2555	NTX218AA03
1A/1B EADAS/NM - BX.25 INTERFACE	F2691	NTX455AA01
1A/1B EADAS/NM - BX.25 INTERFACE	F2691	NTX455AB01
10-PARTY FLAT RATE	F0252	NTX901AA17
102 TEST LINE TERMINATION (-10/-15DB)	F3344	NTX001AA21
104 ORIGINATING AND TERMINATING TEST LINE	F0277	NTX802AA04
104 ORIGINATING AND TERMINATING TEST LINE	F0277	NTX902AA07
105 TERMINATING TEST LINE	F0331	NTX802AA04
105 TERMINATING TEST LINE	F0331	NTX902AA07
105 TESTLINE ERL/SRL	F5409	NTX136AA03
108 TEST LINE (ECHO SUPPRESSION LOOP-AROUND)	F0685	NTX063AA02
1200 BAUD DIAL-UP AUTOQUOTE	F5743	NTX140AA02
1200 BAUD DIAL-UP DATA PORT	F0114	NTX001AA21
14 INCH WINCHESTER DISK DRIVE	F2279	NTX074AA06
15 MINUTE REPORTS FOR MFADS	F2812	NTX030BA03
150 MB DISK SUPPORT	F3320	NTX074AA06
2.75 MW PROGRAM STORE	F3862	NTX000AA13
2-PARTY FLAT RATE	F0253	NTX901AA17
2-STAGE OUTPULSING TO GATEWAY (U.S)	F1034	NTX072AA01
24 MB MEMORY PHASE II	F7103	NTX941AA05
24MB MEMORY	F6669	NTX940AA06
3-WAY CALL CHAINING	F2800	NTX808AA01
3-WAY CALL CHAINING	F2800	NTX820AA01
3-WAY CONFERENCE/TRANSFER	F0414	NTX100AA20
3WC TO CHAINING TO ACD INTERACTION	F6492	NTX407AB01
3WC/CALL TRANSFER TO ACD	F5957	NTX407AB01
30 SECOND DISCRETS ENHANCEMENT	F6028	NTX455AB01
300 BAUD DIAL-UP AUTOQUOTE	F2428	NTX140AA02
380 MBYTE DISK FOR DPP	G0099	NTX243AA07
4 - SECOND TIMEOUT ON 0+ CALLS	F0943	NTX030CC10
4-PARTY SELECTIVE FLAT RATE	F0254	NTX901AA17
4/5/6-DIGIT LOCAL DIALLING	F0229	NTX902AA07
6 DIGIT OUTWATS BAND SCREENING	F2438	NTX006AA04
6 MEG MEMORY	F6617	NTX941AA05
6 PORT CONFERENCE CIRCUIT USE CONTROL	F1475	NTX100AA20
6M MEMORY MAINTENANCE	F6240	NTX941AA05
6X17AA LINE CARD FACILITY MAINTENANCE	F3352	NTX901AA17
6X17AD LINE CARD MTCE SUPPORT	F6449	NTX901AA17
8-PARTY SEMISELECT FLAT RATE	F0255	NTX901AA17
844 SERVICE CODE FOR TIME AND TEMPERATURE	F0850	NTX049AL01
9X74 FIRMWARE	F6644	NTX833AA03
911 CALL HOLD AND RINGBACK WITH ANI OUTPULSING	F0751	NTX019AA01
911 SERVICE (TRUNK)	F0447	NTX019AA01
958 990 660 SERVICE CODES - N.Y. TEL	F2442	NTX901AA17

Feature Number	Feature Package	Feature Title
F0007	NTX053AA05	CIRCUIT LOCATE LINE
F0008	NTX053AA05	CIRCUIT LOCATE TRUNKS
F0010	NTX001AA21	INPUT COMMAND SCREENING I/O PORT RESTRICTIONS
F0011	NTX001AA21	BASIC DATA MODIFICATION SYSTEMDATA VALIDITY CHECKS
F0013	NTX001AA21	INTERFACE TO S-C TURRET - VISUAL INDICATORS
F0015	NTX001AA21	INTERFACE TO S-C SCAMA OPER POSN-ONI/ANIF
F0016	NTX001AA21	ANALOG SWITCHBOARD TRUNKS
F0018	NTX901AA17	RINGBACK
F0019	NTX901AA17	FREQUENCY SELECTIVE DECIMONIC
F0020	NTX901AA17	BRIDGED RINGING
F0021	NTX001AA21	TRUNKS - E&M
F0022	NTX001AA21	TRUNKS - REVERSE BATTERY
F0023	NTX001AA21	TRUNKS - SF
F0024	NTX001AA21	TRUNKS - HI-LO
F0025	NTX901AA17	OPERATIONAL MEASUREMENT (BASIC LOCAL)
F0026	NTX001AA21	TESTLINES 100 ORIGINATING & TERMINATING
F0027	NTX001AA21	TESTLINES 101 ORIGINATING & TERMINATING
F0028	NTX001AA21	TESTLINES 102 ORIGINATING & TERMINATING
F0029	NTX001AA21	TESTLINES 103 ORIGINATING & TERMINATING
F0030	NTX019AA01	ALTERNATE ROUTING
F0031	NTX019AA01	SELECTIVE ROUTING
F0033	NTX001AA21	INTERFACE TO MODIFIED N.E. TSD FOR ONI
F0034	NTX001AA21	INTERFACE TO STROMBERG-CARLSON TURRET - ONI
F0035	NTX901AA17	GROUNDING RINGING
F0036	NTX901AA17	EXTENDED AREA SERVICE
F0039	NTX001AA21	OUTGOING TRUNK IDLE SELECTION
F0040	NTX001AA21	OUTPUT ROUTING AND REPORTING
F0041	NTX001AA21	TRUNKS - DELAY DIAL
F0042	NTX001AA21	INTEGRITY CHECKING, CONTINUITY & FACILITY CHECKS ON TRUNKS
F0043	NTX001AA21	TRUNKS - IMMEDIATE DIAL
F0044	NTX001AA21	TRUNKS - STOP-GO
F0045	NTX001AA21	VARIABLE INTER-DIGITAL TIMING
F0047	NTX001AA21	TRUNKS - WINK START
F0052	NTX001AA21	DIGITAL DS-1 BIT RATE
F0054	NTX901AA17	INTERFACE WITH #3 LTC
F0055	NTX001AA21	DETECTION OF ANSWER SUPERVISION
F0056	NTX001AA21	DETECTION OF DISCONNECT
F0057	NTX001AA21	GLARE RESOLUTION
F0058	NTX001AA21	TRUNK GUARD TIMING
F0059	NTX001AA21	DETECTION OF HIT
F0061	NTX001AA21	RING BACK
F0062	NTX001AA21	RING FORWARD

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Feature Number	Feature Package	Feature Title
F0063	NTX001AA21	TRUNKS - REMOTE MAKE BUSY
F0065	NTX001AA21	ALARMS THRESHOLDING OF CRITICAL RESOURCES(MFR,DTR)
F0066	NTX001AA21	ANALOG TOLL CONNECTING
F0068	NTX001AA21	INCOMING TEST TRUNK FROM AECO LOCAL TEST DESK
F0070	NTX001AA21	PER CALL TRUNK TESTING
F0072	NTX053AA05	THRESHOLDING & EXCEPTION REPORTING (15MIN)
F0077	NTX001AA21	BASIC DATA MODIFICATION SYSTEMCOMMAND EDITING
F0078	NTX001AA21	BASIC DMO SYSTEM(ADD,DEL,MOD) FEATURES
F0079	NTX001AA21	BASIC DMO SYSTEM(ADD,DEL,MOD) LINE EQUIPMENT NO. (LEN)
F0080	NTX001AA21	BASIC DATA MODIFICATION SYSTEMPROMPTED & UNPROMPTED INPUT
F0081	NTX001AA21	BASIC DMO SYSTEM(ADD,DEL,MOD) SERVICES
F0082	NTX001AA21	BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRANSLATION
F0083	NTX001AA21	BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRUNK GROUPS
F0084	NTX001AA21	BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRUNKS
F0090	NTX082AA01	SUBSCRIBER LINE USAGE REGISTERS
F0092	NTX001AA21	REMOTED ADMINISTRATION
F0093	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-SELECTIVE PRINTOUT
F0094	NTX001AA21	INTERCEPTED CALL ROUTED TO ANNOUNCEMENT
F0095	NTX001AA21	INTERCEPTED CALL ROUTED TO OPERATOR
F0096	NTX001AA21	INTERCEPTED CALL ROUTED TO TONE
F0097	NTX001AA21	MACHINE ANNOUNCEMENTS ANALOG
F0098	NTX001AA21	ORIGINATING AND TERMINATING SERVICE
F0099	NTX001AA21	DDD ACCESS (+1)
F0100	NTX001AA21	SERVICE CODE N11
F0101	NTX001AA21	LOCAL DIALING
F0102	NTX001AA21	NORTH AMERICAN CODE FORMAT
F0103	NTX001AA21	OPERATOR 0-
F0104	NTX001AA21	RECEIVE/OUTPULSE UP TO 15 DIGITS
F0108	NTX001AA21	INTERFACE TO 3CL SWITCHBOARD
F0109	NTX001AA21	INTERFACE TO CAMA SWITCHBOARDS
F0110	NTX001AA21	ALARMS VISUAL ON FRAMES/AISLES
F0111	NTX901AA17	ROH TONES
F0112	NTX001AA21	MAGNETIC TAPE HANDLER 1600 BPI
F0113	NTX901AA17	HOTEL/MOTEL MANUAL PBX SERVICE
F0114	NTX001AA21	1200 BAUD DIAL-UP DATA PORT
F0115	NTX001AA21	ALARMS AUDIBLE/VISUAL
F0116	NTX001AA21	ALARMS DEAD OFFICE ALARM
F0117	NTX001AA21	ALARMS MAJOR MINOR CRITICAL
F0118	NTX001AA21	AUTO BUSY OUT OF FAULTY SUB-UNIT
F0119	NTX001AA21	BUSY OUT/IDLE EQUIPMENT
F0120	NTX053AA05	CALL TRACING (OFFICE PATH TRACE)
F0121	NTX001AA21	INTEGRATED CO COMMUNICATIONS
F0123	NTX001AA21	BASIC DMO SYSTEM(ADD,DEL,MOD) DIRECTORY NUMBERS (DN)
F0126	NTX001AA21	LINE/TRUNK STATUS QUERY OR DUMP
F0128	NTX001AA21	MAINTENANCE POSITION DIAL-UP ACCESS
F0129	NTX001AA21	MAINTENANCE POSITION LOCAL
F0130	NTX001AA21	MAINTENANCE POSITION REMOTE
F0131	NTX001AA21	MANUAL CONTROL OF SYSTEM CONFIGURATION

Feature Number	Feature Package	Feature Title
F0132	NTX001AA21	MANUAL LINE OR TRUNK ACCESS TESTING
F0135	NTX001AA21	ROUTINE TESTING
F0136	NTX001AA21	SEMI-AUTOMATIC TRUNK TESTING
F0137	NTX055AA03	STUCK SENDER FEATURE ON OUTGOING TRUNKS
F0138	NTX001AA21	SYSTEM STATUS DISPLAY
F0139	NTX001AA21	ALARMS REMOTING
F0140	NTX001AA21	AUTOMATIC TROUBLE DIAGNOSTIC AND STANDBY SWITCHING
F0141	NTX053AA05	TRUNK CIRCUIT TYPE IDENTIFICATION
F0143	NTX901AA17	INTERFACE WITH PORTA SYSTEM LINE TEST UNIT
F0144	NTX001AA21	T1 SYSTEM MTCE WHEN DIRECTLY CONNECTED
F0145	NTX901AA17	CLASS OF SERVICE TONES
F0148	NTX001AA21	ALARMS EXTERNAL ALARM DETECTION
F0149	NTX001AA21	TRUNKS - BATTERY AND GROUND
F0152	NTX001AA21	TRUNKS - LOOP
F0154	NTX001AA21	DELETE/PREFIX UP TO 15/11 DIGITS RESPECTIVELY
F0155	NTX001AA21	FOREIGN AREA TRANSLATION
F0156	NTX001AA21	INTERCHANGEABLE AREA/OFFICE CODES-E DIGIT UNBLOCKING
F0157	NTX001AA21	OPERATOR/TOLL CALLS (1N1/11XX)
F0159	NTX001AA21	LINE/TRUNK TYPE QUERY
F0162	NTX001AA21	TRANSLATION IMPLIED BY DIALLING PLAN AND SIGNALLNG
F0163	NTX001AA21	UP TO 7 ALTERNATE ROUTES
F0164	NTX901AA17	INTERFACE WITH AE #21 LTD
F0165	NTX901AA17	BRIDGED AND GROUNDED RINGERS ON SAME LINE
F0166	NTX902AA07	SERVICE CODES 11X 410X
F0167	NTX901AA17	COIN STUCK & COIN PRESENT/ABSENT DETECTION
F0168	NTX901AA17	DIAL TONE SPEED MEASUREMENT
F0169	NTX901AA17	ONI 4-PARTY
F0171	NTX901AA17	FOREIGN EXCHANGE LINES ANALOG
F0173	NTX901AA17	INTERFACE WITH #14 LTD - VIA SARTS
F0174	NTX901AA17	INTERFACE WITH AE #1 LTD
F0175	NTX901AA17	INTERFACE WITH PULSAR II IMTS
F0176	NTX901AA17	LINE DATA BASE QUERIES
F0178	NTX902AA07	DDD THROUGH TOPS COIN
F0181	NTX901AA17	INFORMATION AND REPAIR ROUTED TO KEY SYSTEM
F0182	NTX901AA17	THRESHOLDING ON PERMANENT SIGNAL (LINE CABLE FAILURE)
F0183	NTX901AA17	VOICE NUMBER VERIFICATION
F0184	NTX044AA04	BLUE BOX FRAUD PREVENTIONN
F0185	NTX901AA17	PURPLE BOX WIRE TAP
F0186	NTX901AA17	RECEIVER OFF-HOOK TREATMENT
F0187	NTX901AA17	HUNTING DIRECTORY NUMBERS
F0188	NTX901AA17	COIN CONTROL + OR - 130V TO COIN STATION
F0189	NTX901AA17	COIN CONTROL INBAND SIGNALLING (AC)
F0190	NTX901AA17	COIN CONTROL MULTIWINK
F0191	NTX901AA17	PREPAY COIN FIRST
F0192	NTX901AA17	PREPAY DIALTONE FIRST
F0193	NTX901AA17	COIN CONTROL THIRD WIRE
F0194	NTX901AA17	COIN CONTROL TIP AND RING
F0196	NTX901AA17	SEMI-POST PAY

Feature Number	Feature Package	Feature Title
F0197	NTX901AA17	VARIABLE INITIAL RATE (VIR) IDENT. (COIN BOX FEATURE)
F0198	NTX901AA17	0 AND N11 CALL TREATMENT
F0199	NTX901AA17	DENIED ORIGINATING
F0200	NTX901AA17	DENIED SERVICE
F0201	NTX901AA17	DENIED TERMINATING
F0202	NTX901AA17	OFFICE DEPENDANT CALL DISCONNECT TREATMENT
F0203	NTX901AA17	FREE NUMBER TERMINATING
F0204	NTX901AA17	REVERTIVE CALLS 7 DIGIT DIALLED (2-PARTY)
F0205	NTX901AA17	REVERTIVE CALLS 7 DIGITS DIALLED (MULTI-PARTY)
F0206	NTX901AA17	INTERFACE WITH #14 LTD - DIRECT
F0208	NTX901AA17	INTERFACE WITH BADGER 612A
F0209	NTX901AA17	INTERFACE WITH DACS
F0210	NTX901AA17	INTERFACE WITH STROMBERG-CARLSON #14 LTD
F0213	NTX901AA17	DIGITONE STATION TESTING
F0215	NTX901AA17	INTERFACE WITH LORDEL MITS70 LINE TEST SYSTEM
F0216	NTX901AA17	LINE INSULATION TESTING
F0217	NTX901AA17	LOOP INTEGRITY CHECKS ON LINES
F0218	NTX901AA17	TEST LINES: 1000-BALANCE/QUIET TERMINATION
F0219	NTX901AA17	TEST LINES: 1111-MILLIWATT
F0220	NTX801AA01	TEST LINES: 1120-NONSYNCHRONOUS (ORIG.)
F0221	NTX901AA17	
F0221	NTX801AA01	TEST LINES: 1181-SYNCHRONOUS (ORIG.)
F0223	NTX901AA17	
F0223	NTX801AA01	TEST LINES: OPEN CIRCUIT TERMINATION
F0224	NTX901AA17	
F0224	NTX901AA17	PER CALL LINE TESTING
F0225	NTX901AA17	PERMANENT SIGNAL/PARTIAL DIAL LOCKOUT AND AUTOMATIC-CLEARING
F0226	NTX901AA17	PLUG-UP FACILITY INTERCEPT
F0227	NTX801AA01	TEST LINES: SHORT CIRCUIT TERMINATION
F0228	NTX901AA17	
F0228	NTX901AA17	STATION RINGER TEST
F0229	NTX902AA07	4/5/6-DIGIT LOCAL DIALLING
F0230	NTX044AA04	ONI SWITCHING ON ANI FAIL
F0231	NTX901AA17	DIRECTORY ASSISTANCE CHARGING(411 RECORDING ON MAG TAPE
F0232	NTX901AA17	INDIVIDUAL
F0233	NTX901AA17	ONI/ANI
F0234	NTX901AA17	OPERATOR VERIFICATION
F0236	NTX901AA17	ONI/ANI 2-PARTY
F0238	NTX055AA03	MONITIOR TALK
F0239	NTX901AA17	LINES DIAL PULSE (10 PPS)
F0240	NTX901AA17	LINES DIGITONE
F0241	NTX901AA17	LINES FLASHING
F0242	NTX901AA17	LINES GROUND START
F0243	NTX901AA17	INDIVIDUAL FLAT RATE
F0244	NTX901AA17	INDIVIDUAL MESSAGE RATE

Feature Number	Feature Package	Feature Title
F0245	NTX901AA17	LINES LOOP START
F0246	NTX901AA17	MANUAL LINE(MAN ORIG/DIAL TERM)
F0247	NTX901AA17	OFF PREMISES EXTENSIONS
F0249	NTX901AA17	PBX FLAT RATE GROUND START
F0250	NTX901AA17	PBX FLAT RATE LOOP START
F0252	NTX901AA17	10-PARTY FLAT RATE
F0253	NTX901AA17	2-PARTY FLAT RATE
F0254	NTX901AA17	4-PARTY SELECTIVE FLAT RATE
F0255	NTX901AA17	8-PARTY SEMISELECT FLAT RATE
F0256	NTX901AA17	AC/DC
F0257	NTX901AA17	CODE RING (5 CODES)
F0258	NTX901AA17	FREQUENCY RINGING - HARMONIC
F0259	NTX901AA17	FREQUENCY RINGING - SYNCHROMONIC - 20HZ BARE
F0260	NTX901AA17	REVERTIVE RINGING MULTI-PARTY
F0261	NTX901AA17	REVERTIVE RINGING 2-PARTY
F0263	NTX901AA17	SUPERIMPOSED 4-PARTY FULLY SELECTIVE
F0265	NTX901AA17	LOCAL END OFFICE ROUTING & SCREENING
F0266	NTX901AA17	MULTI-RATE CENTRE
F0267	NTX901AA17	OFFICE CODE SHARING- THOUSANDS DIGITS TRANSLATION
F0268	NTX902AA07	OVERLAP OUTPUTSING LINE TO TRUNK
F0269	NTX901AA17	THEORETICAL OFFICE
F0270	NTX802AA04	MAG TAPE UNIT FOR OM
	NTX902AA07	
F0271	NTX902AA07	MASS CALLING
F0272	NTX802AA04	NAILED UP CONNECTIONS
	NTX902AA07	
F0273	NTX902AA07	SLEEVE LEADS FOR PUBLIC FIRE REPORTING SYSTEM
F0275	NTX902AA07	TOLL NETWORK PROTECTION
F0276	NTX902AA07	O + SERVICE TO TOPS
F0277	NTX802AA04	104 ORIGINATING AND TERMINATING TEST LINE
	NTX902AA07	
F0278	NTX902AA07	CALL HOLD ON MALICIOUS CALL TRACE - POTS LINES
F0279	NTX902AA07	CLI - LINE TERMINATION
F0280	NTX902AA07	LINE LOAD CONTROL
F0282	NTX902AA07	ROUTE TRANSFER
F0283	NTX902AA07	INTERFACE WITH TOPS
F0284	NTX902AA07	INTERFACE WITH TSPS
F0285	NTX902AA07	DDD THROUGH TOPS ONI 1,2 PARTY
F0287	NTX902AA07	CALLS ROUTED TO RECORDING THEN OPERATOR
F0288	NTX902AA07	LOCAL TANDEM
F0289	NTX802AA04	TANDEM SWITCHING- NO DIGITS INCOMING (2WAY TRUNKS)
	NTX902AA07	
F0290	NTX802AA04	TANDEM SWITCHING-NO DIGITS INCOMING (1-WAY TRUNKS)
	NTX902AA07	
F0291	NTX801AA01	LOCAL CALL INTERCEPT
F0292	NTX801AA01	TRAFFIC AND OPERATIONAL MEASUREMENTS (BASIC TOLL)
F0294	NTX801AA01	VERIFICATION SWITCHING
F0295	NTX801AA01	DIRECTORY ASSISTANCE CHARGING (411 CALLS TO AMA)

Feature Number	Feature Package	Feature Title
F0298	NTX801AA01	SWITCHED MF/DP PULSE CONVERSION
F0299	NTX801AA01	SPECIAL BILLING CODES
F0302	NTX801AA01	HOME/FOREIGN AREA TRANSLATION AND SCREENING
F0303	NTX801AA01	OFFICE CODE SHARING THOUSAND DIGIT TRANSLATION
F0304	NTX801AA01	ROUTING ACROSS NPA BOUNDARIES
F0305	NTX801AA01	TRUNK CLASS SCREENING
F0306	NTX801AA01	UNAUTHORIZED/CODE BLOCKING
F0307	NTX801AA01	SWITCHED ACCESS FROM OPERATOR (NON-COIN)
F0308	NTX801AA01	SWITCHED ACCESS TO OPERATOR (NON-COIN)
F0312	NTX060AB10	NM STATUS/CONTROL I/O
F0313	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-RCVR ATT-MENT DELAY REPORTS
F0314	NTX044AA04	ROUTE TRANSFER RONI/CAMA POSITIONS
F0315	NTX001AA21	TRAFFIC ANALYSIS
F0317	NTX060AB10	CODE CONTROLS CODE POINT BLOCKING 3-10 DIGIT
F0318	NTX060AB10	DIRECTIONAL RESERVATION EQUIPMENT (DRE)
F0319	NTX060BA02	DYNAMIC OVERLOAD CONTROL (DOC)
	NTX060BB01	
F0320	NTX060AB10	I/C TRUNK LOAD CONTROL
F0321	NTX060AB10	POSITION AND DISPLAY
F0322	NTX060AB10	O/G TRUNK GROUP CONTROL
F0323	NTX060AB10	ROUTE CONTROLS KEY REROUTE
F0325	NTX060AB10	PROTECTIVE RESERVATION EQPT (PRE)
F0326	NTX060AB10	ROUTE CONTROLS CANCEL FROM
F0331	NTX802AA04	105 TERMINATING TEST LINE
	NTX902AA07	
F0332	NTX802AA04	COMBINED VERIFICATION AND TOLL COMPLETING
	NTX902AA07	
F0334	NTX802AA04	INWATS/OUTWATS
F0338	NTX006AA04	PEG COUNT ON INWATS LINES
F0339	NTX006AA04	INWATS FLAT RATE
F0341	NTX006AA04	INWATS ON TIMING REGISTERS
F0342	NTX006AA04	OUTWATS CANADA
F0343	NTX006AA04	OUTWATS U.S.A.
F0344	NTX006AA04	AUTOMATIC LINE (DATA LINE/HOT LINE)
F0345	NTX006AA04	TWX
F0346	NTX007AB02	FLASH IGNORE (PBX - 2 SEC DISC TIMING)
F0347	NTX007AB02	HUNTING OPTIONS BRIDGED NIGHT NUMBER
F0349	NTX007AB02	HOTEL/MOTEL REGISTRATION REV BAT,3RD WIRE
F0350	NTX007AB02	HUNTING DIRECTORY NUMBER CIRCULAR
F0351	NTX007AB02	HUNTING DISTRIBUTED LINE
F0352	NTX007AB02	HUNTING MULTILINE
F0353	NTX007AB02	OVERFLOW TO: DIRECTORY NUMBER
F0354	NTX007AB02	OVERFLOW REGISTRATION
F0355	NTX007AB02	OVERFLOW TO: ROUTE
F0356	NTX007AB02	HUNTING OPTIONS RANDOM MAKE BUSY
F0357	NTX007AB02	REMOTE SUBSCRIBER LINE OVERFLOW REGISTRATION

Feature Number	Feature Package	Feature Title
F0358	NTX007AB02	HUNTING OPTIONS STOP HUNT
F0359	NTX901AA17	TOLL DIVERSION
F0360	NTX007AB02	TOLL RESTRICTION
F0363	NTX008AB02	DID/DOD OVER 2-WAY PBX LOOP TRUNK
F0364	NTX008AB02	DIRECT INWARD DIALLING (DID) OVER 1-WAY TRUNK TO PBX
F0365	NTX100AA20	ATTENDANT CALL SELECTION
F0366	NTX100AA20	ATTENDANT CAMP-ON
F0367	NTX100AA20	ATTENDANT CONFERENCE (MAXIMUM SIX CONFEREES)
F0368	NTX100AA20	ATTENDANT CONTROL OF TRUNK GROUP ACCESS
F0369	NTX100AA20	ATTENDANT LOCKED LOOP OPERATION
F0370	NTX100AA20	ATTENDANT SPEED CALLING
F0371	NTX100AA20	AUTOMATIC RECALL
F0374	NTX100AA20	CALL HOLD
F0375	NTX100AA20	INTERPOSITION CALLS AND TRANSFERS
F0376	NTX100AA20	LOCKOUT
F0377	NTX100AA20	MULTIPLE CONSOLE OPERATION
F0378	NTX100AA20	MULTIPLE LISTED DIRECTORY NUMBERS
F0379	NTX100AA20	STRAIGHTFORWARD OUTWARD COMPLETION
F0380	NTX100AA20	SWITCHED LOOP OPERATION
F0381	NTX100AA20	THROUGH DIALLING
F0382	NTX100AA20	TWO-WAY SPLITTING
F0383	NTX100AA20	UNIFORM CALL DISTRIBUTION FROM QUEUE
F0384	NTX100AA20	ATTENDANT SERVICE LOCAL CONSOLE
F0385	NTX100AA20	ATTENDANT SERVICE REMOTE CONSOLE
F0387	NTX100AA20	ATTENDANT SERVICE (CENTRALIZED, CITY WIDE)
F0388	NTX100AA20	CLASS OF SERVICE RESTRICTIONS FULLY RESTRICTED SERVICE
F0389	NTX100AA20	CLASS OF SERVICE RESTRICTIONS SEMI-RESTRICTED SERVICE
F0390	NTX100AA20	CLASS OF SERVICE RESTRICTIONS UNRESTRICTED SERVICE
F0391	NTX100AA20	CODE CALL ACCESS
F0393	NTX100AA20	DATA CALL PROTECTION
F0394	NTX100AA20	DICTIONATION ACCESS AND CONTROL (DTMF ONLY)
F0395	NTX100AA20	DIRECT INWARD DIALLING (DID)
F0396	NTX100AA20	DIRECT OUTWARD DIALLING (DOD)
F0397	NTX100AA20	FLEXIBLE INTERCEPT
F0403	NTX100AA20	NIGHT SERVICE TRUNK ANSWER FROM ANY STATION
F0405	NTX100AA20	OFF PREMISES STATIONS AND EXTENSIONS
F0406	NTX100AA20	INDIVIDUAL LINE BUSINESS SERVICE - PBX APPLICATION
F0407	NTX100AA20	STATION TO STATION CALLING
F0408	NTX100AA20	TANDEM SWITCHING OF SPECIAL SERVICE CIRCUITS
F0409	NTX100AA20	LOUD SPEAKER & RADIO PAGING ACCESS
F0410	NTX100AA20	CALL FORWARD ALL CALLS
F0411	NTX100AA20	CALL FORWARD BUSY
F0412	NTX100AA20	CALL FORWARD NO ANSWER
F0413	NTX100AA20	CALL PICKUP
F0414	NTX100AA20	3-WAY CONFERENCE/TRANSFER
F0416	NTX100AA20	SPEED CALLING INDIVIDUAL-SHORT LIST
F0417	NTX100AA20	SPEED CALLING INDIVIDUAL-LONG LIST

Feature Number	Feature Package	Feature Title
F0419	NTX100AA20	SPEED CALLING GROUP-LONG LIST
F0423	NTX103AA09	ACCOUNT CODE/ACCEPTANCE AND RECORDING
F0424	NTX103AA09	ATTENDANT CALL DETAIL ENTRY
F0425	NTX102AA04	STATION MESSAGE DETAIL RECORDING
F0438	NTX100AA20	ATTENDANT CONSOLE DISPLAY
F0446	NTX019AA01	RING DOWN TRUNK FOR 911 SERVICE
F0447	NTX019AA01	911 SERVICE(TRUNK)
F0451	NTX100AA20	CALL WAITING
F0475	NTX024AA01	RLM-INTRA CALLING FOR POTS CALLS
F0477	NTX025AA02	EMERGENCY OPERATION
F0536	NTX030CC10	DIRECT DIAL OVERSEAS (DDO)
F0537	NTX030CC10	OVERSEAS RATING
F0538	NTX030CC10	INTERPOSITION TRANSFER
F0539	NTX030CC10	MOBILE HANDLING ITMS ROAMER
F0542	NTX030BA03	REMOTE TOPS MAINTENANCE
F0545	NTX030BA03	EXTENDED OPERATOR FEEDBACK DATA (BREAKDOWN BY CALL TYPE)
F0548	NTX030BA03	MULTI-TRAFFIC OFFICE OPERATION
F0551	NTX030CC10	AUTOQUOTE PRINTERS
F0552	NTX030CC10	HOTEL ADMINISTRATION SYSTEM (HADS)
F0553	NTX065AA10	SERVICE ANALYSIS TOPS
F0554	NTX030BA03	TRAFFIC SAMPLING
F0557	NTX030CC10	DIRECTORY ASSISTANCE HANDLING
F0559	NTX039AA01	OPERATOR CENTRALIZATION - HOST
F0560	NTX197AA01	CCIS DIRECT SIGNALLING
F0564	NTX042AA04	REMOTE ONI TO SP-1 TOPS
	NTX044AA04	
F0565	NTX042AA04	REMOTE ONI TO WE TSPS
	NTX044AA04	
F0568	NTX042AA04	AMA SINGLE ENTRY FORMAT
	NTX044AA04	
F0569	NTX076AA01	TRUNK IDENTIFIER IN AMA/SMDR RECORD
	NTX102AA04	
F0570	NTX042AA04	END OF TAPE ALARM
	NTX044AA04	
F0572	NTX042AA04	MAGNETIC TAPE LOCAL INHIBIT
	NTX044AA04	
F0573	NTX043AA03	LOCAL CALL DETAIL RECORDING
F0579	NTX042AA04	OPTION TO RECORD UNCOMPLETED CALLS
	NTX044AA04	
F0580	NTX044AA04	CAMA SUPERVISION ANSWER TIMING
F0581	NTX044AA04	CAMA SUPERVISION CALLED DISCONNECT TIMING
F0583	NTX044AA04	PRINTOUT ON ANI FAILURE
F0584	NTX044AA04	RECEIPT OF BELL ANI FORMAT
F0586	NTX042AA04	TOTAL CALLS SUMMARY ON AMA RECORD
	NTX044AA04	
F0591	NTX048AB01	CESIUM MASTER CLOCK INTERFACE
F0592	NTX048AA04	INCOMING PHASE DETECTION ON STANDARD DS-1 RATE INTERFACE
F0593	NTX048AA04	PRE-SELECTED ALTERNATE MASTER/SLAVE (PAMS) OPERATION

Feature Number	Feature Package	Feature Title
F0598	NTX049AD01	SINGLE PARTY REVERTIVE CALLING (INTERCOM)
F0602	NTX001AA21	TOLL CALLS WITHOUT PREFIX DIGIT 1
F0603	NTX049AE01	AMR-5 NORTH ELECTRIC ANI(GENERATION)
F0604	NTX049AC01	CIRCLE DIGIT IDENTIFICATION
F0607	NTX049AH01	COME AGAIN SIGNALLING
F0610	NTX049AG01	ITT ANI FORMAT (RECEIPT)
F0611	NTX193AA01	NORTH ELECTRIC ANI (RECEIPT AND REGENERATION)
F0614	NTX049AE01	TIME AND CHARGES SUBSCRIBER LINE CLASS
F0616	NTX051AA02	AUTOMATIC TRUNK TESTING FOR ORIGINATING TEST TYPES
F0619	NTX052AB02	INTERFACE TO CENTRALIZED ATT SYSTEMS VIA APC ROTL V
F0621	NTX053AA05	ALARM SENDING AND CHECKING
F0623	NTX053AA05	IDENTIFICATION OF ALARMS OUTPULSE ANI DIGIT 8
F0625	NTX901AA17	FRAUDULENT CALL PREVENTION
F0628	NTX053AA05	INCOMING/OUTGOING TRUNK IRREGULARITIES PEG COUNT
F0630	NTX053AA05	PERIODIC REPORTING ON TRUNKS
F0631	NTX053AA05	TROUBLE LOG EXPANSION
F0632	NTX054AA05	AUTOMATIC LINE TESTING
F0634	NTX054AA05	LTP - DIGITONE TESTING
F0635	NTX054AA05	LTP - MONITOR, TALK, BALANCE OFFHOOK TESTS
F0636	NTX054AA05	LTP - SEND FUNCTIONS(COIN & RINGING FUNCTIONS)
F0637	NTX054AA05	tone GENERATION
F0638	NTX054AA05	SW CONTROL OF CUT-OFF RELAY ON POSTED LINES
F0639	NTX055AB03	CIRCUIT MONITOR
F0642	NTX055AA03	TTP- CALL TRANSFER (LOCAL)
F0643	NTX055AA03	TTP- SCHEDULED STATUS REPORT
F0644	NTX055AA03	TTP- TRUNK STATUS QUERY
F0645	NTX055AA03	TTP- 101XX CALL ROUTING
F0650	NTX056AA04	DMO PRETESTING - TRUNK AND TRANSLATION
F0653	NTX056AA04	SERVICE ORDER ECHOING OF DMO-S (CABLE PAIR)
F0654	NTX056AA04	BULK DMO
F0655	NTX056AA04	JOURNAL FILE
F0656	NTX056AA04	PENDING ORDER FILE DUE DATE SPECIFICATION
F0657	NTX056AA04	PENDING ORDER FILE REMINDER MESSAGE
F0658	NTX056AA04	PENDING ORDER FILE RETRIEVAL BY SERVICE ORDER NO.
F0660	NTX056AA04	PENDING ORDER FILE VALIDITY CHECKS
F0661	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -CLEAX
F0664	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -W.E. NO.1 SXS
F0665	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -NT SXS
F0666	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -A.E. SXS
F0667	NTX057DA01	CUTOVER OF WORKING T1 LINES USING NAILED UP CONNECTIONS
F0668	NTX057EA01	
F0668	NTX057DA01	SOFTWARE CONTROLLED CUTOVER OF LINES
F0668	NTX057EA01	
F0670	NTX059AB04	POLLING AMA DATA VIA DATAPAC - MANUAL
F0671	NTX060BA02	AUTOMATIC OUT-OF-CHAIN ROUTING (AOOCR)
F0671	NTX060BB01	
F0672	NTX060BA02	HARD TO REACH CODE LIST (HTR)

Feature Number	Feature Package	Feature Title
F0673	NTX060BB01 NTX060BA02 NTX060BB01	SELECTIVE DYNAMIC OVERLOAD CONTROL (SDOC)
F0674	NTX060BA02 NTX060BB01	SELECTIVE TRUNK RESERVATION (STR)
F0685	NTX063AA02	108 TEST LINE (ECHO SUPPRESSION LOOP-AROUND)
F0686	NTX063AA02	DIGITAL ECHO SUPPRESSORS SERVICE CIRCUIT
F0687	NTX064AA01	AUTOMATIC LINE INSULATION TESTING (ALIT)
F0689	NTX065AA10	SERVICE ANALYSIS LINES
F0690	NTX065AA10	SERVICE ANALYSIS TRUNKS
F0691	NTX066AA02	BILINGUAL INTERFACE
F0700	NTX023AB03	LINE TESTING USING LTU
F0706	NTX023AB03	DCM-R DIAGNOSTIC
F0707	NTX023AB03	RLM MAINTENANCE
F0716	NTX023AB03	RLM - INTERFACE WITH BADGER 612A
F0717	NTX023AB03	RLM - INTERFACE WITH #3 LTC
F0719	NTX023AB03	VARIABLE QUANTITIES OF T1 LINE
F0720	NTX023AB03	REMOTE LINES WITH HOST OFFICE FEATURES
F0722	NTX023AB03	BASIC TRANSLATION AND ROUTING
F0731	NTX054AA05	LINE TRANSMISSION TESTS INSERTION LOSS
F0736	NTX053AA05	REMOTE MAKE BUSY
F0737	NTX052AB02	COMPATIBILITY WITH: CAROT
F0738	NTX052AB02	COMPATIBILITY WITH: RAMPART
F0743	NTX048AA04	SYNCHRONIZATION DISPLAY AND CONTROL
F0745	NTX042AA04	LAMA SUPERVISION ANSWER TIMING
F0746	NTX042AA04	LAMA SUPERVISION CALLED DISCONNECT TIMING
F0747	NTX019AA01	FREE EMERGENCY CALLING FROM: COIN LINES
F0748	NTX019AA01	FREE EMERGENCY CALLING FROM: MEASURED LINES
F0749	NTX019AA01	FREE EMERGENCY CALLING FROM: PUBLIC MOBILE RADIOS
F0751	NTX019AA01	911 CALL HOLD AND RINGBACK WITH ANI OUTPULSING
F0752	NTX019AA01	BUREAU FORCED DISCONNECT
F0753	NTX019AA01	CLG PARTY SWITCH HOOK STATUS AC SIGNALLING
F0754	NTX019AA01	BUREAU TO TRUNK INTEGRITY CHECK
F0755	NTX019AA01	OUTPULSING OVER 911 TRUNK
F0756	NTX019AA01	RINGBACK CODED RINGING
F0757	NTX430AA02	ESN - NETWORK WIDE AUTOMATIC ROUTE SELECTION
F0758	NTX103AA09	DIRECT INWARD SYSTEM ACCESS (DISA)
F0759	NTX103AA09	AUTHORIZATION CODES VERIFICATION AND RECORDING
F0761	NTX100AA20	UNIFORM NUMBERING PLAN CAPABILITY
F0771	NTX100AA20	BUSY VERIFICATION -TRUNKS
F0772	NTX100AA20	ATTENDANT TRANSFER
F0773	NTX100AA20	ATTENDANT ACCESS TO PAGING
F0774	NTX100AA20	SECRECY
F0776	NTX100AA20	CODE RESTRICTIONS
F0777	NTX100AA20	ACCESS TO CCSA
F0778	NTX100AA20	DIAL PULSE CONVERSION DP TO DTMF
F0779	NTX100AA20	DIAL PULSE CONVERSION DTMF TO DP
F0787	NTX100AA20	CLASS OF SERVICE RESTRICTIONS TOLL RESTRICTED SERVICE

Feature Number	Feature Package	Feature Title
F0789	NTX060AB10	ROUTE CONTROLS CANCEL TO
F0790	NTX060AB10	ROUTE CONTROLS SKIP REROUTE
F0799	NTX902AA07	DDD THROUGH TOPS ANI 1,2 PARTY
F0800	NTX902AA07	DDD THROUGH TOPS HOTEL/MOTEL
F0801	NTX901AA17	ONI 8-PARTY
F0802	NTX901AA17	ONI 10-PARTY
F0803	NTX901AA17	INTERFACE WITH CALRS
F0804	NTX901AA17	INTERFACE WITH AE# 30
F0805	NTX001AA21	ANALOG 4-WIRE INTERTOLL
F0806	NTX001AA21	ANALOG 2-WIRE INTEROFFICE
F0807	NTX001AA21	INFORMATION
F0808	NTX001AA21	SUBSTITUTE DIGITS (UP TO 11)
F0809	NTX001AA21	PROVISION OF 2048 TRUNK GROUPS (1-WAY & 2-WAY)
F0810	NTX001AA21	INTERFACE TO DMS-10, DMS-100, DMS-200
F0811	NTX001AA21	INTERFACE TO T1, DE2/DE3/D1D
F0812	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-SYSTEM DIAGNOSED H/W FAULTS
F0813	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-MAN-MADE BUSY USAGE
F0814	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-SYSTEM MADE BUSY USAGE
F0815	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-SYSTEM DETECTED ERROR PEG CNTS
F0816	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-SYS CALLED DIAGNOSTIC PEG CNTS
F0817	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-MATCH LOSS
F0818	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-BLOCK CALLS
F0819	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-USAGE
F0820	NTX001AA21	BASIC OPERATIONAL MEASUREMENT-TRAFFIC INDICATORS-PEG COUNTS
F0822	NTX001AA21	INTERFACE TO UDC DATA POLLER FOR OM
F0823	NTX001AA21	INTERACTIVE CRT FOR MTCE I/O HAZELTINE MODULAR ONE
F0824	NTX001AA21	INTERACTIVE CRT FOR MTCE I/O VT100
F0825	NTX001AA21	INTERACTIVE CRT FOR MTCE I/O CYBERNEX MDL-110
F0826	NTX901AA17	FREQUENCY SELECTIVE SYNCHROMONIC-16HZ BASE
F0827	NTX901AA17	REVERTIVE RINGING NO REVERTIVE RING
F0828	NTX901AA17	SUPERIMPOSED 8-PARTY SEMI SELECTIVE
F0829	NTX802AA04	COMBINED MF TRUNK GROUPS (1+, 0+, 0-, COIN, NON-COIN)
F0835	NTX001AA21	BASIC DATA MODIFICATION SYSTEM TRUNK DATA BASE QUERIES
F0836	NTX001AA21	BASIC DATA MODIFICATION SYSTEM EMERGENCY ACTIVATION
F0837	NTX001AA21	BASIC DATA MODIFICATION SYSTEM DEFAULT FOR CONSEC SIMILAR DMO
F0838	NTX001AA21	DISPLAY/PRINTER TERMINALS
F0839	NTX001AA21	CLASS 1 TO 5 SWITCHING
F0840	NTX001AA21	BUILT-IN TROUBLE SHOOT DIAG PROG TO ID ALL FAULTY SUB-UNITS
F0841	NTX001AA21	NORTH AMERICAN LOCAL AND DDD SWITCHING
F0842	NTX001AA21	NORTH AMERICAN PRECISE TONE PLAN

Feature Number	Feature Package	Feature Title
F0848	NTX100AA20	CONSULTATION HOLD
F0850	NTX049AL01	844 SERVICE CODE FOR TIME AND TEMPERATURE
F0851	NTX055AA03	TALK OVER TRUNK UNDER TEST
F0852	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST - S.C. XY
F0898	NTX176AA05	DATABASE DUMP
	NTX182AA04	
F0903	NTX176AA05	DATA DICTIONARY DUMP
F0913	NTX001AA21	QUERY AND DEFINE COMMAND CLASSES
F0915	NTX184AA09	CURRENT OCCUPANCY STATUS
F0916	NTX184AA09	PROVIDE DIRECTORY OF PP EXECUTIVE PROGRAMS
F0918	NTX184AA09	PRINTOUT LETTERS IN SYSTEM - ALL, IDLE, PROCS, OWNERS
F0919	NTX184AA09	PM MONITOR EXEC TRACE ON PM ACTIVITY BY TM TYPE
F0920	NTX184AA09	MONITOR SUBROUTINE USAGE
F0930	NTX030CC10	NON-COIN 0+, 0-
F0931	NTX030CC10	OPERATOR NUMBER IDENTIFICATION (ONI) CALLS
F0932	NTX030CC10	COIN 1+, 0+, 0-
F0933	NTX030CC10	HOTEL 1+, 0+, 0-
F0935	NTX030CC10	SERVICE CODE 121 (INWARD)
F0936	NTX030CC10	SERVICE CODE 181
F0937	NTX030CC10	SERVICE CODE 1150
F0938	NTX030CC10	SERVICE CODE 1155
F0939	NTX030CC10	SERVICE CODE 1156
F0940	NTX030CC10	SERVICE CODE 1158
F0941	NTX030CC10	SERVICE CODE 1159
F0942	NTX030CC10	PREFIX DIGIT
F0943	NTX030CC10	4 - SECOND TIMEOUT ON 0+ CALLS
F0944	NTX030CC10	TONE IDENTIFICATION OF ONI/ANIF CALLS
F0945	NTX030CC10	IDENTIFICATION OF: ALARMS, ANI ID 8
F0946	NTX030CC10	IDENTIFICATION OF: INTERCEPT, ANI ID 9
F0947	NTX030CC10	IDENTIFICATION OF: TRK CLASS HOTEL/MOTEL CALLS
F0948	NTX030CC10	IDENTIFICATION OF TRUNK CLASS SENT-PAID RESTRICTED CALLS
F0949	NTX030CC10	STATION TO STATION
F0950	NTX030CC10	PERSON TO PERSON
F0951	NTX030CC10	AUTOMATIC COLLECT
F0952	NTX030CC10	PERSON TO PERSON CALL BACK
F0953	NTX030CC10	DIAL RATE
F0955	NTX030CC10	AUTOMATIC NO AMA
F0956	NTX030CC10	CREDIT REQUEST
F0961	NTX030CC10	NOTIFY
F0964	NTX030CC10	TIME AND CHARGES AUTO PRT. ON T&C TTY
F0966	NTX030CC10	CAMA SUSPENSION
F0967	NTX030CC10	VERIFICATION
F0968	NTX030CC10	VOICE QUOTE OF CHARGES ON A CENTRAL TTY
F0972	NTX030CC10	AUTOMATIC COLLECTION OF DEPOSIT ON RELEASE
F0975	NTX030CC10	FLASH RECALL DURING INITIAL PERIOD
F0977	NTX030CC10	COIN CONTROL METHOD LINE NUMBER
F0978	NTX030CC10	COIN CONTROL METHOD INBAND
F0980	NTX030CC10	COIN CONTROL METHOD MULTIWINK

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F0984	NTX030CC10	V-H CO-ORDINATES CHARGE CALCULATION
F0992	NTX030CC10	POINT TO POINT RATING
F1006	NTX030BA03	SINGLE TRAFFIC OFF. OPERATION BASIC OPERATOR FEEDBACK
F1012	NTX030CC10	INSTRUCTIONAL DISPLAY
F1013	NTX030CC10	RATING MASS DMO
F1015	NTX030CC10	BELL SYSTEM STANDARD SIGNALLING FORMAT
F1020	NTX020AC01	CALL WAITING
F1022	NTX020AC01	SPEED CALLING SHORT LIST
F1023	NTX020AC01	SPEED CALLING LONG LIST
F1027	NTX021AA04	REMOTE CALL FORWARDING - LAMA MODE
F1030	NTX072AA01	COUNTRY CODE SCREENING (U.S)
F1031	NTX072AA01	INTERNATIONAL ROUTING TRANSLATION (U.S)
F1032	NTX072AA01	PREMIUM DIALLING (01+) (U.S)
F1033	NTX072AA01	STATION TO STATION (011+) (U.S)
F1034	NTX072AA01	2-STAGE OUTPUTSING TO GATEWAY (U.S)
F1044	NTX178AA01	BNR - AMA/CDR TAPE DUMP UTILITY PROG (AMATAPE)
	NTX182AA04	
F1052	NTX001AA21	ANALOG EAS TRUNK (1-WAY,2-WAY)
F1053	NTX001AA21	INPUT COMMAND SCREENING AUTOMATIC LOG ON
F1062	NTX001AA21	INPUT COMMAND SCREENING USER RESTRICTIONS
F1063	NTX001AA21	INTERFACE TO CO-LOCATED NE/AE SWITCHBRD I /C
F1064	NTX001AA21	INTERFACE TO CO-LOCATED NE/AE SWITCHBRD O /G
F1065	NTX059AB04	AUTOMATIC POLLING OM DATA VIA DATAPAC
F1066	NTX059AB04	POLLING AMA DATA VIA DATAPAC - AUTOMATIC
F1084	NTX802AA04	REPEAT TWO TEST
F1085	NTX802AA04	E&M TEST
F1100	NTX001AA21	TRUNKS - DIAL PULSE (10 PPS)
F1101	NTX001AA21	TRUNKS - MF (7DPS)
F1102	NTX001AA21	ALARMS CARRIER GROUP
F1103	NTX030CC10	TROUBLE REPORT
F1104	NTX030CC10	CLASS OF SERVICE TONE
F1105	NTX007AB02	HUNTING DIRECTORY NUMBER SEQUENTIAL
F1106	NTX007AB02	OVERFLOW TO: BUSY TONE
F1107	NTX030CC10	IDENTIFICATION OF: DIRECT HOTEL TRUNKS
F1108	NTX030CC10	COLLECT
F1109	NTX030CC10	THIRD NUMBER
F1110	NTX030CC10	SPECIAL BILLING
F1111	NTX030CC10	CREDIT CARD
F1112	NTX030CC10	VARIABLE INITIAL PERIOD
F1113	NTX030BA03	MECHANIZED FORCE ADMINISTRATION DATA SYSTEM (MFADS)
F1114	NTX042AA04	AUTOMATIC ROTATION OF STORAGE DEVICE
	NTX044AA04	
F1116	NTX054AA05	LINE TRANSMISSION TESTS QUIET TERMINATION
F1117	NTX054AA05	LINE TRANSMISSION TESTS MILLIWATT
F1119	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (DP)
F1120	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -#1 ESS

Feature Number	Feature Package	Feature Title
F1121	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST - SP-1
F1122	NTX136AA03	MANUAL OR SCHEDULED AUTOMATIC TESTS
F1123	NTX136AA03	ORIGINATION OF 105 TEST TYPES
F1125	NTX055AC02	NOISE MEASUREMENT
F1127	NTX030CC10	INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
F1130	NTX074AA06	LOADING/UNLOADING OF OFFICE IMAGE NON-RES
F1131	NTX074AA06	DATA RECORDING AND RECALL OPERATIONAL MEASUREMENTS
F1132	NTX074AA06	DATA RECORDING AND RECALL AUTOMATIC MESSAGE ACCOUNTING
F1133	NTX074AA06	DATA RECORDING AND RECALL LOG FILE
F1134	NTX074AA06	DATA RECORDING AND RECALL JOURNAL FILE
F1135	NTX074AA06	PENDING ORDER FILE ON DISK
F1139	NTX030CC10	NORTH ELECTRIC FORMAT
F1151	NTX100AA20	RING AGAIN
F1153	NTX110AA01	DO NOT DISTURB
F1155	NTX019AA01	RINGBACK
F1160	NTX100AA20	ACCESS TO EPSCS
F1161	NTX100AA20	ACCESS TO CO FROM PBX
F1162	NTX100AA20	ACCESS TO SPECIAL SERVICE FACILITIES
F1164	NTX100AA20	END TO END SIGNALLING
F1165	NTX100AA20	FOREIGN EXCHANGE (FX) TRUNK - ANALOG
F1171	NTX100AA20	OPERATIONAL MEASUREMENTS - IBN
F1172	NTX100AA20	AUTOMATIC LINE
F1173	NTX100AA20	BUSY VERIFICATION - STATIONS
F1174	NTX100AA20	DELAYED OPERATION
F1176	NTX100AA20	POSITION BUSY
F1177	NTX100AA20	SERIAL CALL
F1178	NTX100AA20	TRUNK GROUP BUSY INDICATION
F1180	NTX101AA13	DISTINCTIVE RINGING
F1181	NTX100AA20	MEET-ME CONFERENCE
F1182	NTX105AA03	OFF HOOK QUEUING ENHANCED
F1183	NTX433AA01	TIME OF DAY ROUTING
F1185	NTX430AA02	ESN - NETWORK CLASS OF SERVICE
F1188	NTX105AA03	AUTOMATIC ROUTE SELECTION
F1190	NTX902AA07	TWO WAY OPERATOR OFFICE TRUNKS(BELL)
F1191	NTX007AB02	DIRECT OUTWARD DIAL (DOD) ANALOG FACILITY
F1193	NTX042AA04	ONI SERVICES
F1193	NTX044AA04	ONI SERVICES
F1194	NTX055AC02	DIGITAL PAD ADJUSTMENT
F1195	NTX007AB02	PBX MESSAGE RATE
F1196	NTX001AA21	BASIC I/O INTERFACE
F1197	NTX023AB03	SIGNALLING CHANNEL SUPERVISION
F1198	NTX042AA04	BCD RECORDING
	NTX044AA04	
F1203	NTX176AA05	OFFICE RECORD REPORT OF WORKING SPARE TRUNK/LINES/LINE CARDS
F1214	NTX100AA20	MULTI-CUSTOMER OPERATION
F1215	NTX101AA13	AUDIO INPUT ON INCOMING CALLS IN QUEUE(ATTND & UCD)
F1217	NTX901AA17	INTERFACE WITH TERADYNE LOOP TEST UNIT

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F1218	NTX001AA21	TSMS PEG COUNT SOURCE AND DISPOSITION UP TO 16
F1219	NTX085AA05	TSMS PEG COUNT SOURCE AND DISPOSITION UP TO 128
F1220	NTX087AA04	TSMS USAGE SOURCE AND DISPOSITION UP TO 128
F1221	NTX088AA04	TSMS REPORT SUMMARIZED
F1226	NTX074AA06	DISK STORAGE OF PERIPHERAL LOADS
F1228	NTX090AA01	LOCAL COIN OVERTIME CHARGING
F1230	NTX100AA20	SIMPLIFIED DIALLING
F1231	NTX105AA03	CALL BACK QUEUING ENHANCED
F1234	NTX112AB03	CLASS 5 IBN OUTWATS
F1237	NTX100AA20	HUNTING
F1238	NTX021AA04	REMOTE CALL FORWARDING
F1239	NTX044AA04	AMA RECORD ON REMOTE/TOLL CALL FORWARDING
F1242	NTX030CC10	TOLL FREE CALLS
F1243	NTX030CC10	MASS DMO TEST PROGRAM
F1245	NTX204AA02	CCIS - BANDED SIGNALLING
F1246	NTX040AA03	CCIS - TOPS INTERWORKING
F1259	NTX250AA12	DATAPATH - HIGH SPEED DATA UNIT
F1262	NTX250AA12	SL-1 INTERWORKING
F1263	NTX100AA20	SERVICE ORDER SYSTEM
F1264	NTX100AA20	ACCESS TO
F1265	NTX100AA20	NIGHT SERVICE
F1270	NTX101AA13	EXECUTIVE BUSY OVERRIDE
F1272	NTX101AA13	UNIFORM CALL DISTRIBUTION
F1291	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST - AUTO TEL AND ELECTRIC CO.
F1292	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST - SA-1
F1297	NTX100AA20	CALL PARK
F1300	NTX001AA21	TRUNK I/F TO AE NO. 31 SWITCHBOARD
F1305	NTX049AD01	REA REVERTIVE CALLING
F1306	NTX053AA05	ALARM SENDING AND CHECKING - ADEMCO NO 669
F1307	NTX057AB05	AUTOMATIC BOARD TO BOARD TESTING
F1317	NTXA60AA01	OPERATOR CENTRALIZATION - REMOTE
F1319	NTX001AA21	PEG COUNT OF WARM AND COLD RESTARTS
F1323	NTX001AA21	LGC/DTC BASIC CALL PROCESSING & MAINTENANCE
F1324	NTX001AA21	LGT/DTC ACTIVITY SWITCHING
F1325	NTX001AA21	LGC/DTC CONTROLLED PORT DELOADING
F1334	NTX250AA12	INTERFACE TO AND OPERATION OF DATA UNIT
F1348	NTX901AA17	LCM BASIC CALL PROCESSING AND MAINTENANCE
F1353	NTX901AA17	FLEXIBLE LEN NUMBERING
F1357	NTX145AA05	RSC MAINTENANCE
F1358	NTX145AA05	RSC T1 MAINTENANCE
F1360	NTX145AA05	RSC RMM MAINTENANCE
F1361	NTX145AA05	RSC SIGNALLING CHANNEL SUPERVISION
F1366	NTX145AA05	RSC OPERATIONAL MEASUREMENTS
F1370	NTX145AA05	RSC METALIC LINE TESTING
F1371	NTX145AA05	RSC LINE TESTING USING LTU
F1378	NTX149AA02	RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BASIC

Feature Number	Feature Package	Feature Title
F1378	NTX149AB02	SERVICE RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BASIC SERVICE
F1382	NTX149AB02	RSC - ESA TRUNK CALL PROCESSING
F1383	NTX149AA02	RSC - ESA TRANSLATION
	NTX149AB02	
F1384	NTX149AA02	TAKE OVER/TAKE BACK
	NTX149AB02	
F1386	NTX149AA02	RSC ESA - AUTO UPDATE OF SUBSCRIBER/TRANSLATION DATA VIA DOW
	NTX149AB02	
F1387	NTX149AA02	RSC - ESA TABLE CONTROL
	NTX149AB02	
F1388	NTX150AA03	RSC INTRA SWITCHING LINES
F1389	NTX152AB01	RSC TRUNK INTASWITCHING DYNAMIC CHANNELS
F1390	NTX150AA03	RSC - INTRA SWITCHING
F1406	NTX152AB01	RSC - RCC TRUNK CALL PROCESSING
F1407	NTX152AB01	RSC - ROUTING CONTROL
F1420	NTX146AA03	RLCM BASIC
F1423	NTX146AA03	RLCM MAINTENANCE
F1424	NTX146AA03	RLCM FACILITY MAINTENANCE
F1426	NTX146AA03	RLCM RMM MAINTENANCE
F1447	NTX149AA02	RLCM ESA - BASIC PM MAINTENANCE LIN
	NTX149AB02	
F1449	NTX154AA03	ESA - TAKEOVER/TAKEBACK
F1450	NTX154AA03	ESA - TRANSLATION
F1451	NTX154AA03	RLCM ESA - TABLE CONTROL
F1452	NTX154AA03	RLCM ESA - CALL CONTROL
F1453	NTX156AA02	RLCM - INTRA SWITCHING
F1459	NTX178AA01	LOG ANALYSIS PROGRAM
F1463	NTX074AA06	ENHANCED DISK MNTCE
F1466	NTX055AB03	(NSG) TRANS. VERIF. DMS-250 IMT. DAL & ONAL TRK GRPS TYPES
F1471	NTX053AA05	NETWORK INTEGRITY ANALYSIS PACKAGE
F1474	NTX101AA13	OUTPULSING VERIFICATION USING DMIS
F1475	NTX100AA20	6 PORT CONFERENCE CIRCUIT USE CONTROL
F1476	NTX100AA20	INCREASE IN NUMBER OF CUSTOMER GROUPS
F1477	NTX100AA20	ATTENDANT RELEASE UPON COMPLETION OF DIALING
F1479	NTX119AA02	STATION MESSAGE WAITING
F1480	NTX100AA20	GOC-990 NXX CODE
F1481	NTX119AA02	P_PHONE MESSAGE WAITING
F1486	NTX901AA17	BCS12 ENHANCEMENTS
F1489	NTX001AA21	ENHANCED REAL TIME INDICATOR
	NTX291AA04	
F1492	NTX055AB03	TRANSLATION VERIFICATION ENHANCEMENTS
F1494	NTX060AB10	NETWORK MANAGEMENT IMPROVEMENTS
F1601	NTX170AA01	MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION
	NTX171CA02	
	NTX825AA02	

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F1602	NTX171CA02 NTX825AA02	MCCS - CUSTOMER DIALED ON TOPS TRUNKS
F1603	NTX172AA01 NTX825AA02	BILLED NUMBER SCREENING
F1604	NTX100AA20	TGB/TAC ACCESS THRU SPECIAL KEY
F1605	NTX100AA20	WILDCARD KEY
F1606	NTX100AA20	MAP DISPLAY FOR ATTENDANT OM
F1607	NTX105AA03	OFF-HOOK QUEUING
F1608	NTX001AA21	AUTOMATIC ALTERNATE ROUTING
F1623	NTX431AA03	CUT THROUGH DIALLING
F1624	NTX100AA20	DIAL TONE UPON TRUNK SEIZURE
F1625	NTX119AA02	ATTENDANT MESSAGE WAITING
F1626	NTX100AA20	NIGHT SERVICE
F1627	NTX105AA03	CALL BACK QUEING
F1629	NTX105AA03	EXPENSIVE ROUTE WARNING TONE
F1630	NTX110AA01	CODE RED/CODE BLUE
F1631	NTX111AA03	ATTENDANT CONFERENCE (LARGE)
F1632	NTX111AA03	MEET - ME CONFERENCE (LARGE)
F1633	NTX111AA03	STATION CONTROLLED CONFERENCE (LARGE)
F1634	NTX113AA01	PRECEDENCE CALL TRANSFER
F1636	NTX410AA02	DYNAMIC ATTENDANT CONSOLE MEASUREMENTS
F1639	NTX100AA20	PERMANENT HOLD
F1640	NTX100AA20	STATION CONTROLLED CONFERENCE (MAX 6 PORTS)
F1642	NTX100AA20	CONSOLE TEST
F1662	NTX176AA05	JOURNAL FILE PRINT UTILITY
F1665	NTX182AA04	COMMISSIONING LINE DIAGNOSTIC
F1666	NTX183AA04	DATA DUMP AND RESTORE
F1667	NTX001AA21	ALLOW CHANGES TO OFFICE CONFIGURATION TABLE
F1668	NTX184AA09	LEVEL 1 CAPACITY IMPROVEMENT AND MEMORY REDUCTION
F1669	NTX184AA09	TATS CTRSIM
F1670	NTX184AA09	TATS TRAFSIM
F1671	NTX184AA09	I/O SYSTEM STRAY NODE REMOVAL TOOL
F1672	NTX184AA09	LOG/REPORT EDITING UTILITY
F1673	NTX184AA09	IO FLOW CONTROL MODIFICATIONS
F1674	NTX184AA09	SYSTEM AUDIT PACKAGE - VERSION 1
F1675	NTX184AA09	PROGRAM STORE-OPTIMIZED OPCODES
F1677	NTX177AA01	TAPE COPY UTILITY
F1678	NTX177AA01	TAPE DIRECTORY PRESERVATION UTILITY
F1680	NTX177AA01	COMMAND SCREENING
F1681	NTX177AA01	PARAMETER QUERY
F1682	NTX178AA01 NTX182AA04	TRANSLATION OF CIRCUITS TO DIGITS DIALLED
F1683	NTX178AA01	OM TAPE PRINT UTILITY
F1719	NTX182AA04	AUTOMATIC LINE TEST COMMISSIONING
F1720	NTX182AA04	COMMISSIONING S/W UNLOAD VERIFICATION
F1721	NTX182AA04	DUMP OF OFFICE DATA FOR VERIFICATION
F1722	NTX182AA04	LINE APPARANCE TEST PROGRAM
F1723	NTX182AA04	NETWORK LINK TO LINE MODULE TESTS

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F1724	NTX182AA04	LINE DATA MODIFICATION
F1725	NTX182AA04	TOPS POSITION SIMULATOR
F1726	NTX182AA04	ENHANCED TRAFFIC SIMULATOR
F1729	NTX183AA04	CHANGE COMMAND CLASSES QUERY
F1730	NTX030CC10	REFORMATING OF DATA TABLE CONTENTS BETWEEN SOFTWARE LOADS
	NTX183AA04	
F1731	NTX186AA06	EAE0 - TRANSLATION AND CARRIER SCREENING
F1732	NTX186AA06	EAE0 - TRUNK TO AT & IC
F1733	NTX186AA06	EAE0 - NEW TREATMENTS
F1734	NTX186AA06	EAE0 - ORIGINATING AND TERMINATING BILLING
F1735	NTX085AA05	EAE0 TSMS CARRIER OVFL PC
F1736	NTX186AA06	EAE0 - NEW LOGS
F1737	NTX186AA06	EAE0 - ABBREVIATED DIAING
F1738	NTX060BA02	CODE CONTROL - EQUAL ACCESS
	NTX060BB01	
F1740	NTX386AA03	AT - TERMINATING BILLING
F1743	NTX100AA20	ATTENDANT CONSOLE DISPLAY (ENHANCEMENT 1)
F1744	NTX100AA20	tone DETECTION
F1746	NTX001AA21	PERMISSIVE 1 + DIALING
F1748	NTX204AA02	CCIS6 - CCS LINE INTERWORKING
F1750	NTX432AA01	NETWORK SPEED CALLING
F1751	NTX103AA09	AUTHORIZATION CODES
F1753	NTX430AA02	ESN - NETWORK INFORMATION SIGNALS
F1760	NTX101AA13	ESN - VARIABLE TYPES OF OUTPUTSING ON SAME CALL
F1763	NTX102AA04	ESN - ANSWER SUPERVISION GENERATION
F1767	NTX434AA01	TIME OF DAY NCOS
F1768	NTX060AB10	COUNTRY CODE BLOCKING
F1783	NTX100AA20	ATTENDANT CONSOLE DISPLAY (ENHANCEMENT II)
F1790	NTX112AB03	OHQ, CBQ FOR OUTWATS VFG
F1793	NTX040AA03	CCIS - SIGNALLING TERMINAL
F1796	NTX178AA01	NT - AMA/CDR TAPE DUMP UTILITY PROG (AMADUMP)
	NTX182AA04	
F1797	NTX101AA13	FLEXIBLE CONSOLE ALERTING
F1798	NTX021AA04	SERVICE ORDER FOR RCF
F1807	NTX106AA09	BUSINESS SET CALL WAITING
F1808	NTX106AA09	BUSINESS SET END TO END SIGNALLING
F1809	NTX106AA09	BUSINESS SET 3W CALLING / XFER
F1810	NTX106AA09	BISINESS SET LISTEN ON HOLD
F1812	NTX106AA09	BUSINESS SET ON HOOK DIALING
F1813	NTX106AA09	BUSINESS SET RING AGAIN FEATURE KEY S/W
F1814	NTX106AA09	BUSINESS SET SPEED CALLING FEATURE KEY S/W
F1815	NTX106AA09	BUSINESS SET CALL FORWARD ALL CALLS KEY S/W
F1816	NTX106AA09	BUSINESS SET CALL PICKUP FEATURE KEY S/W
F1817	NTX106AA09	BUSINESS SET SERVICE ORDER SYSTEM
F1818	NTX106AA09	BUSINESS SET AUTOMATIC LINES
F1819	NTX106AA09	BUSINESS SET MADN SCA (ACCESS SWITCH)
F1820	NTX106AA09	BUSINESS SET HELD CALLS
F1821	NTX106AA09	BUSINESS SET IBN BASIC CALLS

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F1823	NTX106AA09	BUSINESS SET POTS BASIC CALLS
F1826	NTX106AA09	BUSINESS SET AUTO ANSWER BACK
F1827	NTX106AA09	BUSINESS SET 6 PORT CONFERENCE
F1828	NTX106AA09	BUSINESS SET MAKE SET BUSY
F1829	NTX106AA09	BUSINESS SET INTERCOM
F1830	NTX106AA09	BUSINESS SET CALL PARK
F1832	NTX106AA09	BUSINESS SET MADN MCA
F1833	NTX106AA09	BUSINESS SET ADD ON MODULE SOFTWARE
F1834	NTX106AA09	BUSINESS SET INDIVIDUAL BUSINESS LINE
F1835	NTX106AA09	BUSINESS SET MALICIOUS CALL HOLD
F1837	NTX106AA09	BUSINESS SET PRIVACY RELEASE (ACROSS SWITCH)
F1838	NTX108AA05	BUSINESS SET DISPLAY CALLED NUMBER
F1839	NTX108AA05	CALL SOURCE ID
	NTX407AB01	
F1841	NTX108AA05	BUSINESS SET QUERY TIME KEY
F1848	NTX106AA09	BUSINESS SET BUSY OVERRIDE
F1880	NTX260AA02	PRESET CONFERENCE
F1884	NTX159AA06	ATT LAMA FORMAT ENHANCEMENT
F1885	NTX183AA04	TEXT EDITOR FOR SOS
F1887	NTX101AA13	DTMF OUTPULSING ON A LINE
F1888	NTX001AA21	PRIORITY MAP TERMINAL
F2054	NTX094AA01	FX LINE TERMINATION ON DCM
F2066	NTX001AA21	IDENTIFICATION OF INTERCEPT OUTPULSE ANI DIGIT 9
F2070	NTX001AA21	AUTOMATIC INTERCEPT SERVICE (OUTPULSED CALLED NUMBER)
F2113	NTX001AA21	INTERFACE TO SC XY FOR ANI/CAMA
F2120	NTX001AA21	VDU & PRINTER LINK TERMINAL CAPABILITY
F2139	NTX192AA01	REGENERATIVE ANI BELL FORMAT
F2151	NTX802AA04	LOCAL TANDEM (TOLL)
F2152	NTX901AA17	COIN CONTROL LINE NUMBER METHOD
F2159	NTX053AA05	BASIC OPERATIONAL MEASUREMENT-ACH CCH REGISTERS
F2169	NTX902AA07	DDD THROUGH TOPS ANI 4 PARTY
F2170	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -NXID
F2172	NTX035AA03	RONI /CKO FUNCTION
F2197	NTX901AA17	LINE CUT OFF RELAY OPERATION ON DISCONNECT
F2199	NTX044AA04	AMA RECORD OF TANDEM SWITCH SEIZURE - ONLY CALLS
F2200	NTX055AC02	SINGING POINT TEST
F2201	NTX055AC02	ECHO RETURN LOSS (ERL) TEST
F2207	NTX129AA02	TWO WAY OPERATOR OFFICE TRUNKS(TWOOT)
F2210	NTX053AA05	SILENT SWITCHMAN
F2223	NTX055AB03	TRANSLATION VERIFICATION - TRUNKS
F2224	NTX030CC10	TWO WAY OPERATOR OFFICE TRUNK (TWOOT)
F2231	NTX020AC01	THREE WAY CALLING
F2232	NTX020AC01	CALL FORWARDING (7/10 DIGITS)
F2250	NTX060AB10	PROTECTIVE RESERVATION EQPT INCREASED NO.OF RESERVED TRKS
F2255	NTX020AC01	FIXED CALL FORWARDING
F2258	NTX080AA02	INWATS RECORD ON AMA TAPE
F2264	NTX902AA07	SLEEVE LEAD CONTROL ORIGINATING AND TERMINATING

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F2268	NTX082AA01	SUBSCRIBER LINE PEG COUNT MEASUREMENT
F2269	NTX901AA17	REVERTIVE CALL PEG COUNT REGISTER
F2270	NTX902AA07	PEG COUNT ON TANDEM CALLS
F2271	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (MF)
F2279	NTX074AA06	14 INCH WINCHESTER DISK DRIVE
F2281	NTX801AA01	TEST LINES: LOOP AROUND
	NTX901AA17	
F2284	NTX902AA07	COINLESS PAY PHONE WITH INFO DIGIT 7
F2286	NTX030BA03	ASSIGNABLE GRADE OF SERVICE
F2287	NTX081AA01	EBCDIC RECORDING
F2289	NTX030CC10	IDENTIFICATION OF: ORIGINATING CLASS - ANI MATCH
F2295	NTX019AA01	CLG PARTY SWITCH HOOK STATUS DC SIGNALLING
F2303	NTX001AA21	DIGITAL RECORDED ANNOUNCEMENT
F2309	NTX065AA10	SERVICE ANALYSIS MONITOR LINK DIAL BACK
F2311	NTX176AA05	MECHANIZED LINE CARD ASSIGNMENT
F2312	NTX802AA04	COIN CONTROL LINE NUMBER METHOD
F2314	NTX001AA21	OM - OUTPUT ORDERING
F2317	NTX057AB05	AUTOMATIC BOARD TO BOARD TEST -MOTOR SWITCH OFFICE
F2319	NTX121AA01	OVERLAP OUTPUTSING TRUNK TO TRUNK
F2320	NTX801AA01	CLI - TRUNK TERMINATION
	NTX901AA17	
F2327	NTX176AA05	ENHANCED TRUNK INVENTORY AND SPARES TESTING
F2328	NTX030BA03	POSITION OCCUPANCY MEASUREMENT
F2331	NTX077AA01	PM LOADS IN MAIN MEMORY
F2332	NTX030CC10	SEMI AUTOMATIC ZENITH TOPS
F2334	NTX030CC10	TIME AND CHARGES RECALL TO OPERATOR
F2335	NTX030CC10	DOMESTIC BILLING RESTRICTIONS
F2336	NTX030CC10	MINIMUM CHARGE
F2337	NTX030CC10	VARIABLE LOCAL COIN CHARGE
F2338	NTX030CC10	EXPANDED OPERATOR DISPLAY
F2341	NTX008AB02	DMO COMMAND FOR DID SERVICE
F2344	NTX902AA07	TWO WAY OPERATOR OFFICE TRUNKS(BELL AND AMR-5)
F2345	NTX122AA02	BASIC OPERATIONAL MEASUREMENT - CALL DISPOSITION SUMMARY
F2348	NTX030CC10	SELECTIVE CALL SCREENING ANI ID-7
F2350	NTX120AA01	OFFICE HARDWARE INVENTORY PACKAGE
F2359	NTX112AB03	CLASS 5 IBN INWATS
F2360	NTX036AA01	INWARD VALIDATION
F2361	NTX082AA01	OM - DMO SELECTIVE SLU SCAN INTERVAL
F2365	NTX001AA21	OFFICE ID INTTY OUTPUT HEADER LABEL
F2368	NTX103AA09	SEPARATED OUTPUT FILE FOR IBN SMDR AND AMA
F2369	NTX100AA20	FX TRUNK DIGITAL 2 WAY
F2373	NTX030CC10	RATE PERIOD SPECIFIC BILLING
F2374	NTX096AA01	NOTIS FORMAT FOR TROUBLE REPORT
F2376	NTX057AB05	ABBT BEYOND METALLIC RANGE FOR RLM
F2377	NTX001AA21	TRUNK OUT OF SERVICE FOR DATA CHANGE
F2378	NTX098AA03	A T & T CAMA FORMAT
	NTX159AA06	

Feature Number	Feature Package	Feature Title
F2382	NTX099AA01	OM TRANSFER PERIOD AND HISTORY CLASS ENHANCEMENTS
F2393	NTX101AA13	INTERGROUP CALLING
F2394	NTX001AA21	REVERTIVE CALLS
F2395	NTX192AA01	COIN CONTROL CAPABILITY ON SC TRK GROUPS
	NTX193AA01	
F2399	NTX103AA09	SEPARATE SMDR OUTPUT FILES BY CUSTOMER GROUP
F2400	NTX127AA01	WARM LINE
F2403	NTX063AA02	ECHO SUPPRESSOR CIRCUITS - EXTENDED TO 5000
F2405	NTX030CC10	DELAY CALL DENIAL
F2411	NTX006AA04	TWO WAY WATS LINES
F2413	NTX030CC10	AMA RECORD OF SPECIFIED UNANSWERED CALL TYPES
F2420	NTX139AA01	REVERTIVE PULSING SIGNALLING ON DTC
F2422	NTX030CC10	INDEPENDANT COIN RECALL INTERVAL
F2423	NTX184AA09	S/W PROTECTION FOR NON-RES TAPES
F2427	NTX901AA17	CHARGE - A - CALL (COIN FREE DIALING)
F2428	NTX140AA02	300 BAUD DIAL-UP AUTOQUOTE
F2429	NTX141AA01	CITY ZONE RATING
F2430	NTX007AB02	ANSWER SUPERVISION TO PBXS FOR TOLL CALLS
	NTX008AB02	
	NTX094AA01	
F2431	NTX055BA01	RONI TRUNK TESTING
F2433	NTX901AA17	EXPANDED INBAND SIGNALLING
F2435	NTX157AA01	CCIS - INWATS OSO
F2436	NTX901AA17	DENIED ORIGINATION - 2/4 PARTY ANI
F2437	NTX901AA17	COIN FEATURES - A T & T DTF
F2438	NTX006AA04	6 DIGIT OUTWATS BAND SCREENING
F2439	NTX159AA06	A T & T - LAMA FORMAT
F2440	NTX160AA01	MULTIUNIT MESSAGE RATE SERVICES
F2441	NTX195AA05	MLT - PHASE I
F2442	NTX901AA17	958 990 660 SERVICE CODES - N.Y. TEL
F2446	NTX122AA02	BASIC OPERATIONAL MEASUREMENT - INEFFECTIVE MACHINE ATTEMPTS
F2449	NTX001AA21	1+ PERMISSIVE AND NON-PERMISSIVE DIALING IN THE SAME OFFICE
F2450	NTX901AA17	PER CALL LOOP TEST ON GROUND START LINES
F2453	NTX901AA17	ANI (BELL STANDARD) OUTPUTSING IN RESPONSE TO A WINK SIGNAL
F2454	NTX174AA03	AIOD(AUTO IDENTIFIED OUTWARD DIALING)
F2455	NTX175AA01	FLEXIBLE DISPLAY LANGUAGE
F2456	NTX030CC10	FLEXIBLE ANIID = 8,9 HANDLING
F2457	NTX001AA21	BERMUDA SPECIAL SERVICE CODES (9XX)
F2459	NTX094AA01	1 OR 2 WAY DID/DOD VIA DCM
F2460	NTX901AA17	DETECTION OF OPEN LINE AT MDF
F2461	NTX100AA20	SPECIAL INTERCEPT THROUGH SERVICE ORDER
F2463	NTX901AA17	INITIAL COIN RETURN/RETAIN OPTION
F2464	NTX085AA05	TSMS PEG COUNT ON IBN
F2465	NTX087AA04	TSMS USAGE ON IBN
F2466	NTX088AA04	TSMS REPORT SUMMARIZED ON IBN

Feature Number	Feature Package	Feature Title
F2468	NTX196AA02	CALLING NUMBER ANNOUNCEMENT (CNA)
F2469	NTX020AC01	TOLL CALL FORWARDING ENHANCEMENTS
F2472	NTX901AA17	TEST ACCESS VIA 660 CONCENTRATOR
F2475	NTX030CC10	AMA FAILURE ROUTING OPTIONS
	NTX042AA04	
	NTX044AA04	
	NTX102AA04	
F2482	NTX206AA01	UNAUTHORIZED DIGITONE SERVICE DETECTION
F2483	NTX094AA01	1 OR 2 WAY INWATS/OUTWATS VIA DCM
F2484	NTX085AA05	TSMS PDAB/PDTO PEG COUNT
F2485	NTX087AA04	TSMS PDAB/PDTO USAGE
F2486	NTX088AA04	TSMS REPORT SUMMARIZED FOR PDAB/PDTO
F2487	NTX207AA01	LCDR ON 2/4 PARTY LINES
F2489	NTX208AA02	AUTOMATIC COIN TOLL SERVICE (ACTS)
F2491	NTX901AA17	IMR/INW READ RESET BY NNX
F2493	NTX901AA17	TEST ASSIGNED/UNASSIGNED LEN(HOST & RLM)
F2494	NTX209AA03	ACCESS CHARGE RECORDING - END OFFICE (ATT FORMAT)
F2495	NTX210AA03	NO. 2 SCC INTERFACE
F2496	NTX211AA02	ACCESS CHARGE RECORDING - TANDEM (ATT FORMAT)
F2497	NTX901AA17	010 SERVICE CODE
F2499	NTX195AA05	MLT - ENHANCEMENT
F2500	NTX080AA02	INDIVIDUAL LINE BILLING ON INWATS CALLS
F2501	NTX901AA17	FLEXIBLE ANI ID = 8,9 ASSIGNMENT
F2502	NTX007AB02	CALLED PARTY HOLD ON CALLS TO PBX
	NTX008AB02	
	NTX094AA01	
F2505	NTX021AA04	RCF ENHANCEMENTS
F2510	NTX057BA01	AUTOMATIC BOARD TO BOARD TESTING SPEED-UP
F2511	NTX901AA17	AUTOMATIC LINE TESTING - SPEED UP
F2512	NTX159AA06	IBN COMPATIBILITY WITH ATT LAMA FORMAT AND MUMR
F2513	NTX210AA03	REMOTE SURVEILLANCE AND CONTROL
F2514	NTX243AA07	AMA TELEPROCESSING SYSTEM(AMATPS)
F2515	NTX244AA02	SEQUENTIAL TRUNK SELECTION
	NTX244AB01	
F2519	NTX901AA17	TOLL DIVERSION ENHANCEMENTS
F2520	NTX080BA01	BILLING ON TERMINATING CALLS TO A LINE
	NTX080CA01	
	NTX083AA01	
F2521	NTX053AA05	FLEXIBLE ALARM SENDING
F2522	NTX245AA01	ELIMINATION OF SPB, FNT AND FLAT RATE OPTIONS
F2524	NTX103AA09	AUTHORIZATION CODE IMMEDIATE DIALLING
F2525	NTX100AA20	ATTENDANT CALL PARK RECALL TIMER
F2526	NTX100AA20	IBN QUANTITY CONTROL(100 LINES)
F2527	NTX030CC10	TOPS - CHARGE_A_CALL ENHANCEMENTS
F2528	NTX262AA01	IMMEDIATE NOTIFICATION OF PRIORITY ENQUEUED CALLS
F2531	NTX101AA13	DISTINCTIVE AND RING AGAIN RINGING-MF
F2533	NTX290AA01	TANDEMING/SUPERVISION AND TREATMENT UPON ATB
F2536	NTX001AA21	CRITICAL MESSAGE PRIORITIZATION

Feature Number	Feature Package	Feature Title
F2538	NTX902AA07	ESSENTIAL SERVICE PROTECTION (ESP)
F2540	NTX048BA02	SYNCHRONIZATION - STRATUM 3
F2542	NTX057EA01	LM CUTOVER BY DN
F2547	NTX219AB03	TEEN SERVICE
F2549	NTX100AA20	IBN CALL FORWARDING VALIDATION
F2554	NTX001AA21	LOW VOLTAGE ALARM
F2555	NTX218AA03	1A/1B EADAS - BX.25 INTERFACE
F2557	NTX048CA02	SYNCHRONIZATION - STRATUM 2
F2564	NTX268AA02	ACCESS CHARGE RECORDING - END OFFICE (NT FORMAT)
F2565	NTX395AA01	REMOTE MAKE BUSY VIA SCAN POINT
F2566	NTX001AA21	BELL(U.S.) STANDARD ANNOUNCEMENTS VIA PROM
F2569	NTX277AA02	DIALABLE CABLE LOCATOR TONE
F2570	NTX277AA02	DIALABLE SHORT CIRCUIT
F2573	NTX057DA01	DTC CUTOVER FEATURE
F2576	NTX385AA01	OM THRESHOLDING AND ALARMS
F2578	NTX445AB01	OM SELECTIVE PRINTOUT
F2579	NTX065AA10	S.A.INCREASEED SAMPLE RATE
F2581	NTX394AA01	TOPS - CREDIT CARD DIGIT CHECK
F2585	NTX901AA17	TEST ACCESS OF INDIVIDUAL LINES IN A HUNT GROUP
F2588	NTX001AA21	AUTOMATIC BUSY OUT OF TRUNKS UPON INTEGRITY CHECK FAILURE
F2589	NTX020AC01	CUSTOM CALLING - 4 SECOND DELAY CANCELLATION
F2591	NTX042AA04	FLEXIBLE LONG DURATION CALL REPORTING
F2599	NTX044AA04	
F2599	NTX001AA21	KP & ST ACCEPTANCE ON AN ONI CALL
F2602	NTXA60AA01	REMOTE ONI VIA O.C.
F2605	NTX035AA03	
F2605	NTX134BA02	
F2605	NTX871AA01	
F2605	NTXA60AA01	TOPS CLOSEDOWN
F2606	NTX901AA17	REVERTIVE CALLING - RINGING TO BOTH PARTIES ON 4 PARTY ONI
F2610	NTX190AA01	ACCESS CHARGE RECORDING - TANDEM(NT FORMAT)
F2615	NTX165AA06	IBN/ESN CALLS IN BELLCORE AMA FORMAT
F2619	NTX187AA03	TOPS - OPERATOR FLEXIBLE ROUTING
F2620	NTX187AA03	TOPS - ANI FORWARDING ON 0-CALLS
F2621	NTX187AA03	TOPS - ANI SIGNALLING COMPATIBILITY
F2622	NTX645AA01	TOPS - LONG DISTANCE DIRECTORY ASSISTANCE
F2623	NTX901AA17	STATION RINGER TEST - 3 DIGIT ACCESS CODE
F2624	NTX006AA04	OUTWATS TWO DIGIT ZONE SUPPORT
F2627	NTX030CC10	V AND H LATA RATE ENHANCEMENT
F2632	NTX001AA21	PASSWORD COMMAND (SHOWPW)
F2634	NTX188AA02	BELL(U.S.) AMA FORMAT COMPATIBILITY
F2635	NTX187AA03	TRUNK SIGNALLING PROTOCOL/FORMAT CONVERSION
F2653	NTX901AA17	COD OPTION ON OFFICE BASIS
F2660	NTX001AA21	TREATMENT OMS - SEPARATE CATEGORIES
F2664	NTX445AB01	OM - GROUP TOTALS
F2666	NTX001AA21	OM - ACT. CALL DISP OFZ
F2667	NTX001AA21	OMS ON PER PM BASIS

Feature Number	Feature Package	Feature Title
F2670	NTX901AA17	PERMANENT SIGNAL TIME OUT - OPEN INTERNAL
F2680	NTX171CA02	LIMIT TO NUMBER OF SEQUENCE CALLS
	NTX825AA02	
F2682	NTX100AA20	CUSTOMER GROUP TRANSPARENCY
F2686	NTX901AA17	SO - SYSTEM RESPONSE TO QDN
F2688	NTX196AA02	CNA ENHANCEMENTS
F2691	NTX455AA01	1A/1B EADAS/NM - BX.25 INTERFACE
	NTX455AB01	
F2692	NTX001AA21	LOCAL AUDIBLE ALARM RETIREMENT
F2693	NTX210AA03	NO.2 SCC CRITICAL INDICATOR ENHANCEMENT
F2695	NTX213AB02	DMS-1 LINE TEST VIA LTA
F2699	NTX001AA21	LOW VOLTAGE ALARM LOG MESSAGE
F2700	NTX030CC10	PSEUDO HOTEL NXX TABLES
F2708	NTX020AC01	OM - PC OF POTS FEATURE ACTIVATION
F2710	NTX001AA21	REORDER PURGE - IBN
F2711	NTX807AA01	CANCEL CALL WAITING - POTS
	NTX807AB01	
F2713	NTX735AA01	FLEXIBLE ANI INFORMATION DIGIT ASSIGNMENT
F2714	NTXA81AA01	EXTENSION BRIDGED SERVICES
F2715	NTX001AA21	FREEZEONREINIT PARAMETER
F2720	NTX106AA09	SHORT HUNT ON BUSINESS SET
F2725	NTX103BA02	STATION SPECIFIC AUTH CODES
F2727	NTX717AB01	TRUNK VERIFICATION FROM DESIGNATED STATION
F2735	NTX105AA03	IBN OFF-HOOK QUEUING OMS
F2737	NTX030CC10	FRACTIONAL TAX
F2739	NTX898AA01	VARIABLE SPEED CALL ACCESS CODE
F2740	NTX100AA20	VARIABLE LENGTH/SAME LEADING DIGIT(S) TRANSLATION
F2746	NTX165AA06	CCSA LINE OPTION
F2747	NTX165AA06	CCSA VFG OPTION
F2749	NTX006AA04	INWATS COMPLETION FROM LOCAL SOURCE
F2750	NTX007AB02	HUNT GROUP SIZE EXPANSION
F2751	NTX901AA17	0+ DA AND 0+ 800 PERMISSIVE DIALING
F2752	NTX007AB02	DNH WITH CWT AND PREFERENTIAL HUNT OPTIONS
F2758	NTX043AA03	COMPATIBILITY OF LCDR OPTION ON CDF AND CCF COIN LINES
F2759	NTX098AA03	CALL CODE 009,003 & 121 ASSIGNMENT VIA TRANSLATION
	NTX159AA06	
F2768	NTX083AA01	FGA TERMINATING RECORD
F2772	NTX711AA02	EA PRESUBSCRIPTION REPORTS
	NTX711AB02	
F2775	NTX030CC10	QUEUE SELECTION ON TRUNK GROUP BASE
F2776	NTX030CC10	0+ LOCAL CALLS ON DMS-200 TOPS
F2777	NTX045AA01	CALL FORWARDING - USAGE SENSITIVE PRICING(BELLCORE FORMAT)
F2780	NTX174AA03	AIOD FOR TIE TRUNKS
F2781	NTXA43AA01	CALL FORWARD REMOTE ACTIVATION
F2791	NTX101AA13	ATTENDANT CONSOLE END-TO-END SIGNALLING
F2792	NTX074AA06	DDU IMAGE VOLUME SIZE INCREASE
F2793	NTX098AA03	DATAPATH AMA FORMAT-CALL CODES 072,117,121
	NTX159AA06	

Feature Number	Feature Package	Feature Title
F2795	NTX100AA20	QUERY FUNCTIONAL STATION GROUPINGS
F2797	NTX213AB02	SCMR DYNAMIC CHANNEL REASSIGNMENT
F2800	NTX808AA01	3-WAY CALL CHAINING
	NTX820AA01	
F2801	NTX806AA01	CALL FORWARDING - BUSY LINE (CFBL)
F2802	NTX806AA01	CALL FORWARDING - NO ANSWER (CFNA)
F2805	NTX106AA09	AUTOMATIC LINE AND MADN
F2810	NTX807AB01	CALL WAITING FOR 3-WAY CALLING
	NTX824AB01	
F2811	NTX147AB01	OPM SCHEDULED BATTERY ROTATION
F2812	NTX030BA03	15 MINUTE REPORTS FOR MFADS
F2815	NTX021AA04	MESSAGE RATE REMOTE CALL FORWARDING BASE DN
F2817	NTX001AA21	PROTECTION OF UNEXPIRED TAPES
F2818	NTX001AA21	DIRP SECURITY ENHANCEMENT
F2820	NTX100AA20	IBN - CALL FORWARD DO-NOT ANSWER(CFDA) FROM IBN HUNT GROUP
F2822	NTX103AA09	IBN AUTH CODES FOR ALTERNATE ROUTE SELECTION(ARS)
F2826	NTXA84AA01	MUSIC-ON-HOLD FOR EBS
F2828	NTX048CA02	STRATUM II - DRIFT INDICATION
F2837	NTX878AB02	OPTIONAL PRIVACY ON MADNS
F2851	NTX108AA05	CALL FORWARD DESTINATION DISPLAY
F2853	NTX734AA01	EAE0 - IBN PIC USING SERVORD
F2855	NTX714AA01	TOPS INTERLATA CARRIER SERVICE
F2856	NTX030CC10	TOPS COIN SUPV. SIG. OPTION
F2857	NTX713AA01	LATAWIDE CENTREX BILLING
F2863	NTX719AA01	BUSINESS SET BUSY INDICATOR
F2864	NTX106AA09	BUSINESS SET - 36 BUTTON ADD ON SUPPORT
F2875	NTX001AA21	CLOSE LOGS TO SCCS AFTER RESTARTS
F2876	NTX885AB01	SCHEDULED TESTING OF DMS NETWORK
F2877	NTX885AA02	NETWORK PATH DIAGNOSTICS
	NTX885AB01	
F2879	NTX243AA07	DISPLAY DPP THROUGH IOD LEVEL
F2881	NTX732AA02	SIMPLIFIED MESSAGE DESK INTERFACE (SMDI)
F2882	NTX821AA01	LATA SCREENING ON 0+ CALLS
F2883	NTX270AA12	INCOMING START-TO-DIAL DELAY(ISDD)MEASUREMENT
F2885	NTX733AA02	ENHANCED SERVICE ORDER
	NTX733AB02	
	NTX733AC01	
F2886	NTX711AA02	PRESUBSCRIPTION INDICATOR
	NTX711AB02	
F2887	NTX030CC10	NPA ON 0+ SEVEN DIGIT LOCAL CALLS
F2888	NTX822AA01	EBS AS A MESSAGE CENTER
F2889	NTX878AB02	PRIVACY RELEASE CONFERENCE CONTROL
F2895	NTX100AA20	OPTIONAL ANSWER SUPERVISION FROM ATTENDANT QUEUE
F2896	NTX737AA01	FLEXIBLE BC AMA CALL CODES
	NTX737AB01	
F2900	NTX244AB01	CIRCULAR TRUNK HUNTING
F2901	NTX803AA02	FGD-EA ALTERNATE SWITCHING POINT ROUTING
F2904	NTX398AA10	PROGRAMMABLE POWER/MISC ALARM

Feature Number	Feature Package	Feature Title
F2906	NTX825AA02	EXCHANGE ALTERNATE BILLING SERVICE
F2909	NTX989AA01	CARRIER ACCESS CODE BLOCKING FOR IC/INC
F2910	NTX711AB02	EA PRESUBSCRIPTION REPORTS ON IBN
F2915	NTX806AA01	MULTIPLE SIMULTANEOUS CALL FORWARDING
F2916	NTX843AA01	TYPE 2A CELLULAR INTERCONNECTION
F2917	NTX850AA01	TOPS ALTERNATE ANNOUNCEMENT
F2918	NTX030CC10	COIN FIRST-RETURN ON DISCONNECT
F2919	NTX398AA10	SCM-100S-FREQUENCY SELECTIVE RINGING
F2920	NTX188AA02	TOPS CALL CODE 009 FOR DA
F2922	NTX045AA01	LINE DENIAL OF USP VERTICAL PARTS.
F2923	NTX851AA01	SMDR VIA RAO - BELLCORE AMA RECORD
F2925	NTX733AB02	ENHANCED SERVORD II
	NTX733AC01	
F2926	NTX733AA02	CLEN FOR EBS
	NTX733AB02	
	NTX733AC01	
F2931	NTX901AA17	DTSR ON A PER PM BASIS
F2935	NTX901AA17	CALL FWD ASGNMT TO PBX MESS RATE LINE (CFW FOR PBM)
F2938	NTX871AA01	REMOTE TOPS MP O.C.-DATA LINK HANDLING
F2940	NTX873AA01	HOST TOPS MP O.C.-DATA LINK HANDLING
F2942	NTX291AA04	NEW CC REAL TIME INDICATOR
F2945	NTX875AA01	PTS TO CCS7 MASS TRUNK CONVERSION
F2946	NTX856AA02	IBN ATTENDANT CONSOLE OM ON AN INDIVIDUAL CONSOLE BASIS
F2948	NTX732AA02	SMDI CALL RETRIEVAL BILLING
F2953	NTX877AA01	NON-DATA LINK CONSOLE CALL EXTENSION
F2956	NTX878AB02	LAST NUMBER REDIAL ASSOCIATED TO H SET
F2957	NTX878AB02	INDIVIDUAL PAGE FROM GIC
F2958	NTX030CC10	TOPS CROSSBAR SIGNALLING
F2959	NTX891AA01	TOPS - EXCHANGE ACCESS OPERATOR SERVICES SIGNALLING
F2960	NTX888AA01	EAE0 EXCHANGE ACCESS OPERATOR SERVICES SIGNALLING
F2963	NTX878AB02	RING AGAIN ON IDLE EBS
F2964	NTX878AB02	MAKE SET BUSY EXCEPT GIC
F2967	NTX878AB02	CALL PARK RECALL IDENTIFICATION
F2969	NTX103AA09	DISA CALL PROMPTING DEFAULT DESTINATION
F2970	NTX899AA01	CONFIDENTIALITY ALERTING ON CALL TRANSFER
F2975	NTX987AA01	ENHANCED FIBER MONITORING
F2982	NTX856AA02	PEG COUNTS ON LISTED DIRECTORY NUMBERS ON ATTENDANT CONSOLES
F2987	NTX878AB02	ORIGINATING/TERMINATING LINE SELECT
F2989	NTXA77AA01	UCD ON EBS SET AND UCD SD POINT
F2995	NTX250AA12	TCM SYNC LOSS IDENTIFICATION
F2996	NTXE60AA01	CUG FOR THE US MARKET
F3010	NTX065AA10	SERVICE ANALYSIS DMS-300
F3100	NTX270AA12	MSB - DTC NUC BASIC MTCE
F3101	NTX270AA12	NPE - MSB MAINTENANCE
F3103	NTX270AA12	DMO - FOR NEW PERIPHERAL MODULES
F3104	NTX270AA12	NPE - LCM MAINTENANCE
F3106	NTX270AA12	NPE - LGC/DTC MAINTENANCE

Feature Number	Feature Package	Feature Title
F3107	NTX270AA12	NPE - PM LOADER
F3118	NTX270AA12	DIAL TONE SPEED RECORDING FOR LCM
F3151	NTX204AA02	CCIS - TRUNK TO LINE CP
F3152	NTX204AA02	CCIS - TRUNK FROM LINE CP
F3153	NTX040AA03	CCIS - DATA EXTRACTION/INSERTION
F3154	NTX204AA02	CCIS - BASIC MAINTENANCE
F3157	NTX250AA12	DATAPATH - LOOP TESTING
F3160	NTX250AA12	DATAPATH - SERVICE ORDERS
F3161	NTX250AA12	DATAPATH - CALL PROCESSING
F3163	NTX250AA12	DATAPATH - SPEED CALLING
F3164	NTX250AA12	DATAPATH - AUTOMATIC LINE
F3165	NTX250AA12	DATAPATH - HUNT GROUPS
F3166	NTX250AA12	DATAPATH - ESN DIGITAL DATA CONNECTIVITY
F3167	NTX250AA12	DATAPATH - RING AGAIN
F3169	NTX250AA12	DATAPATH - DU/DLC BPV COUNT
F3172	NTX250AA12	DATAPATH - DATA LINE CARD
F3173	NTX251AA05	OUTBOUND MODEM POOLING
F3174	NTX251AA05	INBOUND MODEM POOLING
F3177	NTX250AA12	DATAPATH KEYBOARD DIALING
F3300	NTX213AB02	SCM-100R CC CALL PROCESSING
F3302	NTX213AB02	SCM-100R CC MAINTENANCE
F3303	NTX213AB02	SCM-100R PP MAINTENANCE
F3304	NTX213AB02	SCM-100R CC ALARMS
F3306	NTX213AB02	SCM-100R OPERATIONAL MEASUREMENTS
F3307	NTX213AB02	SCM-100R LOGS
F3308	NTX213AB02	SCM-100R CC PROTECTION SWITCHING FOR SMR
F3309	NTX213AB02	SCM-100R ADMINISTRATION
F3310	NTX213AB02	SCM - 100R PP CALL PROCESSING
F3320	NTX074AA06	150 MB DISK SUPPORT
F3331	NTX001AA21	NPE - REWORK OF PM MAP DISPLAY
F3334	NTX292AB03	ENHANCED COMMAND SCREENING
F3335	NTX292BA02	PASSWORD CONTROL
F3336	NTX292AB03	ACCESS CONTROL
F3337	NTX292BA02	AUDIT TRAIL
F3338	NTX293AA02	AUTOMATIC DIAL BACK
F3339	NTX292AB03	AUTOMATIC LOGOUT OF DIAL-UP LINES
F3342	NTX250AA12	DU MONITOR/CO LOOPBACK
F3343	NTX025AA02	ABBREVIATED DIALING IN ESA MODE
F3344	NTX001AA21	102 TEST LINE TERMINATION (-10/-15DB)
F3348	NTX001AA21	NEW O/G IDLE SUPREVISION
F3349	NTX001AA21	TRUNK SIGNAL TIMING CHANGES
F3350	NTX270AA12	NPE - OM FOR LGC/DTC
F3351	NTX057DA01	NEW PERIPHERAL POTS LINE CUTOVER SUPPORT

Feature Number	Feature Package	Feature Title
F3352	NTX057EA01	
F3353	NTX901AA17	6X17AA LINE CARD FACILITY MAINTENANCE
F3354	NTX901AA17	MTA GATING FACILITY
F3381	NTX057AB05	NEW PERIPHERAL POTS LINE BOARD TO BOARD TESTING
F3383	NTX901AA17	LINE STATUS IN JOURNAL FILE
	NTX176AA05	JOURNAL FILE DUMP FACILITY
	NTX182AA04	
	NTX183AA04	
F3388	NTX106AA09	BUSINESS SET CALL BACK QUEUING
F3389	NTX106AA09	BUSINESS SET EXTENSION SETS
F3390	NTX171CA02	MCCS - CUSTOMER DIALED ON LINES
	NTX825AA02	
F3391	NTX171CA02	MCCS - CUSTOMER DIALED SEQUENCE CALLS
	NTX825AA02	
F3393	NTX286AA01	MCCS - QUERY VIA OC DATA LINK
F3395	NTX170AA01	MCCS - OPERATOR ASSISTED CCV
	NTX171CA02	
	NTX825AA02	
F3406	NTX154AA03	RLCM - ESA MAINTENANCE SUPPORT
F3407	NTX270AA12	LOADER ENHANCEMENTS
F3408	NTX001AA21	DEFAULT DATA
F3410	NTX108AA05	BUSINESS SET FEATURE DISPLAY
F3411	NTX100AA20	ATTENDENT AUTODIAL
F3413	NTX119AA02	MESSAGE WAITING LAMP - LINK PHONE
F3414	NTX119AA02	MESSAGE WAITING LINE CARD FACILITY MNTC
F3416	NTX106AA09	MADN SERVICE ORDERS
F3433	NTX055AB03	STS CONVERSION
F3434	NTX901AA17	DATA FACILITES FOR 3X09MTA
F3435	NTX901AA17	UTILITIES FOR 3X09MTA
F3436	NTX901AA17	TTP SUPPORT FOR 3X09MTA
F3437	NTX386AA03	AT - TRANSLATION AND SCREENING
F3438	NTX386AA03	AT - TRUNKING
F3439	NTX386AA03	AT - TREATMEMTS
F3440	NTX386AA03	AT - OPERATIONAL MEASUREMENTS
F3441	NTX386AA03	ATT - LOG REPORTS
F3446	NTX119AA02	STUTTERED DIAL TONE FOR MESSAGE WAITING
F3448	NTX399AA01	IBN AND ESB COMPATIBILITY
F3451	NTX100AA20	STORING OF 24 DIALED DIGITS
F3452	NTX106AA09	BUSINESS SET GROUP INTERCOM
F3453	NTX106AA09	BUSINESS SET AUTOMATIC LINE
F3458	NTX101AA13	ACD MUSIC ON DELAY
	NTX407AB01	
F3460	NTX251AA05	MODEM POOL DATA UNIT
F3461	NTX001AA21	DRA - RECORDING ON EE PROM
F3473	NTX001AA21	TERMINATING NPA AMA RECORDS
F3475	NTX901AA17	LM/RLM WARM TAKEBACK
F3476	NTX901AA17	LM/RLM WARM TAKEOVER
F3478	NTX213AB02	SCM-100 OPERATOR VERIFICATION

Feature Number	Feature Package	Feature Title
F3479	NTX398AA10	
F3480	NTX213AB02	SCM - 100R 2 PARTY ANI
F3483	NTX213AB02	SCM - 100R PP COIN FUNCTIONS
F3484	NTX001AA21	VARIABLE TIMING - DP TRUNK RECEPTION AND OUTPULSING
F3485	NTX435AA02	DIAL - CALL WAITING
F3486	NTX435AA02	CALL HOLD
F3487	NTX435AA02	CALL WAITING - ORIGINATING
F3488	NTX435AA02	DIRECTED CALL PICK-UP - BARGE IN
F3489	NTX435AA02	DIRECTED CALL PICK-UP - NON BARGE IN
F3492	NTX436AA01	MVP DIAL PLAN
F3498	NTX437AA01	RANDOM CONDITIONAL ROUTING
F3499	NTX213AB02	T1 MTCE FOR REMOTE LINKS
F3705	NTX001AA21	RADR WITH DTMF
F3707	NTX060BA02	SELECTIVE INCOMING LOAD CONTROL(SILC)
F3716	NTX060BB01	
F3718	NTX065AA10	AOSS SERVICE ANALYSIS
F3720	NTX030CC10	TOPS - KEY FUNCTION ENHANCEMENTS
F3723	NTX030CC10	TOPS - AMA RECORDS VERIFICATION
F3724	NTX030CC10	TOPS VERIFICATION SCRAMBLING & TONE OPTIONS
F3727	NTX213AB02	RSB LINE MAINTENANCE
F3728	NTX213AB02	MAP LINE MAINTENANCE
F3729	NTX174AA03	AIOD - DATA STRUCTURES/TABLE CONTROL
F3730	NTX174AA03	AIOD - MAINTENANCE UTILITIES
F3731	NTX174AA03	AIOD - PBX TRUNK & LINE OPTIONS
F3732	NTX174AA03	AIOD - CALL PROCESSING
F3733	NTX174AA03	AIOD - OPERATIONAL MEASUREMENTS
F3735	NTX174AA03	AIOD - LOGS & ALARMS
F3737	NTX030CC10	TOPS - EXPANDED INBAND COIN CONTROL
F3738	NTX106AA09	BUSINESS SET ADDONS & EXTN FACILITIES MAINTENANCE
F3739	NTX085AA05	EAE0 - PEG COUNT
F3740	NTX087AA04	EAE0 - USAGE
F3742	NTX088AA04	EAE0 - REPORT
F3746	NTX001AA21	PER CALL CAPACITY ENHANCEMENT
F3748	NTX074AA06	SEMI AUTOMATIC DIRP DISK TO TAPE COPY
F3756	NTX398AA10	SCM - 100S CC CALL PROCESSING
F3759	NTX398AA10	SCM - 100S CC MAINTENANCE
F3760	NTX052AB02	ROTL TRUNK NUMBER TABLE
F3768	NTX250AA12	DATAPATH DU PROFILE
F3776	NTX251AA05	MODEM POOLING PHASE II
F3777	NTX001AA21	TERMINATING NPA IN AMA RECORDS
F3778	NTX001AA21	OM TAPE - SUPPRESSION OF UNEQUIPPED MEMBERS(D RECORD)
F3779	NTX001AA21	OM PRINT - SUPPRESSION OF ZERO DATA
F3781	NTX001AA21	AMA REAL TIME ENHANCEMENTS(ATT FORMAT)
F3782	NTX001AA21	MINOR POF ENHANCEMENT
F3783	NTX100AA20	CCSA AMA RECORDING - TRUNK GRP TYPE
F3784	NTX435AA02	STATION ACTIVATED DND WITH FEATURE ACTIVE REMINDER
	NTX435AA02	DISTINCTIVE CALL WAITING TONES
	NTX412AA01	CUSTOMER SERVICE CHANGE VIA SERVORD

Feature Number	Feature Package	Feature Title
	NTX412BA01	
	NTX412CA03	
F3786	NTX101AA13	LAST NUMBER REDIAL(LNR)
F3788	NTX418AA01	SERVICE ANALYSIS FOR IBN
F3789	NTX112AB03	TRK GRP BUSY OF VIRTUAL FACILITY GRPS ON ATTENDANT CONSOLE
F3791	NTX112AB03	ATTENDANT CONTROL OF VFG
F3792	NTX431AA03	CUT THROUGH DIALING FOR IBN LINES AND A/C
F3795	NTX413AA01	A/C ACTIVATE/DEACTIVATE OF CFU/CFI
F3797	NTX103AA09	INCREASE AUTHCODES PER CUSTOMER GROUP
F3800	NTX411AA01	VMX INTERFACE
F3804	NTX413AA01	REWRITE IBN CALL FORWARDING
F3811	NTX001AA21	LOOP MONITOR ELIMINATION ON 2X83
F3812	NTX001AA21	SIX PORT CONT AS 2-THREE PORT CONT CKT
F3813	NTX001AA21	CALL TIMING OFFICE PARAMETER REVISION
F3815	NTX001AA21	CARRIER ENHANCEMENTS
F3820	NTX150AA03	INTRASWITCHING OMS
	NTX156AA02	
F3821	NTX901AA17	TYPE B LINE CARD MAINTENANCE
F3824	NTX001AA21	SYSTEM SPEED UP
F3825	NTX001AA21	OM OUTSIDE PLANT MEASUREMENTS - PHASE I
F3826	NTX001AA21	ENHANCED PRIORITY TERMINAL
F3827	NTX903AA01	INTEGRATED TERMINATING 105 TEST LINE & RESPONDER
F3828	NTX136AA03	ERL AND SRL CAPABILITY TO ATMS'
F3829	NTX272AA02	FOCUSED MAINTENANCE
F3830	NTX272AA02	FOCUSED LINE MAINTENANCE
F3832	NTX001AA21	MPC ROM MAINTENANCE AND CC CONTROLLER
F3833	NTX273AA07	MPC - OS
F3834	NTX273AA07	MPC - COMMAND INTERPRETER
F3835	NTX273AA07	MPC - IOC HANDLER
F3836	NTX273AA07	MPC - DATA LINK HANDLER
F3838	NTX273AA07	MPC - BX.25 LEVEL3
F3839	NTX273AA07	MPC - BX.25 LEVEL2
F3841	NTX112AB03	VFG USAGE DATA
F3842	NTX001AA21	DTMF OUTPUTSING ON DTCS WITHOUT SENDERS
F3844	NTX412CA03	CUSTOMER MANIPULATION OF TRUNK GROUP ROUTE LISTS
F3847	NTX412BA01	CUSTOMER NETWORK DATA CHANGES
	NTX412CA03	
F3854	NTX292AB03	SECURITY TABLE ENHANCEMENTS
	NTX292BA02	
F3860	NTX186AA06	FEATURE GROUP C AND D COMPATIBILITY
F3862	NTX000AA13	2.75 MW PROGRAM STORE
F3865	NTX001AA21	LM TAKEOVER/TAKE BACK DIAGNOSTIC
F3866	NTX001AA21	K AND S DSM INTEGRATION
F3870	NTX412AA01	PARTITIONED SERVICE ORDER SYSTEM
	NTX412BA01	
	NTX412CA03	
F3873	NTX426AA01	ASYNC LINE CARD MAINTENANCE
F3879	NTX001AA21	PM TO FACILITY MAINTENANCE IMPROVEMENTS

Feature Number	Feature Package	Feature Title
F3884	NTX000AA13	SANITY CHECK OUT
F3886	NTX398AA10	RCT AND RCS INVENTORY TABLE
F3888	NTX000AA13	FEATURE PACKAGE IN SOS
F3890	NTX901AA17	GUARANTEED DIAL TONE
F3895	NTX001AA21	PM MAINTENANCE ENHANCEMENTS
F3896	NTX293AA02	DIAL BACK ON OTHER MODEMS
F3897	NTX250AA12	DATAPATH DISCONNECT TIMEOUT
F3899	NTX250AA12	DATAPATH SPEED RESTRICTED CALLING
F3905	NTX562AA02	FILE TRANSFER FROM DMS TO NOS
F3906	NTX427AA04	MAP ALARM LEVEL SCREENING
F3907	NTX427AA04	CUSTOMER SCREENING AT THE TTP
F3908	NTX186AA06	EQUAL ACCESS ON IBN/DATAPATH
F3911	NTX213AB02	PP DIGITAL TEST HEAD
F3912	NTX213AB02	SCM-100R PP PROTECTION SWITCHING
F3913	NTX273AA07	PROTOCOL SUPPROT BX25
F3914	NTX273AA07	TABLES, MAINTENANCE I/O FILE SYSTEM
F3915	NTX273AA07	APPLICATION SUPPORT
F3916	NTX218AA03	EADAS - OM I/F
F3917	NTX218AA03	EADAS MMI
F3919	NTX218AA03	OM USAGE TO EADAS
F3920	NTX186AA06	OVERLAP CARRIER SELECTION
F3922	NTX407AB01	ACD NOT READY KEY
F3923	NTX407AB01	ACD INCALLS KEY
F3925	NTX414AA01	DIRECTED CALL PARK
	NTX571AA01	
F3926	NTX416AB02	ACD CALL FORCING
	NTX416AC01	
F3927	NTX416AB02	ACD EMERGENCY KEY
	NTX416AC01	
F3928	NTX415AA04	ACD OBSERVE AGENT KEY
F3929	NTX416AB02	ACD SUPERVISOR KEY
	NTX416AC01	
F3930	NTX407AB01	ATTENDANT CONSOLE TO ACD
F3931	NTX103AA09	AUTHO - CODE CORRECTION
F3932	NTX103AA09	DISA REMOVE AUTHCODE TIMEOUT
F3938	NTX407AB01	ACD DIRECTORY NUMBERS
F3940	NTX100AA20	INCREASE NUMBER OF EQUIVALENT DN APPEARANCE FOR IBN
F3945	NTX056AA04	OPTIONAL PARAMETER FOR DMOPRO TO SUPPRESS SUMMARY MESSAGE
F3947	NTX244AA02	SEQUENTIAL TRUNK SELECTION REALTIME IMPROVEMENTS
	NTX244AB01	
F3949	NTX146AA03	RLCM-LTC-SPCH PATH DIAG. ENHANCEMENT
F3950	NTX001AA21	LTC NETWORK LINKS DIAGNOSTIC
F3952	NTX001AA21	ENHANCED XPM/LCM ROBUSTNESS
F3956	NTX100AA20	IBN CALL PICK-UP ENHANCEMENTS
F3959	NTX165AA06	BOC - AMA CALL CODE 032
F3960	NTX001AA21	CC BOOT LOADER FIRMWARE ENHANCEMENT
F3962	NTX001AA21	CALL PROCESSING ROBUSTNESS
F3964	NTX001AA21	CLLI ENHANCEMENTS BCS APPL SPEEDUP

Feature Number	Feature Package	Feature Title
F3965	NTX001AA21	PERIPHERAL STATUS CHECK REPORT BEFORE SWACT
F3967	NTX901AA17	LM ENHANCEMENTS TO SUPPORT NET/PM SPEECH LINK DIAGNOSTICS
F3968	NTX208AA02	AUTOMATIC COIN TOLL SERVICE PHASE I
F3973	NTX250AA12	IBM3274 DATA UNIT
F3974	NTX250AA12	IBM3278 DATA UNIT
F3976	NTX398AA10	LINE INVENTORY FOR SLC96
F3977	NTX562AA02	KILLER TRUNK REPORT SEPARATION
F3978	NTX562AA02	AUTOMATIC TRUNK TESTING REPORT
F3981	NTX415AA04	ACD AGENT STATUS LAMP
F3982	NTX299AA02	SMS - MAINTENANCE AND TABLE CONTROL FOR NAILED-UP SPECIAL
	NTX299AB01	
F3983	NTX455AA01	EADAS/NM - ADMINISTRATION AND OPERATION
	NTX455AB01	
F3990	NTX250AA12	DU AUTOBAND
F3991	NTX426AA01	ASYNCHRONOUS LINE CARD
F3997	NTX041AA07	CCS7 ST COMMISSIONING LOAD
	NTX041AB04	
F3998	NTX041AA07	CCS7 - MSB COMMISSIONING LOAD
	NTX041AB04	
F4411	NTX106AA09	P_PHONE LINECARD
F4495	NTX066AA02	VARIABLE LANGUAGE BMMI
F5400	NTX001AA21	TRAP AND RESTART COUNTER MANAGEMENT
F5402	NTX055AA03	LOADFW COMMAND FOR DOWNLOADING MTCE TEST UNIT(MTU)
F5405	NTX270AA12	NPE - LM SPEECH LINK DIAGNOSTICS
F5407	NTX218AA03	EADAS - FLEXIBLE OM TRANSFER PERIOD
F5409	NTX136AA03	105 TESTLINE ERL/SRL
F5410	NTX901AA17	AUTOMATIC RETEST OF ALT FAILURES
F5411	NTX398AA10	SLC-96-CC PM MAINTENANCE
F5412	NTX398AA10	SLC-96-CC PROTECTION SWITCHING
F5413	NTX398AA10	SLC-96-CC LINES MTCE
F5414	NTX195AA05	LINE TEST DESK INTERFACE
F5415	NTX398AA10	SMS RINGING - FIRMWARE
F5416	NTX398AA10	SMS SUBSCRIBER LINE TEST - FIRMWARE
F5417	NTX398AA10	SMS MAINTENANCE - FIRMWARE
F5418	NTX398AA10	SMS MESSAGING MODE I,III, FIRMWARE
F5419	NTX398AA10	SMS A/B BOARD DIAGNOSTICS FIRMWARE
F5420	NTX398AA10	SMS DS-1 BOARD DIAGNOSTICS FIRMWARE
F5422	NTX208AA02	ACTS - STANDARD PROM ANNOUNCEMENTS
F5424	NTX186AA06	EA - EXPANDED TOLL DENIAL
F5425	NTX186AA06	EA - CC REAL TIME IMPROVEMENT
	NTX386AA03	
F5426	NTX020AC01	EA - CALL FORWARDING ENHANCEMENT
F5429	NTX054AA05	AUTO RETEST OF ALT FEATURES
F5431	NTX020AC01	EXPANDED SPEED CALL CAPABILITIES
F5432	NTX001AA21	TERMINAL TYPES EXTENSION
F5433	NTX147AB01	OPM CC MTCE SOFTWARE
F5435	NTX407AB01	ACD BASE UTILITIES
F5436	NTX001AA21	FILE SYSTEM DEVICES INCREASED

Feature Number	Feature Package	Feature Title
F5437	NTX059AB04	DATAPAC POLLING AND RESTRUCTURE
F5445	NTX100AA20	IBN FLASH TRANSLATOR
F5446	NTX269AA07	UTR - CALL PROCESSING FOR LINES
F5449	NTX001AA21	CPU CAPACITY ENHANCEMENT (40 MHZ CPU)
F5455	NTX213AB02	SCM100R - OM AND DTSR SUPPORT FOR SMR
F5456	NTX213AB02	SCM100R - SMR PM MAINTENANCE - PHASE II
F5458	NTX213AB02	SCM100R - SMR OVERLOAD CONTROL
F5461	NTX398AA10	SLC96 - DTSR FOR LINES ON A RCS
F5462	NTX398AA10	SLC96 - SMS ANI AND COIN FUNCTIONS
F5463	NTX398AA10	SLC96 - SMS P-SIDE CHANNEL MANAGEMENT
F5464	NTX398AA10	SLC96 - SMS PROTECTION SWITCHING
F5466	NTX398AA10	SLC96 - SMC MAINTENANCE - MODE II
F5467	NTX001AA21	SOFTWARE SECURITY - NT1X67 TERM CONTROLLER IMPROVEMENTS
F5474	NTX154AA03	RLCM-ESA - SINGLE PROCESSOR CONFIGURATION
F5489	NTX186AA06	EAE0 - 00 MINUS DIALING ROUTED VIA PIC
F5490	NTX186AA06	EAE0 - P2(PX) TRUNK COMPATIBILITY
F5491	NTX209AA03	FGB - AMA ENHANCEMENTS
F5497	NTX211AA02	
F5497	NTX270AA12	PM MAP ENHANCEMENTS
F5499	NTX040AA03	MSB6 NEW STI CARD SUPPORT
F5500	NTX001AA21	OM TRANSFER SPEEDUP
F5502	NTX415AA04	ACD CALL AGENT FEATURE
F5503	NTX250AA12	DATAPATH - CALL PROGRESS SIGNAL INDICATION
F5504	NTX165AA06	BELLCORE AMA CALL CODES 085 AND 011
F5506	NTX269AA07	ENHANCED MAINTENANCE FOR UTRS
F5508	NTX150AA03	RSC - INTRA SWITCHING OMS
F5509	NTX299AA02	SCM - SMS SPECIAL SERVICES
F5510	NTX299AB01	
F5510	NTX041AA07	CCS7 - SIGNALING TERMINAL
F5532	NTX041AB04	
F5532	NTX398AA10	SCM - BOARD TO BOARD SUPPORT FOR RCS
F5533	NTX213AB02	SCM - PP SMR WARM SWACT
F5534	NTX398AA10	SCM - PP SMS WARM SWACT
F5537	NTX269AA07	UTR - CALL PROCESSING FOR TRUNKS
F5547	NTX573AA01	IBN SECURITY CODE - 2500 ONLY
F5548	NTX574AA01	IBN SECURITY CODE -2500 AND BUSINESS SETS
F5549	NTX159AA06	RENAME ATT AMA TO BC AMA
F5550	NTX250AA12	RACK MOUNT DVS (LS AND HS)
F5551	NTX140AA02	CC SUPPORT FOR THE DUAQ MODEMS
F5552	NTX100AA20	OM - DIRECTED CALL PARK
F5553	NTX250AA12	LOW SPEED DU WITH ELASTOMER KEY PAD
F5554	NTX250AA12	HIGH SPEED DU WITH ELASTOMER KEY PAD
F5563	NTX195AA05	INCOMING TEST TRUNK (2X90AD) ENHANCEMENTS(CC)
F5566	NTX186AA06	CORRIDOR 611 ROUTING AND BILLING
F5572	NTX186AA06	EAE0 - IC/INC EVENT STATUS ENHANCEMENT
F5577	NTX001AA21	IMPROVED AMA TIMING COMPENSATION
F5579	NTX156AA02	RLCM INTRASWITCHING
F5585	NTX259AA03	DATAPATH EXTENSION UNIT DPX

Feature Number	Feature Package	Feature Title
F5588	NTX416AB02 NTX416AC01	AGENT COMMUNICATION KEY
F5589	NTX416AB02 NTX416AC01	ACD EXTENDED AGENT OBSERVE
F5590	NTX416AB02 NTX416AC01	ACD QUEUE STATUS LAMPS
F5600	NTX415AA04	DISPLAY QUEUE STATUS KEY
F5601	NTX416AB02 NTX416AC01	ACD SUPERVISOR CONTROL OF NIGHT SERVICE
F5614	NTX415AA04	AGENT STATUS LAMPS
F5617	NTX165AA06	CUSTOMER DIALED ACCOUNT RECORDING
F5628	NTX100AA20	TRUNK BUSY VERIFY TONE
F5632	NTX101AA13	A/C DISPLAY OF QUEUE CALLS BY PRECEDENCE
F5633	NTX101AA13	A/C ANSWER TIME BY PRECEDENCE
F5634	NTX412CA03	PARTITIONED TABLE EDITOR
F5635	NTX100AA20	IBN FEATURE ACTIVATION OMS I
F5652	NTX001AA21	RETENTION TEST OF ALLOCATED MEMORY
F5655	NTX001AA21	ENABLE GAINS ON CLSI NETWORK
F5659	NTX001AA21	PM EXEC TABLE CONTROL RESTRICTIONS
F5667	NTX041AA07 NTX041AB04	CCS7 LINK SET MGMT
F5668	NTX041AA07 NTX041AB04	CCS7 ROUTE SET MGMT
F5670	NTX167AB04	CCS7 INDN USER PART
F5674	NTX554AA01	E800
F5676	NTX001AA21	FIXED TRUNK GROUP NUMBERING NOT OPTIONAL
F5677	NTX186AA06	EA: OPTIONAL/SAC CODES
F5683	NTX186AA06	CIRCLE DIGIT EQUAL ACCESS COMPATIBILITY
F5684	NTX098AA03 NTX159AA06	BC AMA INTERLATER WATS CALL CODE III
F5693	NTX250AA12	INTEGRATED BIT ERROR RATE TESTING (IBERT)
F5698	NTX001AA21	PATCH DOWNLOADING
F5699	NTX001AA21	QUERY COMMAND ENHANCEMENTS
F5701	NTX001AA21	ROBUSTIFICATION OF LM/RLM MAINTENANCE
F5702	NTX001AA21	ROBUSTIFICATION OF CARRIER MAINTENANCE
F5704	NTX001AA21	ROBUSTIFICATION OF NETWORK MAINTENANCE
F5710	NTX000AA13	GENERALIZED MAP CAPABILITY
F5710	NTX560AA03 NTX560AB02	GENERALIZED MAP CAPABILITY
F5711	NTX427AA04	NMP CUSTOMER SCREENING
F5716	NTX001AA21	TRK RTS SPEED-UP PHASE I
F5718	NTX106AA09	ENHANCED SERVORD FOR BUSINESS SET
F5722	NTX001AA21	NO-CALL - PROCESSING ALARM
F5726	NTX269AA07	RADR FOR UTR
F5727	NTX269AA07	XPM DTMF FOR TRUNKS WITH UTR
F5734	NTX270AA12	XPM REALTIME ENHANCEMENTS
F5735	NTX001AA21	LCM OVERLOAD CONTROL
F5742	NTX209AA03	FGB-AMA ENHANCEMENTS II

Feature Number	Feature Package	Feature Title
F5743	NTX268AA02	
F5745	NTX140AA02	1200 BAUD DIAL-UP AUTOQUOTE
F5747	NTX059AB04	XFER SIMULTANEOUS POLLING
F5751	NTX901AA17	COIN DISPOSAL SIGNAL POLARITY OPTION
F5752	NTX901AA17	EXEC STORE EXPANSION
F5753	NTX001AA21	RLM SIGNAL PROCESSING STORE SAVING
F5754	NTX901AA17	LM - SUPPORTED COIN FUNCTIONS FOR SLC-96
F5755	NTX259AA03	DPX MAINTENANCE
F5756	NTX001AA21	AMA PRESERVATION OVER PERIPHERAL WARM SWACT
F5757	NTX056AA04	JOURNAL FILE OPTION WITH DMO PRO
F5758	NTX213AB02	LTA ON RCTS (CC)
F5759	NTX060AB10	NETWORK MANAGEMENT SHORT SLLI SIMPLIFICATION
F5760	NTX218AA03	EADAS DATAFILL SEQUENCE SIMPLIFICATION
F5765	NTX273AA07	MPC LOGS FOR IOD MAINTENANCE
F5766	NTX901AA17	IMMEDIATE ANSWER REPORTING
F5767	NTX001AA21	ENHANCED DIRP FILE
F5768	NTX145AA05	RSC TRUNK WARM SWACT
F5769	NTX149AA02	ESA - PREFIX TRANSLATION TABLE CONTROL
	NTX149AB02	
F5771	NTX149AA02	RSC-ESA - STATIC DATA HANDLING IN XPM
	NTX149AB02	
F5771	NTX041AA07	SCCP
	NTX041AB04	
F5785	NTX415AA04	DOCUMENTATION OF MINOR ENHANCEMENTS
F5786	NTX041AA07	MTP - CONGESTION/TIMER OPTION TABLE CONTROL
	NTX041AB04	
F5787	NTX550AA02	TCAP
F5791	NTX041AA07	CCS7 BASE
	NTX041AB04	
F5792	NTX041AA07	MTP ROBUSTNESS IMPROVEMENT
	NTX041AB04	
F5813	NTX270AA12	XPM ROUTINE EXERCISE TEST
F5830	NTX054AA05	RTP ROBUSTNESS
F5833	NTX270AA12	XPM ROM DIAGNOSTIC MMI
F5835	NTX000AA13	MAP LEVEL FOR NOP
F5837	NTX101AA13	GENERAL DISTINCTIVE RINGING
F5839	NTX167AB04	ISUP TTP ENHANCEMENTS
F5840	NTX167AB04	ISUP GROUP MESSAGE HANDLING
F5841	NTX167AB04	ISUP TOLL SIGNALLING
F5842	NTX167AB04	INTERWORKING - ISUP TO TOPS
F5843	NTX167AB04	ISUP TANDEM CALL
F5844	NTX167AB04	ISUP TEST LINES TL100,TL102
F5848	NTX416AB02	ACD SYSTEM INTEGRITY
	NTX416AC01	
F5861	NTX416AB02	ACD REAL TIME STATUS DISPLAY
	NTX416AC01	
F5862	NTX415AA04	ACD SHOW
F5864	NTX415AA04	ACD HEADSET

Feature Number	Feature Package	Feature Title
F5870	NTX001AA21	CPU DIAGNOSTIC IMPROVEMENTS
F5871	NTX001AA21	MATCH COMMAND IMPROVEMENT
F5872	NTX001AA21	OUTAGE FOOTPRINT FACILITY
F5873	NTX001AA21	BABBLING IDIOT ENHANCEMENTS
F5878	NTX563AA03	SERVORD INTERFACE FOR NOS
F5886	NTX416AB02	ACD OVERFLOW ENHANCEMENT
	NTX416AC01	
F5890	NTX101AA13	ATTENDANT TO UCD
F5894	NTX149AB02	RSC - TRUNK INTEGRATION
F5897	NTX100AA20	AC EXTENDED CALLS TO CFB/CFD
F5901	NTX007AB02	HUNT GROUP ENHANCEMENT
F5904	NTX270AA12	XPM DIAG DRIVER ENHANCEMENTS
F5907	NTX001AA21	LCM DRAWER MAINTENANCE
F5915	NTX156AA02	RLCM INTRASWITCHED END TO END SIGNALLING
F5916	NTX001AA21	SPEEDUP C1 DIRECTORIES
F5918	NTX901AA17	LM - TAKEOVER/TAKEBACK ENHANCEMENT
F5919	NTX154AA03	ESA EXIT SUPPORT FOR RLCM
F5920	NTX154AA03	ENHANCED CC MAINTENANCE SUPPORT FOR RLCM
F5924	NTX001AA21	IMPROVE SWITCH ROBUSTNESS AGAINST RAM ERRORS
F5926	NTX060AB10	NETWORK MGMT TRUNK GROUP DATA REORGANIZATION
F5927	NTX218AA03	EADAS DATA FORMAT ROBUSTNESS
F5928	NTX001AA21	TRUNK RTS SPEED-UP - PHASE II
F5931	NTX001AA21	BABBLING LINE HANDLER
F5935	NTX001AA21	TRUNK SUPERVISION OVER DTC SWACT
F5936	NTX001AA21	ENHANCED LCM OVERLOAD CONTROLS
F5937	NTX060AB10	NETWORK MGMT TRUNK GROUP CONTROL INTERFACE REORG
F5938	NTX150AA03	RSC INTRASWITCHED END TO END SIGNALLING
F5948	NTX398AA10	ALARM ENHANCEMENTS FOR SMS
F5949	NTX398AA10	SMS PROTECTION SWITCH ROBUSTNESS PHASE I
F5953	NTX001AA21	PM AUTOLOADING PHASE I
F5955	NTX812AA03	DMS PASSTHROUGH MAP APPLICATION ENTITY
F5956	NTX560AA03	CC GENERAL PURPOSE RO IMPLEMENTATION
	NTX560AB02	
F5957	NTX407AB01	3WC/CALL TRANSFER TO ACD
F5963	NTX407AB01	INCOMING CALL PRIORITY
F5964	NTX407AB01	INCOMING CALL QUEUE
F5965	NTX407AB01	CALL DELAY ANNOUNCEMENT
F5966	NTX407AB01	NIGHT TREATMENT
F5967	NTX407AB01	AUTOMATIC OVERFLOW
F5968	NTX407AB01	INCOMING CALL QUEUE
F5969	NTX407AB01	AGENT QUEUE
F5970	NTX407AB01	ABANDONED CALL CLEARING
F5972	NTX724AA02	TOPS V OPERATOR POSITION I/F
F5973	NTX724AA02	TOPS V I/F - INCHARGE ASST. FORCE MGMT. POSITIONS
F5974	NTXA90AA01	TERMINAL HANDLING S/W FOR TOPS MP
	NTX731AA03	
F5975	NTX030CC10	TOPS OPERATIONAL MEASUREMENTS ENHANCEMENTS
F5976	NTXA90AA01	TPC DIAGNOSTICS

Feature Number	Feature Package	Feature Title
F5977	NTX731AA03 NTXA90AA01	TPC DRIVERS
F5978	NTX731AA03 NTXA90AA01	TPC TUTOR I/F
F5979	NTX731AA03 NTXA90AA01	TPC DEBUG TERMINAL HANDLE
F5980	NTX731AA03 NTXA90AA01	TPC SYSTEM SUPPORT
F5981	NTX731AA03 NTXA90AA01	TPC ADMINISTRATION
F5989	NTX048AA04	SYNC CLOCK MAINTENANCE
F5990	NTX710AA02	INCOMING TRUNK CALL PROCESSING
F5991	NTX710AA02	TRANSLATION AND ROUTING
F5992	NTX710AA02	SIGNALLING CONVERSION
F5993	NTX710AA02	ORIGINATING BILLING
F5994	NTX710AA02	DATABASE SYSTEM ENHANCEMENTS
F5995	NTX710AA02	DATABASE REPORTING
F6014	NTX387AA04	SMU CC MMI
F6015	NTX387AA04	SMU BASIC RTS
F6016	NTX387AA04	SMU CALL PROCESSING MODE AND LINE MNTCE
F6017	NTX387AA04	SMU MAINTENANCE AND OMS
F6018	NTX387AA04	SMU ALARMS/CHANNEL REASSIGNMENT
F6020	NTX387AA04	SMU OAM ENHANCEMENT
F6024	NTX251AA05	MODEM POOL TESTING
F6027	NTX060BA02	REDUCED SILC GAPPIC INTERVAL
F6028	NTX060BB01 NTX455AB01	30 SECOND DISCRETS ENHANCEMENT
F6029	NTX060AB10	CANCEL AND SKIP CONTROLS
F6030	NTX398AA10	LINE DIAGNOSTIC ENHANCEMENTS FOR SMS
F6042	NTX149AB02	RSC ESA TRUNK TRANSLATION
F6043	NTX167AB04	ISUP CONTINUITY TEST
F6044	NTX167AB04	LOOP AROUND TRUNK FOR ISUP TO POTS LINE
F6046	NTX167AB04	ISUP SUPERVISION ENHANCEMENT
F6049	NTX215AA02	SES VOICE LINK MAINTENANCE
F6050	NTX215AA02	SES VOICE LINK BRIDGING AND RELEASE-CALL PROCESSING
F6051	NTX215AA02	TABLE CONTROL FOR SES SYSTEM TABLE SES DATA
F6053	NTX215AA02	SES TRAFFIC DATA COLLECTION
F6054	NTX215AA02	DLSE CALL CLASSIFICATION AND SELTION
F6055	NTX215AA02	ITSE CALL CLASSIFICATION AND SELECTION
F6056	NTX215AA02	SES CALL DETAILS
F6057	NTX215AA02	SEI SUPERVISOR
F6058	NTX060BA02 NTX060BB01	SILC DATABASE ROBUSTNESS
F6059	NTX060BB01	FLEXIBLE REROUTE (FRR)-MMT,OM AND DB
F6061	NTX273AA07	MPC DATAPAC X.25 PP S/W
F6062	NTX560AA03 NTX560AB02	OPTIONAL USE OF MPC BY NOS RO SERVICE

Feature Number	Feature Package	Feature Title
F6063	NTX001AA21	DIRP DISK ERASE FILE SECURITY ENHANCEMENT
F6076	NTX250AA12	DATAPATH MCD DATA TRANSMISSION DELAY
F6079	NTX250AA12	RACK MOUNT DU EIA CONTROLLED LP BACK
F6080	NTX250AA12	FEATURE ENHANCED HIGH SPEED DU(AP) FIRMWARE VERSION 4
F6084	NTX001AA21	INCREASE THE NUMBER OF IO NODE TYPES
F6085	NTX001AA21	LOG SYSTEM INTERNAL CONTROL CLEANUP
F6089	NTX001AA21	ALARMING ON DCM/RLM LINKS
F6090	NTX145AA05	RCC CSIDE LINK DIAGNOSTIC
F6091	NTX291AA04	ENHANCED ACTIVITY
F6092	NTX001AA21	DIRP PROCESS REVIVAL
F6093	NTX001AA21	DIRP REALTIME ENHANCEMENTS
F6098	NTX813AA01	CENTRALIZED ALARMS
F6113	NTX750AB04	ISDN IAC SWACT FOR TRANSPORT SERVICES
F6114	NTX750AB04	ISDN D CHANNEL HANDLER ROBUSTNESS
F6128	NTX750AB04	IDENTIFICATION OF ISDN ISLC-1B IN DMS ARCHITECTURE
F6129	NTX750AB04	ISDN LINE MAINTENANCE
F6144	NTX750AB04	BEARER CAPABILITY FOR ISDN
F6145	NTX750AB04	ISDN CALL PROCESS INDICATION
F6146	NTX750AB04	SERVICE ORDERS FOR FOR ISDN TERMINALS
F6147	NTX750AB04	ISDN MULTIPLE TERMINALS CALL PROCESSING
F6148	NTX750AB04	ISDN TERMINAL TEST AND CONFIGURATION
F6149	NTX750AB04	CC SOFTWARE FOR XPM SPECIAL CONNECTIONS
F6150	NTX750AB04	MULTIPLE TERMINALS FOR ISDN LOOP
F6151	NTX250AA12	BASIC BERT
F6153	NTX001AA21	NODE TYPE EXTENSION FOR NEW PERIPHERALS
F6154	NTX001AA21	PM AUTOLOADING - PHASE II
F6155	NTX001AA21	LCM DRAWER MAINTENANCE - PHASE II
F6156	NTX001AA21	TRUNK SUPERVISION OVER DTC SWACT
F6158	NTX001AA21	TRUNK IDLE PRIMITIVE FOR DTCEX LINEUP
F6159	NTX001AA21	TABLE FOR DUMP/RESTORE OF LOGIN CONTROL DATA
F6162	NTX270AA12	DTSR CAPACITY ENHANCEMENTS
F6163	NTX824AA01	IBN CANCEL CALL WAITING
F6164	NTX824AB01	
F6164	NTX030CC10	TOPS REALTIME ENHANCEMENTS
F6166	NTX030CC10	TOPS OM ENHANCEMENTS - PHASE II
F6167	NTX416AB02	DIFFERENTIATE ENH ACD SHOW FROM BASIC ACD SHOW - ENH I
F6167	NTX416AC01	
F6168	NTX827AA02	XPM REALTIME AND PERFORMANCE TOOLS
F6169	NTX387AA04	SMU AUTOMATIC BOARD-TO-BOARD TEST
F6170	NTX297AA01	MULTI_PARTY BRIDGING
F6171	NTX387AA04	SMU IBN
F6172	NTX387AA04	SHARED METALLIC TEST ACCESS
F6173	NTX387AA04	RCU CARRIER MAINTENANCE ENHANCEMENTS
F6175	NTX730AA02	MULTILINK ASCII DEVICE DRIVER
F6176	NTX250AA12	DATAPATH MTA
F6189	NTX001AA21	PREFCT TOOL
F6190	NTX270AA12	DTSR REALTIME ENHANCEMENTS
F6191	NTX000AA13	OPTIMIZE MTCCLASS TASKS

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Feature Number	Feature Package	Feature Title
F6207	NTX727AA02 NTX727AC01 NTX727AD01	ACD LOAD MANAGEMENT BASIC COMMANDS
F6208	NTX416AB02 NTX416AC01	ACD REAL TIME DISPLAY ENHANCEMENT
F6211	NTX101AA13	VCD QUEUE STATUS LAMPS ATTENDANT FEATURES
F6212	NTX041AA07 NTX041AB04	SCCP-AUDITS AND ENHANCEMENTS
F6214	NTX041AA07 NTX041AB04	CCS7 BCS INSERTION
F6217	NTX387AA04	SMU WARM SWACT (PP)
F6219	NTX001AA21	DEFERRED OM OUTPUT
F6221	NTX387AA04	SMU COIN CAPABILITY
F6222	NTX812AA03	CENTRALIZED MAP DMS ENHANCEMENTS
F6224	NTX416AB02 NTX416AC01	ACD AGENT AND SUPERVISOR POSITION ID MEMBERS
F6233	NTX001AA21	ECCB IMPROVEMENTS
F6234	NTX563AA03	UPHEAD OF CUSTOMER LINE DATA TO DNC
F6235	NTX562AA02	CONVERSION OF NOS FILE TRANSFER TO GENERIC RO SERVICE
F6236	NTX560AA03 NTX560AB02	GENERIC RO SERVICE ENHANCEMENTS
F6237	NTX001AA21	DEVICE INDEPENDENT SUPPORT FOR APPLICATION DATA TRANSFER
F6238	NTX048BA02	STRATUM - 3 CLOCK SYNCHONIZATION
F6240	NTX941AA05	6M MEMORY MAINTENANCE
F6241	NTX041AA07 NTX041AB04	MTP - CONGESTION/TIMER
F6244	NTX186AA06	OMS - PIC AND NON PIC CALLS PER IC/INC
F6246	NTX243AA07	DPP ROBUSTNESS ENHANCEMENTS
F6248	NTX060AB10	ENHANCED CODE CONTROLS
F6249	NTX455AB01	TRUNK GROUP CONTROL IDENTIFIERS
F6250	NTX060AB10	DETECTION ENHANCEMENTS OF MACHINE CONGESTION CONDITION
F6251	NTX387AA04	SMU LINE MTCE - COIN, FXB (PP)
F6252	NTX387AA04	SMU FORWARD DISCONNECT(PP)
F6253	NTX387AA04	SMU EXPANDED RCU CONNECTIONS(PP)
F6254	NTX621AA02	SMU FXB HAIRPIN SPECIAL SERVICES
F6255	NTX621AA02	SSM HAIRPIN
F6256	NTX621AA02	DE4 DPX HAIRPIN TO DTC
F6257	NTX621AA02	INTEGRATED LOCAL SPECIALS
F6263	NTX710AA02	DNPIC BULK DMO TOOL
F6264	NTX710AA02	SUPER CAMA TRAVER HANDLING
F6267	NTX041AA07 NTX041AB04	MTP - DISTRIBUTED DATA MGMT
F6268	NTX041AA07 NTX041AB04	MTP - DISTRIBUTED LINK/ROUTE STATUS CHANGES
F6269	NTX041AB04	MULTI(4) - MSB7 CAPABILITY
F6271	NTX167AB04	ISUP - FPE ENHANCEMENT TO HANDLE ISUP
F6272	NTX167AB04	ISUP TESTLINE ENHANCEMENTS
F6273	NTX167AB04	ISUP/POTS LINES INTERWORKING

Feature Number	Feature Package	Feature Title
F6275	NTX717AB01	TRUNK VERIFICATION FROM DESIGNATED STATION II
F6276	NTX727AA02	ACD LOAD MANAGEMENT - ENHANCED COMMANDS
	NTX727AD01	
F6284	NTX269AA07	UTR BASE ENHANCEMENTS
F6285	NTX150AA03	RCC LINE INTRASWITCHING PADS
F6287	NTX381AA01	RLCM OFF RCC
F6299	NTX270AA12	ENHANCED DS-1 INTERFACE MAINTENANCE
F6301	NTX041AA07	SCCP - FOR DMS SCP
	NTX041AB04	
F6303	NTX149AA02	RLCM/RCE ESA CHANNEL CAPACITY INCREASE
	NTX149AB02	
	NTX154AA03	
F6304	NTX387AA04	PROGRAMMABLE SPARE ALARMS FOR RCU
F6309	NTX053AA05	KILLER TRUNK REPORTING
F6310	NTX738AA03	SPMS - CUSTOMER CONFIGURATION
F6311	NTX001AA21	OM OUTPUT ROBUSTNESS
F6312	NTX001AA21	OMPRT OUTPUT BUFFERING
F6314	NTX259AA03	DATAPATH D4 DPX FIRMWARE
F6315	NTX259AA03	DATAPATH D4 DPX MAINTENANCE ENHANCEMENT
F6316	NTX455AB01	EADAS/NM COMMAND INTERFACE
F6317	NTX455AB01	EADAS/NM AUDIT INTERFACE
F6318	NTX455AB01	EADAS/NM 5-MINUTE PACKET INTERFACE
F6319	NTX560AB02	X.25 PACKAGING ENHANCEMENTS FOR NOP
F6323	NTX250AA12	PROFILE ENHANCEMENT
F6325	NTX251AA05	RESOURCE SELECTOR OVERRIDE
F6327	NTX250AA12	LOCAL BUSY OUT
F6333	NTX195AA05	SCM LINE MONITOR ACCESS
F6334	NTX108AA05	CALL FORWARD REASON DISPLAY
F6344	NTX149AB02	RSC - ESA TRANSLATION VERIFICATION DOCUMENTATION
F6346	NTX455AB01	CHANGED TRUNK GROUP RECORDING ABILITY
F6347	NTX060AB10	PREFIX CODES CONTROL
F6351	NTX001AA21	CC SUPPORT FOR DTU
F6352	NTX881AB02	DTU BERT
	NTX881AC02	
	NTX882AA03	
F6354	NTX001AA21	DTU F/W DOWNLOADER
F6355	NTX881AA01	SWITCH BER INDICATOR
	NTX881AB02	
	NTX881AC02	
F6356	NTX885AA02	INTEGRITY CHECK TRAFFIC SIMULATOR(ICTS)
	NTX885AB01	
F6357	NTX885AA02	XPM PERIPHERAL BIT ERROR TESTING
	NTX885AB01	
F6359	NTX142AA01	CLEAR CHANNEL 64 KB/S SIGNALLING
F6360	NTX750AB04	ISLM ENHANCEMENT
F6370	NTX750AB04	ISDN ST MAINTENANCE
F6373	NTX750AB04	NEW LTP LEVEL FOR DATA LINES
F6379	NTX753AA02	ENHANCED XPM CALL PROCESSING FOR FUNCTIONAL SIGNALLING

Feature Number	Feature Package	Feature Title
F6381	NTX750AB04	IAC WARM SWACT FOR ISDN CALL PROCESING
F6382	NTX753AA02	ISDN BRA FUNCTIONAL SIGNALLING : CALL PROCESSING I
F6383	NTX753AA02	ISDN BRA FUNCTIONAL SIGNALLING FEATURE ACCESS UTILITY
F6384	NTX753AA02	MULTIPLE FUNCTIONAL SIGNALLING CALLS PER DIRECTORY NUMBER
F6385	NTX750AB04	INCREASE MAXIMUM NUMBER FOR ISDN TERMINAL PROFILES
F6386	NTX753AA02	ENHANCED CALL PROCESSING FOR FUNCTIONAL SIGNALLING
F6388	NTX753AA02	FUNCTIONAL SIGNALLING ACCESS TO MDC FEATURES
F6389	NTX750AB04	TABLE CONTROL FOR ISDN BRA FUNCTIONAL SIGNALLING
F6395	NTX790AA03	ISDN PRA MAINTENANCE - B, D CHANNEL
F6396	NTX790AA03	TABLE CONTROL - PRA TRUNKS
F6397	NTX790AA03	INTEGRATED SERVICES ACCESS/CALLING NUMBER DELIVERY
F6398	NTX790AA03	FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT
F6399	NTX790AA03	FUNCTIONAL SIGNALLING - CONNECTION MANAGEMENT
F6400	NTX270AA12	AUDIBLE ALARMS FOR REMOTE CSIDE LINK FAILURES
F6402	NTX001AA21	HIGH WATER MARK OMS FOR CP,EXT,FTRQ
F6403	NTX270AA12	XPM RTS ENHANCEMENTS
F6404	NTX299AA02	DID PBX VIA HAIRPIN
	NTX299AB01	
F6405	NTX299AA02	DDS HAIRPIN
	NTX299AB01	
F6406	NTX387AA04	RCV OFFICE PARAMETER
F6407	NTX398AA10	MERIDIAN DIGITAL CENTREX ON SMS
F6412	NTX812AA03	DYNAMIC ALLOCATION OF CENTRALIZED MAP SESSIONS
F6413	NTX001AA21	IMAGE TEST ENHANCEMENTS
F6414	NTX167AB04	ISUP 105 TESTLINE
F6415	NTX167AB04	ISUP MDC INTERWORKING
F6416	NTX825AA02	ACCS ENHANCEMENTS
F6417	NTX001AA21	DMS SCHEDULER CLASS FOR NOS FILE TRANSFER
F6426	NTX727AC01	ACD CONFIGURATION SECURITY
	NTX727AD01	
F6430	NTX727AD01	ACD CONFIGURATION SECURITY ENHANCEMENT
F6431	NTX991AA01	ACD MANAGEMENT INFORMATION SYSTEM INTERFACE
	NTX991AB02	
F6432	NTX100AA20	AUDIO TABLE EXPANSION
F6438	NTX992AA01	ACD MIS DOWN STREAM PROCESSOR
F6442	NTX270AA12	DECOUPLE CC RELOAD RESTART FROM XPM RESTART
F6443	NTX738AA03	SPMS ENHANCEMENT
F6444	NTX827AA02	XPM PERFORM TOOL ROBUSTNESS
F6445	NTX991AA01	DMS USER INTERFACE TO ACD MIS
	NTX991AB02	
F6448	NTX881AB02	SWITCH BER INDICATOR FOR TRUNKS
	NTX881AC02	
	NTX882AA03	
F6449	NTX901AA17	6X17AD LINE CARD MTCE SUPPORT
F6456	NTX942AA04	ENHANCED CORE SYSTEM LOAD UNIT
F6457	NTX041AA07	SCCP - MMI EVOLUTION FOR STP
	NTX041AB04	
F6458	NTX167AB04	ISDN-UP ACCESS TO CONSOLE VIA LOOPBACK TRUNK

Feature Number	Feature Package	Feature Title
F6459	NTX167AB04	ISDN-UP MDC FEATURE VIA LOOP-AROUND TRUNKS
F6466	NTX380AA02	INTERLINK MAINTENANCE
F6467	NTX380AA02	CC INTERSWITCHING
F6468	NTX380AA02	DUAL RCC - INTERLINK MESSAGING
F6469	NTX380AA02	DUAL RCC - PP LINE INTERSWITCH
F6470	NTX380AA02	ESA CALL CONTROL
F6472	NTX380AA02	DUAL RCC - PERIPHERAL LINE INTERSWITCH ENHANCEMENTS
F6473	NTX380AA02	DUAL RCC - INTERSWITCH OPERATIONAL MEASUREMENTS
F6474	NTX380AA02	PERIPHERAL TRUNK INTERSWITCH
F6477	NTX182AA04	BCS22 COMMISSIONING NONRES S/W UPDATES
F6479	NTX001AA21	OUTAGE FOOTPRINT - PHASE II
F6482	NTX940AA06	MS MAP MMI AND LOGS ENHANCEMENTS
F6484	NTX048AA04	MASTER CLOCK SYNCHRONIZATION FOR E_CORE
F6485	NTX940AA06	ENHANCED 9X12 DIAGNOSTICS
F6492	NTX407AB01	3WC TO CHAINING TO ACD INTERACTION
F6493	NTX407AB01	ACD AGENT LOGIN ENHANCEMENT
F6499	NTX184AA09	DUMP AND RESTORE ROBUSTNESS
F6501	NTX901AA17	LTP CIBINCOM REWRITE
F6504	NTX184AA09	ENHANCED TCALLCT FOR POSSIBLE FIELD USE
F6505	NTX270AA12	NT6X50AB - MAP SUPPORT
F6506	NTX270AA12	CC SUPPORT FOR NT6X50AA
F6507	NTX143AA01	ESF USING NTX6X50AB
F6508	NTXA90AA01	ENHANCED MAINTENANCE FOR TPC RACKMOUNT
	NTX731AA03	
F6511	NTX184AA09	OLD TABLE CONTROL ENHANCEMENTS
F6514	NTX991AB02	ACD MIS PROTOCOL SPECIFICATION
F6515	NTX991AB02	DSP NOTIFICATION OF LOAD MANAGEMENT
F6516	NTXA52AB01	REMOTE ACD SHOW
F6517	NTXA52AA01	REMOTE ACD LOAD MANAGEMENT
	NTXA52AB01	
F6519	NTX737AB01	FLEXIBLE AMA EXPANSION
F6521	NTX219AB03	TEEN SERVICE - SELECTIVE CFW
F6522	NTX100AA20	STAT100 FEATURES IBN EXPANDED SPEED CALL LISTS
F6528	NTX001AA21	DIALED LOOPBACK ON TRUNK
F6529	NTXA40AA02	DN NETWORK ATTRIBUTES
F6530	NTXA63AA01	TOPS MP STANDARD DA INTERCEPT MESSAGING
F6531	NTXA62AA01	TOPS MP INTERNAL/EXTERNAL ARU MESSAGE ROUTING
F6532	NTX750AB04	BERT FOR ISDN BASIC ACCESS LOOPS
F6534	NTXA64AA03	RESIDENTIAL ENHANCED SERVICES (RES)
F6535	NTXA64AA03	RES FEATURE TRANSPARENCY
F6536	NTXA64AA03	RES DIGIT COLLECTION ARRANGEMENTS
F6538	NTX416AB02	ACD EMERGENCY KEY - ENHANCED
	NTX416AC01	
F6540	NTX790AA03	TABLE CONTROL - ISA ROUTING
F6543	NTX790AA03	ISA/CN DELIVERY ENHANCEMENTS
F6544	NTX790AA03	FUNCTIONAL SIGNALLING - INTERACTIONS
F6545	NTX790AA03	ISDN PRA MAINTENANCE - INTERACTION
F6546	NTX790AA03	TABLE CONTROL - LTCALLS

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F6547	NTX790AA03	TABLE CONTROL - XPM/CC CONNECTION
F6548	NTX790AA03	FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT ENHANCEMENTS
F6549	NTX790AA03	PRA/CCS7 INTERWORKING
F6550	NTX791AA02	NETWORK RING AGAIN - XPM SUPPORT
F6552	NTX790AA03	ISDN PRA MAINTENANCE - TEST LINES
F6558	NTX790AA03	XPM WARM SWACT
F6560	NTX883AA01	BERT FOR TRUNKS
F6564	NTX001AA21	FIXED TRUNK GROUP NUMBERING-SMDR
F6565	NTXA35AA03	NETWORK NUMBER DISPLAY
F6567	NTXA36AA01	NETWORK WIDE RING AGAIN
F6569	NTX380AA02	DUAL RCC - INTERLINK TABLE CONTROL AND STATIC DATA
F6570	NTX750AB04	ISDN LCM CC MAINTENANCE III
F6571	NTX145AA05	RCC C-SIDE NON CONSECUTIVE LINKS
F6572	NTX750AB04	SERVICE PARAMETERS
F6573	NTX387AA04	AUTOMATIC SYSTEM TEST FOR RCU
F6574	NTX380AA02	DUAL RCC - ESA SYNCHRONIZATION
F6575	NTX380AA02	CC ESA STATIC DATA
F6576	NTX380AA02	DUAL RCC - PP ESA MAINTENANCE
F6577	NTX380AA02	DUAL RCC - PP ESA MAINTENANCE ENTRY/EXIT
F6578	NTX380AA02	ESA CALL CONTROL II
F6579	NTX380AA02	DUAL RCC - WARM SWACT(PP)
F6580	NTX380AA02	DUAL RCC - ESA POTS INTERCALLING
F6581	NTX380AA02	DUAL RCC-ESA TRUNKING
F6582	NTX380AA02	DUAL RCC-ESA OMS(CC)
F6583	NTX380AA02	DUAL RCC-ESA OMS(PP)
F6585	NTX299AB01	INTEGRATED LOCAL SPECIALS/SPOTS
F6586	NTX108AA05	M5209/M5312 DISPLAY SETS
F6587	NTX103BA02	STATION SPECIFIC AUTHCODE - CDC ENHANCEMENT
F6595	NTXA39AA01	CALLING NUMBER AND NCOS DISPLAY ON ATTENDANT
F6596	NTXA69AA01	SPECIAL/NAILED UP CONNECTIONS
F6598	NTX901AA17	AUTOMATIC LINE TESTING REWRITE
F6599	NTX881AB02	IBERT RESOURCE MANAGEMENT
	NTX881AC02	
	NTX882AA03	
F6600	NTX790AA03	PRA INTERWORKING WITH SL-100 AGENCIES I
F6601	NTX270AA12	XPM SYNC DIAGNOSTIC
F6602	NTX001AA21	DYNAMIC PM RECONFIGURATION
F6603	NTX270AA12	BETTER CC INTERPRETATION OF MESSAGING FAILURES
F6610	NTX833AA03	TPS(3.5) WITH TASKED MESSAGE HANDLING
F6612	NTX833AA03	STP - LIM RATE ADAPTER DIAGNOSTICS
F6613	NTX833AA03	STP - LIM CLOCK DIAGNOSTIC
F6615	NTX056AA04	DATA DISTRIBUTOR
F6617	NTX941AA05	6 MEG MEMORY
F6626	NTX182AA04	BCS24 COMMISSIONING NONRES S/W UPDATES
F6627	NTX001AA21	LMD OM GROUP OPTIMIZATION
F6628	NTX001AA21	LCM O/G MESSAGE FLOW CONTROL
F6629	NTX750AB04	ISDN BRA OPTICAL LINE CARD MTCE
F6630	NTX106AA09	M518 SUPPORT AND INTRODUCTION

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F6632	NTX750AB04	ISDN LCM CALL PROCESSING
F6633	NTX380AA02	DUAL RCC-ESA MDC TRANSLATIONS
F6634	NTX380AA02	DUAL RCC - ESA MAINTENANCE
F6635	NTX833AA03	LIV7 DIAGNOSTICS
F6637	NTX833AA03	LIV TO LIV PROTOCOL
F6638	NTX100AA20	EXPANDED MERIDIAN DIGITAL CENTREX CAPACITY
F6640	NTX833AA03	LIM OM AND LOGS
F6641	NTX833AA03	LIM RATE ADAPTER ENHANCEMENTS
F6642	NTX833AA03	FTS ROBUSTNESS AND FAULTS
F6644	NTX833AA03	9X74 FIRMWARE
F6645	NTX833AA03	LIM CLOCK DIAGNOSTICS
F6646	NTX100AA20	IBN - CALL FORWARD GROUP DO-NOT ANSWER(CFGDA) FOR IBN HUNTING
F6647	NTX750AB04	DCH ENHANCEMENTS FOR ISDN FUNCTIONAL SIGNALLING
F6648	NTX750AB04	LOOP MAINTENANCE FOR ISDN LINE CARD NTB25AB
F6649	NTX750AB04	ISDN LCM LINE MAINTENANCE SUPPORT
F6650	NTX750AB04	ISDN LCM SOFTWARE
F6651	NTX750AB04	ISDN LCM BASE DEVELOPMENT
F6652	NTX167AB04	LOOPBACK REDUCTION FOR ISUP/AC
F6653	NTX167AB04	ISUP PBX TRUNK INTERWORKING
F6654	NTX167AB04	OPERATIONAL MEASUREMENTS
F6655	NTXA39AA01	NETWORK ATTENDANT BUSY VERIFICATION STATIONS
F6658	NTXA39AA01	NETWORK CAMP-ON-1
F6659	NTXA02AA02	CUSTOMER ORIGINATED TRACE
F6660	NTXA82AA02	CLASS: LINE AND OFFICE DATA
F6661	NTXA00AA02	AUTOMATIC CALL SET-UP
F6662	NTXA41AA01	CALLING NUMBER DELIVERY BLOCKING
F6663	NTX833AA03	LIM CORE MAINTENANCE I
F6664	NTX833AA03	LIM CORE MAINTENANCE II
F6665	NTX833AA03	LIM LOCAL MAINTENANCE
F6666	NTX833AA03	LIM F BUS MAINTENANCE
F6669	NTX940AA06	24MB MEMORY
F6671	NTX940AA06	MS SUPPORT FOR 9X32
F6676	NTXA79AA02	IBN TRUNKS WITH ISUP SIGNALLING
F6677	NTXA80AA01	NETWORK NAME DISPLAY
F6679	NTX833AA03	STP - MESSAGE TRANSFER PART
F6680	NTX946AB01	NAME DISPLAY FOR MADN SECONDARY MEMBERS
F6682	NTX878AB02	ENHANCED MAON CALL CONTROL
F6683	NTX030CC10	TOPS MP DA/INT QUEUEING
F6684	NTX030CC10	TOPS MP FORCE MANAGEMENT CONTROLS AND FADS
F6686	NTX250AA12	DATA CALL ID ON SMDR
F6687	NTXA82AA02	CLASS: INC/OTG MEMORY SLOT CALL PROCESSING
F6688	NTXA01AA01	CALLING NUMBER DELIVERY
F6689	NTXA01AA01	CLASS CMR FIRMWARE(DIAGNOSTICS)
F6690	NTXA01AA01	CLASS CMR FIRMWARE(C-SIDE INTERFACE)
F6691	NTXA01AA01	CLASS CMR FIRMWARE(OVERVIEW)
F6692	NTXA01AA01	CLASS: MODEM CARD MAINTENANCE
F6694	NTX942AA04	SLM CONTROL ENHANCEMENT

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F6695	NTX410AA02	ATTENDANT CONSOLE MONITOR DISPLAY
F6697	NTX041AB04	MTP - ROBUSTNESS IMPROVEMENTS
F6698	NTX041AB04	SCCP MANAGEMENT ROBUSTNESS
F6809	NTX106AA09	END TO END SIGNALLING
F6904	NTX750AB04	XPM ISDN CALL CAPACITY EXPANSION
F6950	NTX030CC10	TOPS MP TRUNKING
F6951	NTX030CC10	TOPS MP EXPANDED OGT AND XFR KEY CAPABILITY
F6952	NTXA62AA01	TOPS MP FORCE MANAGEMENT DATAFILL AND OMS
F6953	NTXA62AA01	TOPS MP DA/INT CALL PROCESSING
F6955	NTX030CC10	TOPS MP KEY FUNCTIONS AND SCREEN UPDATES
F6956	NTXA62AA01	TOPS MP ARU CALL PROCESSING
F6959	NTX167AB04	ISUP PROTOCOL VERSION CONTROL
F6960	NTXA64AA03	RES FEATURE SET EXPANSION 1
F6961	NTXA64AA03	RES FEATURE SET EXPANSION 2
F6963	NTX881AC02	BIT ERROR RATE PERFORMANCE COVERAGE ENHANCEMENTS
F6964	NTX188AA02	AMA FOR TOPSMP DA CALLS
F6967	NTX833AA03	BUFFER MANAGEMENT SYSTEM
F6968	NTX833AA03	TPS ROBUSTNESS AND FAULTS
F6969	NTX750AB04	ISDN LCM CALL PROCESSING II
F6970	NTX750AB04	ISDN LCM C-CHANNEL INTERFACE ENHANCEMENTS
F6975	NTXE32AA01	PREVENTATIVE CYCLICAL RETRANSMISSION
F6976	NTX835AA01	CAPABILITY (1.1)
F6977	NTX839AA01	MTP - BERT CAPABILITY FOR STP
F6978	NTX833AA03	STP MTP ROUTESET MANAGEMENT
F6979	NTX833AA03	STP MTP CAPABILITY CODES
F6983	NTXA66AA01	PM MAP ENHANCEMENTS
F6984	NTXA66AA01	XPM IPML DATA DISTRIBUTION
F6985	NTXA66AA01	XPM PSIDE DATA DISTRIBUTION
F6994	NTX001AA21	ENHANCED AMADUMP CAPABILITY
F6997	NTX273AA07	MPC-OM PP INTERFACE TO CC
F6998	NTX892AA03	MPC-OM GROUP DEFINITION/COLLECTION FOR MPCFAST SUBSYS
F6999	NTX273AA07	MPC-OM GROUP DEFINITIONS
F7051	NTX273AA07	MPC-OM COLLECTION(CC)
F7052	NTX273AA07	MPC-OM CC INTERFACE TO PP AND PP DATA REGISTRATION
F7053	NTX273AA07	MPC-OM PP LINK DATA COLLECTION
F7055	NTX001AA21	TRAPINFO ENHANCEMENTS
F7056	NTX001AA21	PARMCAL VERIFICATION OF OFFICE PARAMETERS
F7058	NTX001AA21	FIXED TRUNK GROUP NUMBERING FOR THE OM SYSTEM
F7062	NTX825AA02	AUTOMATIC CALL GAPPING
F7063	NTX103AA09	DISA ROBUSTNESS
F7066	NTX940AA06	CM REXTEST ENHANCEMENTS
F7068	NTXA90AA01	TPC HSDA SOFTWARE
F7069	NTXA90AA01	TPC HSDA ROM
F7070	NTXA90AA01	TPC HSDA DOWNLOADER
F7071	NTXA90AA01	TPC HSDA DRIVER
F7072	NTXA90AA01	TPC HSDA MAINTENANCE SERVER
F7073	NTXA90AA01	TPC HSDA MAN MACHINE INTERFACE
F7074	NTXA90AA01	TPC SERVICE INTERWORKING

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F7075	NTXA90AA01	TPC TAMI RESTRUCTURE
F7076	NTXA90AA01	TPC MESSAGING
F7077	NTXA90AA01	TPC MESSAGING HANDLER
F7078	NTXA91AA01	DA APPLICATION
F7079	NTXA91AA01	TPC DA APPLICATION - CCI
F7084	NTXA40AA02	DN ATTRIBUTES SERVICE ORDER ENHANCEMENT
F7085	NTXA00AA02	NETWORK DIAL PLAN DISPLAY
	NTXA35AA03	
	NTX790AA03	
F7086	NTX167AB04	ISUP TRUNKS TO ATTENDANT CONSOLE INTERWORKING
F7088	NTX000AA13	SUPER CC SYNC AND LDMATE
F7090	NTXA39AA01	NETWORK ATTENDANT BUSY VERIFICATION STATIONS PHASE 1
F7094	NTX100AA20	BLIND TRANSFER RECALL
F7095	NTX030CC10	TOPS BASE MMI CHANGES ENHANCEMENTS
F7103	NTX941AA05	24 MB MEMORY PHASE II
F7105	NTX942AA04	SLM FILE SYSTEM PHASE 2
F7106	NTX942AA04	SLM DIAGNOSTIC ENHANCEMENTS
F7108	NTX833AA03	PHYSICAL LEVEL MAINTENANCE FOR FBUS
F7110	NTX833AA03	FTS PHASE I
F7111	NTX833AA03	STP STP LIU7 MAINTENANCE
F7112	NTX833AA03	SS7 MTP LINKSET MANAGEMENT
F7114	NTX833AA03	STP LIM LOCAL CONTROL
F7115	NTX833AA03	STP LIM MMI
F7116	NTX833AA03	STP LIM MAP
F7117	NTX074AA06	AUTOMATIC IMAGE DUMP
F7118	NTX001AA21	SCHEDULED XPM PATCH APPLICATION
F7119	NTX001AA21	SCHEDULED CC/CM PATCH APPLICATION/IMAGE
F7121	NTX983AA01	PRIVATE VIRTUAL NETWORKING
F7122	NTX270AA12	ISDD PART 2
F7124	NTXA67AA01	XPM 6X45BA MAINTENANCE ENHANCEMENTS
F7125	NTX270AA12	XPM ROM DIAGNOSTIC IMPROVEMENTS
F7126	NTXA67AA01	XPM IMC DIAGNOSTICS
F7128	NTX562AA02	FILE TRANSFER FROM DNC TO DMS VIA NOP 1X.25
F7131	NTXA67AA01	XPM MATE DIAGNOSTIC
F7132	NTX270AA12	XPM IPML MESSAGING FOR OFFICE RECOVERY
F7133	NTX270AA12	XPM BOOTSTRAP IMC/IPML MESSAGING ENHANCEMENT FOR NT6X69
F7134	NTXA67AA01	XPM TASK LEVEL UART IMC MESSAGING ENHANCEMENT
F7135	NTX833AA03	LIV7 CORE MAINTENANCE II
F7140	NTX100AA20	BLIND TRANSFER RECALL IDENTIFICATION
F7142	NTX563AA03	DMS DATA COLLECTION
F7145	NTX030BA03	TOPS BILINGUAL MMI FOR DEVICES
F7146	NTX791AA02	NETWORK RING AGAIN - CC SUPPORT
F7148	NTX835AA01	STP - SEAS DELAYED ACTIVATION COMMANDS
F7151	NTX030CC10	TOPS BASE MMI MODIFICATION
F7152	NTX108AA05	ENHANCED REASON DISPLAY
F7154	NTX833AA03	TABLE CONTROL FOR STP LIM
F7168	NTX750AB04	LCMI PROCESSOR UPGRADE SUPPORT
F7171	NTX563AA03	BNM CUSTOMER DATA UPLOAD ENHANCEMENT

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F7175	NTX001AA21	DIRP RECORDING SPACE USAGE ENHANCEMENTS
F7178	NTXE00AA01	TOPS OPERATOR PASSWORD
F7183	NTXA39AA01	NCOS AND CLID DISPLAY ON AC-II
F7190	NTX901AA17	LCM CND SUPPORT
F7194	NTX840AA01	STP GATEWAY
F7200	NTX106AA09	CALL WAITING ORIGINATION FOR EBS
F7201	NTX106AA09	DIAL CALL WAITING FOR EBS
F7202	NTX901AA17	CHANGE LINE TREATMENT GROUP
F7204	NTXA90AA01	REMOTE SONALERT FOR TOPS-MP
F7206	NTX731AA03	
F7206	NTX380AA02	DUAL RCC ESA FORCE DOWN OPTION
F7207	NTX055AA03	TTP DETACHED USER
F7208	NTX000AA13	MTCBASE PERFORMANCE ENHANCEMENTS
F7210	NTXA90AA01	OPERATOR LOGON PASSWORD FOR TOPS-MP
F7216	NTX731AA03	
F7216	NTX074AA06	DISK SOFTWARE REWRITE - PHASE 2
F7228	NTX270AA12	CC MANUAL SUPPORT FOR DEAD SYSTEM RECOVERY
F7229	NTX791AA02	TANDEM NETWORK RING AGAIN ON PRA
F7231	NTXA01AA01	CLASS: CMR FIREWARE(CALLING NUMBER DELIVERY)
F7232	NTXA00AA02	CLASS: AUTO CALL BACK AUTO RECALL ENHANCEMENTS
F7234	NTXA64AA03	RES/CLASS SERVICE ORDER SIMPLIFICATION AND OA AND M
F7235	NTXA02AA02	CLASS: CUSTOMER ORIGINATED TRACE ENHANCEMENTS
F7236	NTXA82AA02	CLASS: CALL MEMORY ENHANCEMENTS
F7237	NTXA41AA01	CLASS: CALLING NUMBER DELIVERY BLOCKING ENHANCEMENTS
F7240	NTXA01AA01	CLASS: CMR FACILITY MAINTENANCE
F7244	NTX892AA03	LINK ENHANCEMENTS FOR MPC MULTILINK MANAGEMENT
F7253	NTX041AB04	DATA MANAGER ROBUSTNESS
F7258	NTX791AA02	OMS FOR NRAG ON PRA
F7269	NTX001AA21	MTCBASE PERFORMANCE TOOLS
F7270	NTX250AA12	DATAPATH PROFILE ENHANCEMENTS II
F7271	NTX250AA12	HAYES KEY BOARD DIALING HIGH SPEED ENHANCEMENTS
F7293	NTX750AB04	ISDN LTC ISP LOADER
F7294	NTX750AB04	ISP DIAGNOSTICS
F7296	NTX750AB04	ISDN LTC PM MAINTENANCE I
F7298	NTX750AB04	ISDN LTC/ISP COMMUNICATIONS
F7299	NTX750AB04	ISDN DCH DEVICE INTERFACE
F7300	NTX750AB04	ISDN LTC DCH SWACT SUPPORT
F7304	NTX750AB04	LTCI WARM SWACT
F7307	NTX750AB04	ISDN LTC LOOP EXPANSION
F7319	NTXA35AA03	NETWORK DISPLAY ENHANCEMENT
F7325	NTX791AA02	PRA/CCS7 NETWORK RING AGAIN
F7326	NTX791AA02	FACILITY REJECT MESSAGE ON PRA
F7348	NTX835AA01	SEAS DATA COLLECTION II
F7350	NTX790AA03	PRA INTERWORKING WITH DMS TRUNK GROUP TYPES
F7353	NTX750AB04	ISDN LTC - ISP AND DCH PERFORMANCE MONITORING
F7356	NTXA79AA02	AC TO IBNISUP INTERWORKING
F7357	NTXA39AA01	NETWORK CAMP-ON II
F7358	NTXA39AA01	NETWORK ATTENDANT CONTROL

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F7359	NTXA39AA01	NETWORK ATTENDANT RECALL
F7360	NTXA39AA01	NETWORK CLID AND NCOS DISPLAY INTERACTION WITH 3WC
F7362	NTX835AA01	SEAS - TABLE CONTROL REPORTING
F7363	NTX001AA21	HX IMMUNITY REGIONS FOR C1 PROCESSES
F7364	NTX790AA03	ISDN PRA MAINTENANCE - INTERACTIONS II
F7381	NTX001AA21	OUTGOING MESSAGE FLOW CONTROL - CC
F7382	NTXA90AA01	HSDA DIAGNOSTICS
F7397	NTX563AA03	BNM-DMS UPLOAD SUPPORT FOR ISDN STATION DATA
F7405	NTX940AA06	DMS-BUS SOFTWARE SUPPORT FOR THE NEW 9X23 BACKCARD
F7411	NTXA82AA02	CLASS: USAGE SENSITIVE PRICING BILLING
G0003	NTX112AB03	VFG INWATS OVFL TOTALS TO AMA TAPE - IBN
G0007	NTX030CC10	EXPANDED FXDNMAP
G0011	NTX946AA01	CALLING NAME DISPLAY
	NTX946AB01	
G0017	NTX857AA01	IBN-OPTIONAL CALL FORWARD LINKS
G0018	NTX857AA01	STATION ACTIVATION OF CFW BUSY/DONT ANSWER
G0021	NTX100AA20	CALL WAITING AND 3WC INTERACTION
G0029	NTX187AA03	CARRIER CODE ON AMA FOR TERMINATING TOPS CALLS
G0030	NTXA11AA01	PATCH DOWNLOADING VIA X.25
G0034	NTX165AA06	BELLCORE AMA - ENHANCED ARS TRANSLATIONS
G0035	NTXA15AA01	CCS7-CALL PROGRESS/COMFORT TONE
G0039	NTX733AB02	CHANGE LINE CLASS CODES VIA SERVORD
	NTX733AC01	
G0040	NTX733AC01	GROUP NUMBER FEATURE CONTROL
G0047	NTXA20AA01	TOPS MP INTERFACE TO OPERATOR REFERENCE DATABASES (ORDB)
G0049	NTX250AA12	DATAPATH COAX ELIMINATION FOR IBM 3194 TERMINALS
G0051	NTXA24AA01	EQUAL ACCESS ENHANCED CARRIER TOLL DENIAL
G0052	NTX711AB02	EQUAL ACCESS MULTIPARTY LINE IDENTIFICATION
G0053	NTX187AA03	TOPS FGB CALL CODE 134
G0055	NTXA26AA01	TOPS INCOMING FEATURE GROUP D SIGNALLING
G0056	NTXA28AA02	TOPS AMA ON OPERATOR SEQUENCE CALLS
G0057	NTXA28AA02	BUSY LINE VERIFY AVERAGE WORK TIME (AWT) ENHANCEMENTS
G0058	NTXA28AA02	SPECIAL VERIFY AVERAGE WORK TIME (AWT) ENHANCEMENT
G0060	NTX001AA21	CONFERENCE CIRUCIT (3/6 PORT) DIAGNOSTIC ENHANCEMENT
G0063	NTX106AA09	MDC CIRCUIT TEST ENHANCEMENT
G0070	NTX065AA10	SERVICE ANALYSIS FOR ATC TRUNKS
G0073	NTX219AB03	TEEN SERVICE ENHANCEMENT
G0074	NTX215AA02	SES FEATURE GROUP B EVALUATION
G0075	NTX416AC01	ACD MULTI-STAGE QUEUE STATUS LAMP
G0078	NTXA27AA01	EXECUTIVE CONFERENCE
G0081	NTXA31AA01	DISA THIRD DIAL TONE
G0082	NTXA32AA01	DISTINCTIVE CALL WAITING RINGBACK
G0083	NTXA33AA01	MADN RING FORWARD
G0085	NTXA72AA01	SECONDARY MADN CALL FORWARDING
G0088	NTX101AA13	TRANSFER FOR UCD
G0089	NTX416AC01	ACD CALLED NAME/NUMBER DISPLAY
G0090	NTX101AA13	SECOND AND THIRD RECORDED ANNOUNCEMENT
G0099	NTX243AA07	380 MBYTE DISK FOR DPP

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G0106	NTXA64AA03	TEEN SERVICE ON RES
G0112	NTX902AA07	ENHANCED ESSENTIAL SERVICE PROTECTION
G0115	NTX843AB01	MF MONITOR FOR TYPE 2A CELLULAR INTERCONNECT
G0116	NTX001AA21	MEMORY ADMINISTRATION - NEW OM
G0117	NTX710AA02	LEAS-SPECIAL DIRECTORY NUMBER IDENTIFICATION
G0118	NTX102AA04	ANI INFORMATION IN SMDR OUTPUT
G0120	NTXA89AA01	RECORDING DATA TIMER DUMP
G0127	NTXE39AA01	CALL FORWARD BUSY/DON'T ANSWER-INTERNAL/EXTERNAL SPLIT

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NTXA00AA02	NTXA40AA02 NTXA64AA03 NTXA82AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	CLASS - CALL SETUP DIRECTORY NUMBER (DN) ATTRIBUTES RES(RESIDENTIAL ENHANCED SERVICES) BASE CLASS LINE OFFICE DATA BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTXA01AA01	NTXA40AA02 NTXA64AA03 NTXA82AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX270AA12 NTX413AA01 NTX898AA01 NTX901AA17	CLASS: CALLING NUMBER DISPLAY DIRECTORY NUMBER (DN) ATTRIBUTES RES(RESIDENTIAL ENHANCED SERVICES) BASE CLASS LINE OFFICE DATA BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) NEW PERIPHERAL MAINTENANCE PACKAGE IBN - ENHANCED CALL FORWARDING VARIABLE SPEED CALL ACCESS CODE - IBN LOCAL FEATURES I
NTXA02AA02	NTXA40AA02 NTXA64AA03 NTXA82AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	CLASS: CUSTOMER ORIGINATED TRACE DIRECTORY NUMBER (DN) ATTRIBUTES RES(RESIDENTIAL ENHANCED SERVICES) BASE CLASS LINE OFFICE DATA BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTXA11AA01	NTX000AA13 NTX001AA21	PATCH ADMINISTRATION & DOWNLOADING VIA X.25 BILGE COMMON BASIC
NTXA15AA01 EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX550AA02 NTX041AA07 NTX041AB04 NTX801AA01 NTX901AA17	CALL PROGRESS TONES BILGE COMMON BASIC CCS7 - TRANSACTION SERVICE SUPPORT CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA) TOLL FEATURES I LOCAL FEATURES I
NTXA20AA01		TOPS MP INTERFACE TO OPERATOR REFERENCE DATABASE
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EITHER	NTXA90AA01 NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS-MP TERMINAL HANDLER HIGH SPEED BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXA24AA01 EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX186AA06 NTX710AA02 NTX801AA01 NTX901AA17	EQUAL ACCESS ENHANCED CARRIER TOLL DENIAL BILGE COMMON BASIC EQUAL ACCESS END OFFICE LATA EQUAL ACCESS SYSTEM TOLL FEATURES I LOCAL FEATURES I
NTXA26AA01 EITHER	NTX000AA13 NTX001AA21 NTX187AA03 NTX188AA02 NTX714AA01 NTX801AA01 NTX891AA01 NTX030CC10	TOPS INCOMING FEATURE GROUP D SIGNALLING BILGE COMMON BASIC TOPS - EQUAL ACCESS TOPS - BCR AMA FORMAT TOPS INTERLATA CARRIER SERVICE TOLL FEATURES I TOPS - EXCHANGE ACCESS OPR SERV SIG TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXA27AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX111AA03 NTX901AA17	EXECUTIVE CONFERENCE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - LARGE CONFERENCE LOCAL FEATURES I
NTXA28AA02 EITHER	NTX000AA13 NTX001AA21 NTX030CC10	TOPS AWT ENHANCEMENTS BILGE COMMON BASIC TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXA31AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	DISA THIRD DIAL TONE - IBN BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTXA32AA01		DISTINCTIVE CALL WAITING RINGBACK
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	NTX000AA13 NTX001AA21 NTX100AA20 NTX435AA02 NTX901AA17	BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN SUPERSET LOCAL FEATURES I
NTXA33AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX878AB02 NTX901AA17	MADN RING FORWARD BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF NTX878AA LOCAL FEATURES I
NTXA35AA03 EITHER OR EITHER	NTXA40AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX901AA17 NTX041AA07 NTX041AB04 NTX167AB04	NETWORK NUMBER DISPLAY DIRECTORY NUMBER (DN) ATTRIBUTES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES LOCAL FEATURES I CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA) CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
NTXA36AA01 EITHER OR	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX270AA12 NTX550AA02 NTX901AA17 NTX041AA07 NTX041AB04	NETWORK WIDE RING AGAIN BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET NEW PERIPHERAL MAINTENANCE PACKAGE CCS7 - TRANSACTION SERVICE SUPPORT LOCAL FEATURES I CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTXA39AA01	NTXA35AA03 NTXA40AA02 NTXA79AA02 NTXA80AA01 NTX000AA13 NTX001AA21	MERIDIAN NETWORK ATTENDANT SERVICE NETWORK NUMBER DISPLAY DIRECTORY NUMBER (DN) ATTRIBUTES IBN TRUNKS WITH ISUP SIGNALLING NETWORK NAME DISPLAY BILGE COMMON BASIC
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EITHER EITHER OR EITHER OR	NTX100AA20 NTX106AA09 NTX108AA05 NTX270AA12 NTX901AA17 NTX167AB04 NTX041AA07 NTX041AB04 NTX946AA01 NTX946AB01	INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA) CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA) EBS - CALL NAME DISPLAY(UPG. BY NTX946AB) EBS - CALL NAME DISPLAY(UPG.OF NTX946AA IN BCS26)
NTXA40AA02	NTX000AA13 NTX001AA21 NTX901AA17	DIRECTORY NUMBER (DN) ATTRIBUTES BILGE COMMON BASIC LOCAL FEATURES I
NTXA41AA01	NTXA40AA02 NTXA64AA03 NTXA82AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	CLASS: CALLING NUMBER DELIVERY BLOCKING ADMINISTRATION DIRECTORY NUMBER (DN) ATTRIBUTES RES(RESIDENTIAL ENHANCED SERVICES) BASE CLASS LINE OFFICE DATA BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTXA43AA01	NTXA64AA03 NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	CALL FORWARD REMOTE ACTIVATION RES(RESIDENTIAL ENHANCED SERVICES) BASE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTXA52AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX415AA04 NTX407AB01 NTX560AA03 NTX560AB02 NTX991AA01 NTX991AB02	ACD REMOTE LOAD MANAGEMENT(UPG.BY NTXA52AB) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) ACD BASIC ACD - CALL PROCESSING (UPGR. OF NTX407AA) NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA) ACD - MANAGEMENT REPORTS 2 WAY DATA STREAM(UPG.BY NTX991AB) ACD-MGMT REP 2 WAY DATA STREAM(UPG OF NTX991AA IN BCS26)
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NTXA52AB01	NTX000AA13 NTX001AA21 NTX100AA20 NTX415AA04 NTX901AA17 EITHER NTX407AB01 EITHER NTX560AA03 OR NTX560AB02 EITHER NTX991AA01 OR NTX991AB02	ACD REMOTE LOAD MANAGEMENT I (UPG. OF NTXA52AA IN BCS26) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) ACD BASIC LOCAL FEATURES I ACD - CALL PROCESSING (UPGR. OF NTX407AA) NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA) ACD - MANAGEMENT REPORTS 2 WAY DATA STREAM(UPG.BY NTX991AB) ACD-MGMT REP 2 WAY DATA STREAM(UPG OF NTX991AA IN BCS26)
NTXA60AA01	NTX000AA13 NTX001AA21 NTX801AA01 EITHER NTX030CC10	TOPS CLOSEDOWN(REPLACES NTX134BB AND NTX039AB) BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXA62AA01	NTX000AA13 NTX001AA21 NTX273AA07 NTX801AA01 NTX892AA03 EITHER NTX030CC10	TOPS MP DA/AUDIO RESPONSE BILGE COMMON BASIC MULTI - PROTOCOL CONTROLLER BX.25 TOLL FEATURES I MPC MULTILINK MANAGEMENT TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXA63AA01	NTXA62AA01 NTX000AA13 NTX001AA21 NTX801AA01 NTX892AA03 EITHER NTX030CC10	TOPS MP AUDIO RESPONSE INTERFACE I TOPS MP DA/AUDIO RESPONSE BILGE COMMON BASIC TOLL FEATURES I MPC MULTILINK MANAGEMENT TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXA64AA03	NTX000AA13 NTX001AA21 NTX100AA20 NTX413AA01 NTX898AA01	RES(RESIDENTIAL ENHANCED SERVICES) BASE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - ENHANCED CALL FORWARDING VARIABLE SPEED CALL ACCESS CODE - IBN
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	NTX901AA17	LOCAL FEATURES I
NTXA66AA01	NTX000AA13 NTX001AA21 NTX270AA12	ENHANCED OFFICE RECOVERY BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTXA67AA01	NTX000AA13 NTX001AA21 NTX270AA12	EXTENDED XPM DIAGNOSTICS BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTXA69AA01	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17	DIGITAL NAILED-UP SPECIAL SERVICE BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTXA72AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX413AA01 NTX878AB02 NTX901AA17	SECONDARY MADN CALL FORWARDING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - ENHANCED CALL FORWARDING ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF NTX878AA LOCAL FEATURES I
NTXA77AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX101AA13 NTX106AA09 NTX901AA17	ENHANCED UCD BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - ENHANCED BUSINESS SERVICES IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTXA79AA02 EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX270AA12 NTX901AA17 NTX167AB04	IBN TRUNKS WITH ISUP SIGNALLING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
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EITHER OR	NTX041AA07 NTX041AB04	CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTXA80AA01 EITHER EITHER OR EITHER OR	NTXA35AA03 NTXA40AA02 NTXA79AA02 NTX000AA13 NTX100AA20 NTX106AA09 NTX108AA05 NTX270AA12 NTX901AA17 NTX167AB04 NTX041AA07 NTX041AB04 NTX946AA01 NTX946AB01	NETWORK NAME DISPLAY NETWORK NUMBER DISPLAY DIRECTORY NUMBER (DN) ATTRIBUTES IBN TRUNKS WITH ISUP SIGNALLING BILGE INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA) CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA) EBS - CALL NAME DISPLAY(UPG. BY NTX946AB) EBS - CALL NAME DISPLAY(UPG.OF NTX946AA IN BCS26)
NTXA81AA01	NTXA64AA03 NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX270AA12 NTX878AB02 NTX901AA17	EXTENSION BRIDGED SERVICES RES(RESIDENTIAL ENHANCED SERVICES) BASE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET NEW PERIPHERAL MAINTENANCE PACKAGE ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF NTX878AA LOCAL FEATURES I
NTXA82AA02	NTXA64AA03 NTX000AA13 NTX001AA21 NTX100AA20 NTX270AA12 NTX413AA01 NTX898AA01 NTX901AA17	CLASS LINE OFFICE DATA RES(RESIDENTIAL ENHANCED SERVICES) BASE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) NEW PERIPHERAL MAINTENANCE PACKAGE IBN - ENHANCED CALL FORWARDING VARIABLE SPEED CALL ACCESS CODE - IBN LOCAL FEATURES I
NTXA84AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX101AA13	EBS - MUSIC ON HOLD BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - ENHANCED BUSINESS SERVICES
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	NTX106AA09 NTX878AB02 NTX901AA17	IBN - PROPRIETARY BUSINESS SET ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF NTX878AA LOCAL FEATURES I
NTXA89AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX102AA04 NTX560AB02 NTX562AA02 NTX901AA17	SMDR TIME DUMP FOR BNM BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - STATION MESSAGE DETAIL RECORDING NOP - GENERIC RO SERVICE (UPG. OF NTX560AA) NOS - DATA COLLECTION LOCAL FEATURES I
NTXA90AA01 EITHER	NTX000AA13 NTX001AA21 NTX030BA03 NTX645AA01 NTX724AA02 NTX731AA03 NTX801AA01 NTX030CC10	TOPS-MP TERMINAL HANDLER HIGH SPEED BILGE COMMON BASIC TOPS ACD FEATURES TOPS - SERVICE BILLING TOPS MP INTERFACE TOPS MP - TERMINAL HANDLER TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXA91AA01 EITHER	NTXA90AA01 NTX000AA13 NTX001AA21 NTX030BA03 NTX645AA01 NTX724AA02 NTX731AA03 NTX801AA01 NTX030CC10	STANDARD INTERFACE FOR DA/INTERCEPT APPLICATIONS TOPS-MP TERMINAL HANDLER HIGH SPEED BILGE COMMON BASIC TOPS ACD FEATURES TOPS - SERVICE BILLING TOPS MP INTERFACE TOPS MP - TERMINAL HANDLER TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXE00AA01 EITHER	NTX000AA13 NTX001AA21 NTX030BA03 NTX801AA01 NTX030CC10	TOPS OPERATOR PASSWORD BILGE COMMON BASIC TOPS ACD FEATURES TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTXE32AA01	NTX000AA13	CCS7 PREVENTATIVE CYCLICAL RETRANSMISSION BILGE

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EITHER OR	NTX001AA21 NTX270AA12 NTX041AA07 NTX041AB04	COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTXE39AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX413AA01 NTX901AA17	CALL FORWARD BUSY/DON'T ANSWER SPLITS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - ENHANCED CALL FORWARDING LOCAL FEATURES I
NTXE60AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX250AA12 NTX901AA17	DATAPATH - CLOSED USER GROUPS (U.S.) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET DATAPATH - BASIC LOCAL FEATURES I
NTX001AA21	NTX000AA13 NTX001AA21	COMMON BASIC BILGE COMMON BASIC
NTX006AA04	NTX000AA13 NTX001AA21 NTX901AA17	BUSINESS LINES BILGE COMMON BASIC LOCAL FEATURES I
NTX007AB02	NTX000AA13 NTX001AA21 NTX901AA17	PBX INTERFACE I (UPGRADE OF NTX007AA) BILGE COMMON BASIC LOCAL FEATURES I
NTX008AB02	NTX000AA13 NTX001AA21 NTX901AA17	PBX INTERFACE II(UPG. OF NTX008AA) BILGE COMMON BASIC LOCAL FEATURES I
NTX010AA01	NTX000AA13 NTX001AA21	AUTOMATIC INTERCEPT SERVICE - LOCAL BILGE COMMON BASIC

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	NTX901AA17	LOCAL FEATURES I
NTX019AA01	NTX000AA13 NTX001AA21 NTX901AA17	CIVIC SERVICES BILGE COMMON BASIC LOCAL FEATURES I
NTX020AC01	NTX000AA13 NTX001AA21 NTX901AA17	VERTICAL SERVICES I (UPGRADE FROM NTX020AB) BILGE COMMON BASIC LOCAL FEATURES I
NTX021AA04 EITHER	NTX000AA13 NTX001AA21 NTX901AA17 NTX020AC01	REMOTE CALL FORWARDING BILGE COMMON BASIC LOCAL FEATURES I VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
NTX023AB03	NTX000AA13 NTX001AA21 NTX901AA17	REMOTE LINE MODULE (RLM) BILGE COMMON BASIC LOCAL FEATURES I
NTX024AA01	NTX000AA13 NTX001AA21 NTX023AB03 NTX901AA17	RLM INTRA-RLM CALLING BILGE COMMON BASIC REMOTE LINE MODULE (RLM) LOCAL FEATURES I
NTX025AA02	NTX000AA13 NTX001AA21 NTX023AB03 NTX901AA17	RLM EMERGENCY STAND-ALONE OPERATION BILGE COMMON BASIC REMOTE LINE MODULE (RLM) LOCAL FEATURES I
NTX030BA03 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS ACD FEATURES BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
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NTX030CC10	NTX000AA13 NTX001AA21 NTX801AA01	TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB) BILGE COMMON BASIC TOLL FEATURES I
NTX035AA03 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS REMOTE CAMA BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX036AA01 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS INWARD VALIDATION BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX039AA01 EITHER	NTX000AA13 NTX001AA21 NTX030BA03 NTX801AA01 NTX030CC10	HOST OC DATA - LINK HANDLING BILGE COMMON BASIC TOPS ACD FEATURES TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX040AA03	NTX000AA13 NTX001AA21 NTX270AA12	COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX041AA07	NTX000AA13 NTX001AA21 NTX270AA12	CCS7 - MTP/SCCP(UPG. BY NTX041AB) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX041AB04	NTX000AA13 NTX001AA21 NTX270AA12	CCS7 - MTP/SCCP(UPG.OF NTX041AA) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX042AA04	NTX000AA13 NTX001AA21	LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) BILGE COMMON BASIC
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	NTX901AA17	LOCAL FEATURES I
NTX043AA03	NTX000AA13 NTX001AA21 NTX042AA04 NTX901AA17	LOCAL CALL DETAIL RECORDING BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL FEATURES I
NTX044AA04	NTX000AA13 NTX001AA21 NTX801AA01	CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA) BILGE COMMON BASIC TOLL FEATURES I
NTX045AA01 EITHER	NTX000AA13 NTX001AA21 NTX042AA04 NTX159AA06 NTX901AA17 NTX020AC01	USAGE SENSITIVE PRICING(USP BELLCORE FORMAT) BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) BELLCORE LAMA FORMAT LOCAL FEATURES I VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
NTX048AA04	NTX000AA13 NTX001AA21	SYNCHRONIZATION BILGE COMMON BASIC
NTX048AB01	NTX000AA13 NTX001AA21 NTX048AA04	SYNCHRONIZATION - CESIUM MASTER CLOCK BILGE COMMON BASIC SYNCHRONIZATION
NTX048BA02	NTX000AA13 NTX001AA21 NTX048AA04	SYNCHRONIZATION - STRATUM 3 BILGE COMMON BASIC SYNCHRONIZATION
NTX048CA02	NTX000AA13 NTX001AA21 NTX048AA04	SYNCHRONIZATION - STRATUM 2 BILGE COMMON BASIC SYNCHRONIZATION
NTX049AC01		CIRCLE DIGIT IDENTIFICATION
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	NTX000AA13 NTX001AA21 NTX901AA17	BILGE COMMON BASIC LOCAL FEATURES I
NTX049AD01	NTX000AA13 NTX001AA21 NTX901AA17	SINGLE PARTY REVERTIVE CALLING BILGE COMMON BASIC LOCAL FEATURES I
NTX049AE01	NTX000AA13 NTX001AA21 NTX901AA17	NORTH ELECTRIC ANI FORMAT GENERATION BILGE COMMON BASIC LOCAL FEATURES I
NTX049AG01	NTX000AA13 NTX001AA21 NTX801AA01	ITT ANI FORMAT (RECEIPT) BILGE COMMON BASIC TOLL FEATURES I
NTX049AH01	NTX000AA13 NTX001AA21 NTX901AA17	COME AGAIN SIGNALLING BILGE COMMON BASIC LOCAL FEATURES I
NTX049AL01	NTX000AA13 NTX001AA21 NTX901AA17	TIME AND TEMPERATURE ANNOUNCEMENT BILGE COMMON BASIC LOCAL FEATURES I
NTX051AA02	NTX000AA13 NTX001AA21	AUTOMATIC TRUNK TESTING BILGE COMMON BASIC
NTX052AB02	NTX000AA13 NTX001AA21	REMOTE OFFICE TEST LINE (ROTL) BILGE COMMON BASIC
NTX053AA05	NTX000AA13 NTX001AA21	MAINTENANCE ASSISTANCE PACKAGE BILGE COMMON BASIC
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NTX054AA05	NTX000AA13 NTX001AA21 NTX901AA17	LINE TEST POSITION (LTP) BILGE COMMON BASIC LOCAL FEATURES I
NTX055AA03	NTX000AA13 NTX001AA21	TRUNK TEST POSITION (TTP) BILGE COMMON BASIC
NTX055AB03	NTX000AA13 NTX001AA21 NTX055AA03	TTP-DIGIT VERIFICATION BILGE COMMON BASIC TRUNK TEST POSITION (TTP)
NTX055AC02	NTX000AA13 NTX001AA21 NTX055AA03	TTP-TRANSMISSION MEASUREMENT BILGE COMMON BASIC TRUNK TEST POSITION (TTP)
NTX055BA01 EITHER OR	NTX000AA13 NTX001AA21 NTX801AA01 NTX901AA17	RONI TRUNK TESTING BILGE COMMON BASIC TOLL FEATURES I LOCAL FEATURES I
NTX056AA04	NTX000AA13 NTX001AA21	ENHANCED ADMINISTRATION BILGE COMMON BASIC
NTX057BA01	NTX057AB05	CUTOVER ASSISTANCE III (NON RESIDENT) CUTOVER ASSISTANCE II (NON RESIDENT)
NTX059AB04	NTX000AA13 NTX001AA21	POLLING OM & AUT.MSG ACCTG.DATA VIA DATAPAC(UPG.OF NTX058AD BILGE COMMON BASIC
NTX060AB10	NTX000AA13 NTX001AA21	NETWORK MANAGEMENT BILGE COMMON BASIC
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NTX060BA02	NTX000AA13 NTX001AA21 NTX060AB10	NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BB) BILGE COMMON BASIC NETWORK MANAGEMENT
NTX060BB01	NTX000AA13 NTX001AA21 NTX060AB10	NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA) BILGE COMMON BASIC NETWORK MANAGEMENT
NTX063AA02	NTX000AA13 NTX001AA21 NTX801AA01	ECHO SUPPRESSOR BILGE COMMON BASIC TOLL FEATURES I
NTX064AA01	NTX000AA13 NTX001AA21 NTX901AA17	AUTOMATIC LINE INSULATION TESTING (ALIT) BILGE COMMON BASIC LOCAL FEATURES I
NTX065AA10	NTX000AA13 NTX001AA21	SERVICE ANALYSIS BILGE COMMON BASIC
NTX066AA02	NTX000AA13 NTX001AA21	BILINGUAL INTERFACE BILGE COMMON BASIC
NTX072AA01	NTX000AA13 NTX001AA21	INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD) BILGE COMMON BASIC
NTX074AA06	NTX000AA13 NTX001AA21	DISK DATA STORAGE SYSTEM BILGE COMMON BASIC
NTX076AA01	NTX000AA13 NTX001AA21	AMA - ENHANCED BILGE COMMON BASIC
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NTX077AA01	NTX000AA13 NTX001AA21	ONLINE PERIPHERAL SOFTWARE BILGE COMMON BASIC
NTX080AA02	NTX000AA13 NTX001AA21 NTX042AA04 NTX901AA17	LAMA ENHANCED BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL FEATURES I
NTX080BA01	NTX000AA13 NTX001AA21 NTX042AA04 NTX901AA17	TERMINATING CALL BILLING(NT FORMAT) BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL FEATURES I
NTX080CA01	NTX000AA13 NTX001AA21 NTX159AA06 NTX901AA17	TERMINATING CALL BILLING(ATT FORMAT) (REP.BY NTX083AA) BILGE COMMON BASIC BELLCORE LAMA FORMAT LOCAL FEATURES I
NTX081AA01	NTX000AA13 NTX001AA21	AMA SPECIAL FORMAT BILGE COMMON BASIC
NTX082AA01	NTX000AA13 NTX001AA21 NTX901AA17	SUBSCRIBER LINE MEASUREMENTS BILGE COMMON BASIC LOCAL FEATURES I
NTX083AA01	NTX000AA13 NTX001AA21 NTX042AA04 NTX901AA17	FEATURE GROUP A(UPG. OF NTX083AA) BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL FEATURES I
NTX085AA05	NTX000AA13 NTX001AA21	TRAFFIC SEPARATION PEG COUNT BILGE COMMON BASIC

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NTX087AA04	NTX000AA13 NTX001AA21	TRAFFIC SEPARATION USAGE BILGE COMMON BASIC
NTX088AA04	NTX000AA13 NTX001AA21 NTX053AA05	TRAFFIC SEPARATION REPORT BILGE COMMON BASIC MAINTENANCE ASSISTANCE PACKAGE
NTX090AA01	NTX000AA13 NTX001AA21 NTX901AA17	COIN SERVICES BILGE COMMON BASIC LOCAL FEATURES I
NTX093AA01 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	REMOTE/TOLL CALL FORWARDING-TOPS OFFICE BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX094AA01	NTX000AA13 NTX001AA21 NTX901AA17	DIGITAL SUBSCRIBER SERVICES BILGE COMMON BASIC LOCAL FEATURES I
NTX096AA01 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS NOTIS FORMAT BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX098AA03	NTX000AA13 NTX001AA21 NTX044AA04 NTX801AA01	BELLCORE CAMA FORMAT BILGE COMMON BASIC CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA) TOLL FEATURES I
NTX099AA01	NTX000AA13 NTX001AA21	OPERATIONAL MEASUREMENTS ENHANCEMENTS BILGE COMMON BASIC

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NTX100AA20	NTX000AA13 NTX001AA21 NTX901AA17	INTEGRATED BUSINESS NETWORKS - BASIC (IBN) BILGE COMMON BASIC LOCAL FEATURES I
NTX101AA13	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - ENHANCED BUSINESS SERVICES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX102AA04	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - STATION MESSAGE DETAIL RECORDING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX103AA09	NTX000AA13 NTX001AA21 NTX100AA20 NTX102AA04 NTX901AA17	IBN - SMDR ENHANCED BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - STATION MESSAGE DETAIL RECORDING LOCAL FEATURES I
NTX103BA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX102AA04 NTX103AA09 NTX106AA09 NTX901AA17	IBN STATION SPECIFIC AUTHORIZATION CODES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - STATION MESSAGE DETAIL RECORDING IBN - SMDR ENHANCED IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTX105AA03	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	TRUNK QUEUING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX106AA09	NTX000AA13 NTX001AA21 NTX100AA20	IBN - PROPRIETARY BUSINESS SET BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN)

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	NTX270AA12 NTX901AA17	NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX108AA05	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX901AA17	IBN - DISPLAY FEATURES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTX110AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX262AA01 NTX901AA17	IBN - HOSPITAL BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN PRIORITY CONSOLE ALERTING LOCAL FEATURES I
NTX111AA03	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - LARGE CONFERENCE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX112AB03	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - VIRTUAL FACILITY GROUPS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX113AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - AUTOVON INTERFACE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX119AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN-MESSAGE SERVICE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX120AA01		OFFICE HARDWARE INVENTORY PACKAGE
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	NTX000AA13 NTX001AA21	BILGE COMMON BASIC
NTX121AA01	NTX000AA13 NTX001AA21	OVERLAP OUTPULSING (TRK TO TRK) BILGE COMMON BASIC
NTX122AA02	NTX000AA13 NTX001AA21	OM - CALL ATTEMPTS SUMMARY BILGE COMMON BASIC
NTX127AA01	NTX000AA13 NTX001AA21 NTX901AA17	WARM LINE BILGE COMMON BASIC LOCAL FEATURES I
NTX129AA02	NTX000AA13 NTX001AA21 NTX801AA01	TWO WAY OPERATOR OFFICE TRUNK BILGE COMMON BASIC TOLL FEATURES I
NTX134BA02 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX136AA03	NTX000AA13 NTX001AA21	AUTOMATIC TRANSMISSION MEASURING SYSTEM BILGE COMMON BASIC
NTX139AA01	NTX000AA13 NTX001AA21 NTX901AA17	REVERTIVE PULSING ON DIGITAL LINES BILGE COMMON BASIC LOCAL FEATURES I
NTX140AA02 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS DIAL UP AUTOQUOTE BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
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NTX141AA01 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS CITY ZONE RATING BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX142AA01	NTX000AA13 NTX001AA21 NTX270AA12	DS-1 64 KBPS CLEAR BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX143AA01	NTX000AA13 NTX001AA21 NTX270AA12	DS-1 - ESF BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX145AA05	NTX000AA13 NTX001AA21 NTX269AA07 NTX270AA12 NTX901AA17	REMOTE SWITCHING CENTER BILGE COMMON BASIC UNIVERSAL TONE RECEIVER(DOMESTIC) NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX146AA03	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17	REMOTE LINE CONCENTRATING MODULE (RLCM) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX147AB01 EITHER	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17 NTX146AA03	OUTSIDE PLANT MODULE MAINTENANCE(UPGRADE OF NTX147AA) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I REMOTE LINE CONCENTRATING MODULE (RLCM)
NTX149AA02	NTX000AA13 NTX001AA21 NTX145AA05	RSC EMERGENCY STAND ALONE OPERATION - LINES BILGE COMMON BASIC REMOTE SWITCHING CENTER
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	NTX270AA12 NTX901AA17	NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX149AB02 EITHER	NTX000AA13 NTX001AA21 NTX145AA05 NTX270AA12 NTX901AA17 NTX152AB01	RSC ESA OPERATION - LINE AND TRUNK BILGE COMMON BASIC REMOTE SWITCHING CENTER NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I RSC TRUNKING (UPG. OF NTX152AA)
NTX150AA03	NTX000AA13 NTX001AA21 NTX145AA05 NTX270AA12 NTX901AA17	RSC - INTRA RSC CALLING BILGE COMMON BASIC REMOTE SWITCHING CENTER NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX152AB01	NTX000AA13 NTX001AA21 NTX145AA05 NTX270AA12	RSC TRUNKING (UPG. OF NTX152AA) BILGE COMMON BASIC REMOTE SWITCHING CENTER NEW PERIPHERAL MAINTENANCE PACKAGE
NTX154AA03	NTX000AA13 NTX001AA21 NTX146AA03 NTX270AA12 NTX901AA17	RLCM - EMERGENCY STAND ALONE OPERATION BILGE COMMON BASIC REMOTE LINE CONCENTRATING MODULE (RLCM) NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX156AA02	NTX000AA13 NTX001AA21 NTX146AA03 NTX270AA12 NTX901AA17	INTRA RLCM CALLING BILGE COMMON BASIC REMOTE LINE CONCENTRATING MODULE (RLCM) NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX157AA01	NTX000AA13 NTX001AA21 NTX040AA03 NTX197AA01	CCIS - INWATS OSO BILGE COMMON BASIC COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC CCIS DIRECT SIGNALLING
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	NTX270AA12	NEW PERIPHERAL MAINTENANCE PACKAGE
NTX159AA06	NTX000AA13 NTX001AA21 NTX042AA04 NTX901AA17	BELLCORE LAMA FORMAT BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL FEATURES I
NTX160AA01	NTX000AA13 NTX001AA21 NTX042AA04 NTX159AA06 NTX901AA17	MULTIUNIT MESSAGE RATE SERVICES BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) BELLCORE LAMA FORMAT LOCAL FEATURES I
NTX165AA06	NTX000AA13 NTX001AA21 NTX100AA20 NTX159AA06 NTX901AA17	BELLCORE - IBN/ESN DETAIL RECORDING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) BELLCORE LAMA FORMAT LOCAL FEATURES I
NTX167AB04 EITHER OR	NTX000AA13 NTX001AA21 NTX270AA12 NTX041AA07 NTX041AB04	CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX170AA01 EITHER	NTX000AA13 NTX001AA21 NTX040AA03 NTX197AA01 NTX270AA12 NTX801AA01 NTX030CC10	CALLING CARD VALIDATION/OPERATOR ASSISTED BILGE COMMON BASIC COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC CCIS DIRECT SIGNALLING NEW PERIPHERAL MAINTENANCE PACKAGE TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX171CA02	NTX000AA13 NTX001AA21 NTX801AA01	MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA/ NTX286BA BILGE COMMON BASIC TOLL FEATURES I

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EITHER	NTX030CC10	TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX172AA01 EITHER EITHER OR	NTX000AA13 NTX001AA21 NTX030CC10 NTX170AA01 NTX171CA02	MCCS - BILLED NUMBER SCREENING BILGE COMMON BASIC TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB) CALLING CARD VALIDATION/OPERATOR ASSISTED MCCS CALL PROCESSING (ORDER VIA MASTER_PKG NTX171BA/ NTX286BA
NTX174AA03	NTX000AA13 NTX001AA21 NTX901AA17	AIOD (AUTO IDENTIFIED OUTWARD DIALING) BILGE COMMON BASIC LOCAL FEATURES I
NTX175AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - MULTI BILINGUAL CONSOLE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX186AA06	NTX000AA13 NTX001AA21 NTX042AA04 NTX072AA01 NTX159AA06 NTX901AA17	EQUAL ACCESS END OFFICE BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD) BELLCORE LAMA FORMAT LOCAL FEATURES I
NTX187AA03 EITHER	NTX000AA13 NTX001AA21 NTX188AA02 NTX386AA03 NTX030CC10	TOPS - EQUAL ACCESS BILGE COMMON BASIC TOPS - BCR AMA FORMAT ACCESS TANDEM SWITCH TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX188AA02 EITHER EITHER OR	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10 NTX098AA03 NTX159AA06	TOPS - BCR AMA FORMAT BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB) BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT
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NTX190AA01	NTX000AA13 NTX001AA21 NTX044AA04 NTX192AA01 NTX801AA01	FEAT GRP B AMA - TANDEM (NT FORMAT) BILGE COMMON BASIC CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA) 4X OPERATION - BELL FORMAT ANI TOLL FEATURES I
NTX192AA01	NTX000AA13 NTX001AA21 NTX044AA04 NTX801AA01	4X OPERATION - BELL FORMAT ANI BILGE COMMON BASIC CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA) TOLL FEATURES I
NTX193AA01	NTX000AA13 NTX001AA21 NTX044AA04 NTX801AA01	4X OPERATION - AMR 5 FORMAT ANI BILGE COMMON BASIC CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA) TOLL FEATURES I
NTX195AA05	NTX000AA13 NTX001AA21 NTX901AA17	MECHANIZED LOOP TESTER (MLT) I/F BILGE COMMON BASIC LOCAL FEATURES I
NTX196AA02	NTX000AA13 NTX001AA21 NTX901AA17	CALLING NUMBER ANNOUNCEMENT (CNA) BILGE COMMON BASIC LOCAL FEATURES I
NTX197AA01	NTX000AA13 NTX001AA21 NTX040AA03 NTX270AA12	CCIS DIRECT SIGNALLING BILGE COMMON BASIC COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX204AA02	NTX000AA13 NTX001AA21 NTX040AA03 NTX270AA12	CCIS BANDED SIGNALLING BILGE COMMON BASIC COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
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NTX206AA01	NTX000AA13 NTX001AA21 NTX901AA17	UNAUTHORIZED DIGITONE SERVICE DETECTION BILGE COMMON BASIC LOCAL FEATURES I
NTX207AA01	NTX000AA13 NTX001AA21 NTX042AA04 NTX043AA03 NTX901AA17	LCDR ENHANCED BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL CALL DETAIL RECORDING LOCAL FEATURES I
NTX208AA02 EITHER	NTX000AA13 NTX001AA21 NTX030CC10	AUTOMATIC COIN TOLL SERVICE (ACTS) BILGE COMMON BASIC TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX209AA03	NTX000AA13 NTX001AA21 NTX042AA04 NTX159AA06 NTX901AA17	FEATURE GRP B AMA - END OFFICE (ATT FORMAT) BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) BELLCORE LAMA FORMAT LOCAL FEATURES I
NTX210AA03	NTX000AA13 NTX001AA21	NO. 2 SCC INTERFACE BILGE COMMON BASIC
NTX211AA02	NTX000AA13 NTX001AA21 NTX044AA04 NTX098AA03 NTX192AA01 NTX801AA01	FEATURE GRP B AMA - TANDEM (ATT FORMAT) BILGE COMMON BASIC CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA) BELLCORE CAMA FORMAT 4X OPERATION - BELL FORMAT ANI TOLL FEATURES I
NTX213AB02	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17	SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I

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NTX215AA02 EITHER OR	NTX000AA13 NTX001AA21 NTX273AA07 NTX801AA01 NTX901AA17	SES NO.2 - INTERFACE BILGE COMMON BASIC MULTI - PROTOCOL CONTROLLER BX.25 TOLL FEATURES I LOCAL FEATURES I
NTX218AA03	NTX000AA13 NTX001AA21 NTX273AA07	1A/1B EADAS INTERFACE BILGE COMMON BASIC MULTI - PROTOCOL CONTROLLER BX.25
NTX219AB03	NTX000AA13 NTX001AA21 NTX901AA17	TEEN SERVICE BILGE COMMON BASIC LOCAL FEATURES I
NTX243AA07 EITHER OR	NTX000AA13 NTX001AA21 NTX056AA04 NTX098AA03 NTX159AA06	AMA TELEPROCESSING SYSTEM(AMATPS) BILGE COMMON BASIC ENHANCED ADMINISTRATION BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT
NTX244AA02	NTX000AA13 NTX001AA21	SEQUENTIAL TRUNK SELECTION(REP.BY NTX244AB) BILGE COMMON BASIC
NTX244AB01	NTX000AA13 NTX001AA21	ENHANCED SEQUENTIAL TRUNK HUNTING(UPG OF 244AA IN BCS23) BILGE COMMON BASIC
NTX245AA01	NTX000AA13 NTX042AA04 NTX043AA03 NTX901AA17	PUERTO RICO LINE OPTION CONTROL BILGE LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL CALL DETAIL RECORDING LOCAL FEATURES I
NTX250AA12	NTX000AA13 NTX001AA21	DATAPATH - BASIC BILGE COMMON BASIC

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Package	Needs	Title
	NTX100AA20 NTX106AA09 NTX270AA12 NTX901AA17	INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX251AA05	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX250AA12 NTX270AA12 NTX901AA17	DATAPATH - MODEM POOLING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET DATAPATH - BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX259AA03	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX250AA12 NTX270AA12 NTX901AA17	DATAPATH EXTENSION - DPX BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET DATAPATH - BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX260AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - PRESET CONFERENCE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX262AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN PRIORITY CONSOLE ALERTING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX268AA02	NTX000AA13 NTX001AA21 NTX042AA04 NTX901AA17	FEAT GRP B AMA - END OFFICE (NT FORMAT) BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) LOCAL FEATURES I
NTX269AA07	NTX000AA13	UNIVERSAL TONE RECEIVER(DOMESTIC) BILGE
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	NTX001AA21 NTX270AA12	COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX270AA12	NTX000AA13 NTX001AA21	NEW PERIPHERAL MAINTENANCE PACKAGE BILGE COMMON BASIC
NTX272AA02	NTX000AA13 NTX001AA21	FOCUSSED MAINTENANCE BILGE COMMON BASIC
NTX273AA07	NTX000AA13 NTX001AA21	MULTI - PROTOCOL CONTROLLER BX.25 BILGE COMMON BASIC
NTX277AA02	NTX000AA13 NTX001AA21 NTX901AA17	DIALABLE LINE CIRCUIT IDENTIFICATION BILGE COMMON BASIC LOCAL FEATURES I
NTX286AA01 EITHER	NTX000AA13 NTX001AA21 NTX134BA02 NTX801AA01 NTX030CC10	MCCS - QUERY VIA OC DATA LINK (ORDER BY MASTER_PKG NTX286BA) BILGE COMMON BASIC REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX290AA01	NTX000AA13 NTX001AA21	TANDEMING/SUPERVISION AND TREATMENT BILGE COMMON BASIC
NTX291AA04	NTX000AA13 NTX001AA21	ENHANCED REAL TIME INDICATOR BILGE COMMON BASIC
NTX292AB03	NTX000AA13 NTX001AA21	ENHANCED SECURITY - WITH PASSWORD ENCRYPTION BILGE COMMON BASIC
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NTX292BA02	NTX000AA13 NTX001AA21	ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION BILGE COMMON BASIC
NTX293AA02 EITHER OR	NTX000AA13 NTX001AA21 NTX292AB03 NTX292BA02	ENHANCED SECURITY PACKAGE II BILGE COMMON BASIC ENHANCED SECURITY - WITH PASSWORD ENCRYPTION ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
NTX297AA01 EITHER	NTX000AA13 NTX001AA21 NTX901AA17 NTX020AC01	BRIDGES SERVICES BILGE COMMON BASIC LOCAL FEATURES I VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
NTX299AA02	NTX000AA13 NTX001AA21 NTX270AA12 NTX398AA10 NTX901AA17	SPECIAL SERVICES - SCM(UPG BY NTX299AB) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE SCM - 100S LOCAL FEATURES I
NTX299AB01	NTX000AA13 NTX001AA21 NTX270AA12 NTX398AA10 NTX901AA17	SPECIAL SERVICES - SCM(UPG OF NTX299AA) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE SCM - 100S LOCAL FEATURES I
NTX380AA02	NTX000AA13 NTX001AA21 NTX145AA05 NTX150AA03 NTX269AA07 NTX270AA12 NTX901AA17	DUAL RCC BILGE COMMON BASIC REMOTE SWITCHING CENTER RSC - INTRA RSC CALLING UNIVERSAL TONE RECEIVER(DOMESTIC) NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX381AA01	NTX000AA13 NTX001AA21 NTX145AA05	RSC - REMOTE - OFF REMOTE BILGE COMMON BASIC REMOTE SWITCHING CENTER
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EITHER OR	NTX270AA12 NTX901AA17 NTX146AA03 NTX147AB01	NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I REMOTE LINE CONCENTRATING MODULE (RLCM) OUTSIDE PLANT MODULE MAINTENANCE (UPGRADE OF NTX147AA)
NTX385AA01	NTX000AA13 NTX001AA21	OM THRESHOLDING AND ALARMS BILGE COMMON BASIC
NTX386AA03	NTX000AA13 NTX001AA21 NTX044AA04 NTX098AA03 NTX290AA01 NTX801AA01	ACCESS TANDEM SWITCH BILGE COMMON BASIC CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA) BELLCORE CAMA FORMAT TANDEMING/SUPERVISION AND TREATMENT TOLL FEATURES I
NTX387AA04	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17	SMU - SUBSCRIBER MODULE URBAN BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX394AA01 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS - CREDIT CARD DIGIT CHECK BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX395AA01	NTX000AA13 NTX001AA21	REMOTE MAKE BUZY VIA SCAN POINT BILGE COMMON BASIC
NTX398AA10	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17	SCM - 100S BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX399AA01	NTX000AA13	IBN/ESB COMPATIBILITY BILGE
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	NTX001AA21 NTX019AA01 NTX100AA20 NTX901AA17	COMMON BASIC CIVIC SERVICES INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX407AB01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX901AA17	ACD - CALL PROCESSING (UPGR. OF NTX407AA) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTX410AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	DYNAMIC ATTENDANT CONSOLE MEASUREMENTS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX411AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX119AA02 NTX901AA17	IBN - VOICE MESSAGING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN-MESSAGE SERVICE LOCAL FEATURES I
NTX412AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - CUSTOMER STATION CHANGE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX412BA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - CUSTOMER STATION CHANGE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX412CA03	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - CUSTOMER ADMINISTRATION OF DATA BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I

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NTX413AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - ENHANCED CALL FORWARDING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX414AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX901AA17	IBN - DIRECTED CALL PARK, BUSINESS SET AND 2500 SET BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTX415AA04 EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX901AA17 NTX407AB01	ACD BASIC BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES LOCAL FEATURES I ACD - CALL PROCESSING (UPGR. OF NTX407AA)
NTX416AB02 EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX415AA04 NTX901AA17 NTX407AB01	ACD ENHANCED II(UPG. OF NTX416AA) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET ACD BASIC LOCAL FEATURES I ACD - CALL PROCESSING (UPGR. OF NTX407AA)
NTX416AC01 EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX415AA04 NTX901AA17 NTX407AB01	ACD ENHANCED II(UPG. OF NTX416AB) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET ACD BASIC LOCAL FEATURES I ACD - CALL PROCESSING (UPGR. OF NTX407AA)
NTX418AA01	NTX000AA13 NTX001AA21 NTX065AA10	IBN_SERVICE ANALYSIS BILGE COMMON BASIC SERVICE ANALYSIS

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	NTX100AA20 NTX901AA17	INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX426AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX250AA12 NTX270AA12 NTX901AA17	ASYNCHRONOUS INTERFACE LINE CARD BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET DATAPATH - BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX427AA04 EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX051AA02 NTX053AA05 NTX100AA20 NTX292AB03 NTX292BA02 NTX412BA01 NTX412CA03	END USER TESTING OF TRUNKS BILGE COMMON BASIC AUTOMATIC TRUNK TESTING MAINTENANCE ASSISTANCE PACKAGE INTEGRATED BUSINESS NETWORKS - BASIC (IBN) ENHANCED SECURITY - WITH PASSWORD ENCRYPTION ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION IBN - CUSTOMER STATION CHANGE IBN - CUSTOMER ADMINISTRATION OF DATA
NTX430AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	ESN BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX431AA03	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - CUT THROUGH DIALING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX432AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	NETWORK SPEED CALLING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX433AA01	NTX000AA13	TIME OF DAY ROUTING BILGE

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	NTX001AA21 NTX100AA20 NTX901AA17	COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX434AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	TIME OF DAY NCOS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX435AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN SUPERSET BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX436AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN ENHANCED DIAL PLAN BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX437AA01	NTX000AA13 NTX001AA21	RANDOM CONDITIONAL ROUTING BILGE COMMON BASIC
NTX445AB01	NTX000AA13 NTX001AA21	O.M. SELECTIVE OUTPUT (UPGRADE OF NTX445AA) BILGE COMMON BASIC
NTX455AA01 EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX218AA03 NTX273AA07 NTX186AA06 NTX386AA03 NTX801AA01 NTX901AA17	1A EADAS NETWORK MANAGEMENT(UPG. BY NTX455AB) BILGE COMMON BASIC 1A/1B EADAS INTERFACE MULTI - PROTOCOL CONTROLLER BX.25 EQUAL ACCESS END OFFICE ACCESS TANDEM SWITCH TOLL FEATURES I LOCAL FEATURES I
NTX455AB01	NTX000AA13	1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA) BILGE

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EITHER OR EITHER OR EITHER OR	NTX001AA21 NTX060AB10 NTX218AA03 NTX273AA07 NTX186AA06 NTX386AA03 NTX060BA02 NTX060BB01 NTX801AA01 NTX901AA17	COMMON BASIC NETWORK MANAGEMENT 1A/1B EADAS INTERFACE MULTI - PROTOCOL CONTROLLER BX.25 EQUAL ACCESS END OFFICE ACCESS TANDEM SWITCH NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BB) NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA) TOLL FEATURES I LOCAL FEATURES I
NTX550AA02 EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX270AA12 NTX801AA01 NTX901AA17 NTX041AA07 NTX041AB04	CCS7 - TRANSACTION SERVICE SUPPORT BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE TOLL FEATURES I LOCAL FEATURES I CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX554AA01 EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX270AA12 NTX550AA02 NTX098AA03 NTX159AA06 NTX041AA07 NTX041AB04	CCS7 - E800/SSP BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE CCS7 - TRANSACTION SERVICE SUPPORT BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX560AA03	NTX000AA13 NTX001AA21	NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) BILGE COMMON BASIC
NTX560AB02	NTX000AA13 NTX001AA21 NTX273AA07	NOP - GENERIC RO SERVICE (UPG. OF NTX560AA) BILGE COMMON BASIC MULTI - PROTOCOL CONTROLLER BX.25
NTX562AA02	NTX000AA13 NTX001AA21 NTX051AA02 NTX053AA05	NOS - DATA COLLECTION BILGE COMMON BASIC AUTOMATIC TRUNK TESTING MAINTENANCE ASSISTANCE PACKAGE
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EITHER OR	NTX560AA03 NTX560AB02	NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX563AA03 EITHER OR	NTX000AA13 NTX001AA21 NTX812AA03 NTX560AA03 NTX560AB02	BNM - STATION ADMINISTRATION BILGE COMMON BASIC CENTRALIZED MAP NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX571AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN - DIRECTED CALL PARK,2500 SET ONLY BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX573AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN SECURITY CODE - 2500 ONLY BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX574AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX901AA17	IBN SECURITY CODE - 2500 AND BUSINESS SETS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTX621AA02	NTX000AA13 NTX001AA21 NTX270AA12 NTX387AA04 NTX901AA17	SMU SPECIAL SERVICES BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE SMU - SUBSCRIBER MODULE URBAN LOCAL FEATURES I
NTX645AA01 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS - SERVICE BILLING BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
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NTX710AA02 EITHER OR	NTX000AA13 NTX001AA21 NTX072AA01 NTX801AA01 NTX187AA03 NTX386AA03	LATA EQUAL ACCESS SYSTEM BILGE COMMON BASIC INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD) TOLL FEATURES I TOPS - EQUAL ACCESS ACCESS TANDEM SWITCH
NTX711AA02	NTX000AA13 NTX001AA21 NTX186AA06 NTX901AA17	EQUAL ACCESS END OFFICE ENHANCEMENTS (UPG. BY NTX711AB) BILGE COMMON BASIC EQUAL ACCESS END OFFICE LOCAL FEATURES I
NTX711AB02	NTX000AA13 NTX001AA21 NTX186AA06 NTX901AA17	EQUAL ACCESS END OFFICE ENHANCEMENTS (UPG. OF NTX711AA) BILGE COMMON BASIC EQUAL ACCESS END OFFICE LOCAL FEATURES I
NTX713AA01 EITHER OR EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX165AA06 NTX901AA17 NTX098AA03 NTX159AA06 NTX112AB03	LATA-WIDE CENTREX BILLING BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) BELLCORE - IBN/ESN DETAIL RECORDING LOCAL FEATURES I BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT IBN - VIRTUAL FACILITY GROUPS
NTX714AA01 EITHER	NTX000AA13 NTX001AA21 NTX187AA03 NTX030CC10	TOPS INTERLATA CARRIER SERVICE BILGE COMMON BASIC TOPS - EQUAL ACCESS TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX717AB01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	IBN TRK VERIFICATION DESIGNATED STN (UPGR. OF NTX717AA) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I

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Package	Needs	Title
NTX719AA01	NTX001AA21 NTX100AA20 NTX106AA09 NTX901AA17	BUSINESS SET BUSY INDICATOR COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTX724AA02 EITHER	NTX000AA13 NTX001AA21 NTX801AA01 NTX030CC10	TOPS MP INTERFACE BILGE COMMON BASIC TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX727AA02 EITHER EITHER OR	NTX000AA13 NTX001AA21 NTX100AA20 NTX415AA04 NTX901AA17 NTX407AB01 NTX416AB02 NTX416AC01	ACD LOAD MANAGEMENT BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) ACD BASIC LOCAL FEATURES I ACD - CALL PROCESSING (UPGR. OF NTX407AA) ACD ENHANCED II(UPG. OF NTX416AA) ACD ENHANCED II(UPG. OF NTX416AB)
NTX727AC01 EITHER OR EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX415AA04 NTX901AA17 NTX416AB02 NTX416AC01 NTX407AB01	ACD LOAD MANAGEMENT II BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) ACD BASIC LOCAL FEATURES I ACD ENHANCED II(UPG. OF NTX416AA) ACD ENHANCED II(UPG. OF NTX416AB) ACD - CALL PROCESSING (UPGR. OF NTX407AA)
NTX727AD01 EITHER OR EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX415AA04 NTX901AA17 NTX416AB02 NTX416AC01 NTX407AB01	ACD - LOAD MANAGEMENT III BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) ACD BASIC LOCAL FEATURES I ACD ENHANCED II(UPG. OF NTX416AA) ACD ENHANCED II(UPG. OF NTX416AB) ACD - CALL PROCESSING (UPGR. OF NTX407AA)

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NTX730AA02	NTX000AA13 NTX001AA21 NTX901AA17	MULTILINK ASCII DEVICE DRIVER BILGE COMMON BASIC LOCAL FEATURES I
NTX731AA03	NTX000AA13 NTX001AA21 NTX030BA03 NTX030CC10	TOPS MP - TERMINAL HANDLER BILGE COMMON BASIC TOPS ACD FEATURES TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX732AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX101AA13 NTX119AA02 NTX730AA02 NTX901AA17	SIMPLIFIED MESSAGE DESK INTERFACE(SMDI) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - ENHANCED BUSINESS SERVICES IBN-MESSAGE SERVICE MULTILINK ASCII DEVICE DRIVER LOCAL FEATURES I
NTX733AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	ENHANCED SERVICE ORDER(UPG. BY NTX733AB) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX733AB02	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	ENHANCED SERVICE ORDER(UPG. BY NTX733AC) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX733AC01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	ENHANCED SERVICE ORDER(UPG. OF NTX733AB IN BCS26) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX734AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX186AA06	EAO - IBN OIC USING SERVORD BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) EQUAL ACCESS END OFFICE
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	NTX901AA17	LOCAL FEATURES I
NTX735AA01	NTX000AA13 NTX001AA21 NTX901AA17	FLEXIBLE ANI BILGE COMMON BASIC LOCAL FEATURES I
NTX737AA01 EITHER OR	NTX000AA13 NTX001AA21 NTX098AA03 NTX159AA06	FLEXIBLE BELLCORE AMA(UPG.BY NTX737AB) BILGE COMMON BASIC BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT
NTX737AB01 EITHER OR	NTX000AA13 NTX001AA21 NTX098AA03 NTX159AA06	FLEXIBLE BELLCORE AMA (UPG. OF NTX737AA) BILGE COMMON BASIC BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT
NTX738AA03 EITHER OR	NTX000AA13 NTX001AA21 NTX801AA01 NTX901AA17	SWITCH PERFORMANCE MONITORING SYSTEM BILGE COMMON BASIC TOLL FEATURES I LOCAL FEATURES I
NTX750AB04	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX142AA01 NTX270AA12 NTX901AA17	ISDN BASIC ACCESS(UPG. OF NTX750AA) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES DS-1 64 KBPS CLEAR NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX753AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX142AA01 NTX270AA12	ISDN FUNCTIONAL MODE BASIC RATE SERVICES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES DS-1 64 KBPS CLEAR NEW PERIPHERAL MAINTENANCE PACKAGE

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	NTX750AB04 NTX901AA17	ISDN BASIC ACCESS(UPG. OF NTX750AA) LOCAL FEATURES I
NTX790AA03 EITHER OR	NTXA40AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX142AA01 NTX270AA12 NTX750AB04 NTX901AA17 NTX244AA02 NTX244AB01	ISDN - PRIMARY RATE ACCESS BASE DIRECTORY NUMBER (DN) ATTRIBUTES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES DS-1 64 KBPS CLEAR NEW PERIPHERAL MAINTENANCE PACKAGE ISDN BASIC ACCESS(UPG. OF NTX750AA) LOCAL FEATURES I SEQUENTIAL TRUNK SELECTION(REP.BY NTX244AB) ENHANCED SEQUENTIAL TRUNK HUNTING(UPG OF 244AA IN BCS23)
NTX791AA02	NTXA40AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX142AA01 NTX270AA12 NTX750AB04 NTX790AA03 NTX901AA17	PRA: NETWORK RING AGAIN DIRECTORY NUMBER (DN) ATTRIBUTES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES DS-1 64 KBPS CLEAR NEW PERIPHERAL MAINTENANCE PACKAGE ISDN BASIC ACCESS(UPG. OF NTX750AA) ISDN - PRIMARY RATE ACCESS BASE LOCAL FEATURES I
NTX801AA01	NTX000AA13 NTX001AA21	TOLL FEATURES I BILGE COMMON BASIC
NTX802AA04	NTX000AA13 NTX001AA21 NTX801AA01	TOLL FEATURES II BILGE COMMON BASIC TOLL FEATURES I
NTX803AA02 EITHER	NTX000AA13 NTX001AA21 NTX801AA01	EQUAL ACCESS ALTERNATE SWITCHING POINT BILGE COMMON BASIC TOLL FEATURES I
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OR EITHER OR	NTX901AA17 NTX186AA06 NTX386AA03	LOCAL FEATURES I EQUAL ACCESS END OFFICE ACCESS TANDEM SWITCH
NTX806AA01	NTX000AA13 NTX001AA21 NTX020AC01 NTX901AA17	ENHANCED CALL FORWARDING - POTS BILGE COMMON BASIC VERTICAL SERVICES I (UPGRADE FROM NTX020AB) LOCAL FEATURES I
NTX807AA01	NTX000AA13 NTX001AA21 NTX020AC01 NTX901AA17	ENHANCED CALL WAITING - POTS(UPG. BY NTX807AB) BILGE COMMON BASIC VERTICAL SERVICES I (UPGRADE FROM NTX020AB) LOCAL FEATURES I
NTX807AB01	NTX000AA13 NTX001AA21 NTX020AC01 NTX901AA17	ENHANCED CALL WAITING - POTS(UPG. OF NTX807AA) BILGE COMMON BASIC VERTICAL SERVICES I (UPGRADE FROM NTX020AB) LOCAL FEATURES I
NTX808AA01	NTX000AA13 NTX001AA21 NTX020AC01 NTX901AA17	ENHANCED 3-WAY CALLING - POTS BILGE COMMON BASIC VERTICAL SERVICES I (UPGRADE FROM NTX020AB) LOCAL FEATURES I
NTX812AA03 EITHER OR	NTX001AA21 NTX560AA03 NTX560AB02	CENTRALIZED MAP COMMON BASIC NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX813AA01 EITHER OR	NTX000AA13 NTX001AA21 NTX560AA03 NTX560AB02	CENTRALIZED ALARMS BILGE COMMON BASIC NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX820AA01	NTX000AA13 NTX001AA21	ENHANCED 3-WAY CALLING - IBN BILGE COMMON BASIC

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	NTX100AA20 NTX901AA17	INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX821AA01	NTX000AA13 NTX001AA21 NTX801AA01	TANDEM OPERATOR SERVICE ROUTING BILGE COMMON BASIC TOLL FEATURES I
NTX822AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX119AA02 NTX901AA17	EBS AS MESSAGE CENTRE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES IBN-MESSAGE SERVICE LOCAL FEATURES I
NTX824AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	ENHANCED CALL WAITING - IBN(UPG. BY NTX824AB) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX824AB01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	ENHANCED CALL WAITING - IBN(UPGR. OF NTX824AA) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX825AA02 EITHER OR	NTX000AA13 NTX001AA21 NTX030CC10 NTX550AA02 NTX041AA07 NTX041AB04	EXCHANGE ALTERNATE BILLING SERVICE BILGE COMMON BASIC TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB) CCS7 - TRANSACTION SERVICE SUPPORT CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX827AA02	NTX000AA13 NTX001AA21 NTX270AA12	NEW PERIPHERALS PERFORMANCE MEASUREMENTS BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
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NTX833AA03	NTX940AA06 NTX941AA05	STP OPERATIONS CM BILGE CM COMMON
NTX834AA01	NTX833AA03	DC1S6 TRANSLATIONS STP OPERATIONS
NTX835AA01	NTX833AA03 NTX940AA06 NTX941AA05 NTX942AA04	STP - SEAS (1.1) OPERATIONS STP OPERATIONS CM BILGE CM COMMON DMS - SUPERNODE SYSTEM LOAD MODULE(SLM)
NTX839AA01	NTX833AA03 NTX940AA06 NTX941AA05 NTX942AA04	STP - ENHANCED MAINTENANCE AND BERT STP OPERATIONS CM BILGE CM COMMON DMS - SUPERNODE SYSTEM LOAD MODULE(SLM)
NTX840AA01	NTX833AA03	STP - GATEWAY MESSAGE SCREENING STP OPERATIONS
NTX843AA01 EITHER OR EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX186AA06 NTX386AA03 NTX098AA03 NTX159AA06 NTX801AA01 NTX901AA17	CELLULAR INTERCONNECT BILGE COMMON BASIC EQUAL ACCESS END OFFICE ACCESS TANDEM SWITCH BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT TOLL FEATURES I LOCAL FEATURES I
NTX843AB01 EITHER OR EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX186AA06 NTX386AA03 NTX098AA03 NTX159AA06 NTX801AA01 NTX901AA17	CELLULAR INTERCONNECT(UPG. OF NTX843AA IN BCS27) BILGE COMMON BASIC EQUAL ACCESS END OFFICE ACCESS TANDEM SWITCH BELLCORE CAMA FORMAT BELLCORE LAMA FORMAT TOLL FEATURES I LOCAL FEATURES I

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NTX850AA01 EITHER EITHER OR	NTX000AA13 NTX001AA21 NTX187AA03 NTX188AA02 NTX208AA02 NTX386AA03 NTX030CC10 NTX171CA02 NTX714AA01	TOPS ALTERNATE ANNOUNCEMENT BILGE COMMON BASIC TOPS - EQUAL ACCESS TOPS - BCR AMA FORMAT AUTOMATIC COIN TOLL SERVICE (ACTS) ACCESS TANDEM SWITCH TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB) MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA/ NTX286BA TOPS INTERLATA CARRIER SERVICE
NTX851AA01	NTX000AA13 NTX001AA21 NTX042AA04 NTX100AA20 NTX102AA04 NTX159AA06 NTX901AA17	SMDR DERIVED FROM BCR AMA BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - STATION MESSAGE DETAIL RECORDING BELLCORE LAMA FORMAT LOCAL FEATURES I
NTX856AA02	NTX000AA13 NTX001AA21 NTX100AA20 NTX410AA02 NTX901AA17	IBN ATTENDANT CONSOLE OM ON AN INDIVIDUAL CONSOLE BASIS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) DYNAMIC ATTENDANT CONSOLE MEASUREMENTS LOCAL FEATURES I
NTX857AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX413AA01 NTX901AA17	CALL FORWARDING SPECIAL - MDC BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - ENHANCED CALL FORWARDING LOCAL FEATURES I
NTX871AA01	NTX000AA13 NTX001AA21	REMOTE TOPS MP O.C. DATA LINK HANDLING BILGE COMMON BASIC
NTX873AA01	NTX000AA13 NTX001AA21 NTX030BA03	HOST TOPS MP O.C. - DATA LINK HANDLING BILGE COMMON BASIC TOPS ACD FEATURES
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EITHER	NTX724AA02 NTX801AA01 NTX030CC10	TOPS MP INTERFACE TOLL FEATURES I TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
NTX875AA01 EITHER EITHER OR	NTX000AA13 NTX001AA21 NTX270AA12 NTX167AB04 NTX041AA07 NTX041AB04	CCS7 MASS TRUNK CONVERSION BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA) CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA)
NTX877AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	INTERFACE TO NON-DATA LINK CONSOLE BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX878AB02	NTX000AA13 NTX001AA21 NTX100AA20 NTX101AA13 NTX106AA09 NTX901AA17	ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF NTX878AA) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - ENHANCED BUSINESS SERVICES IBN - PROPRIETARY BUSINESS SET LOCAL FEATURES I
NTX881AA01	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17	SWITCH BIT ERROR RATE MAINTENANCE(UPG.BY NTX881AB) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX881AB02	NTX000AA13 NTX001AA21 NTX270AA12 NTX901AA17	SWITCH BIT ERROR RATE NTCE(REP. BY NTX881AC) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE LOCAL FEATURES I
NTX881AC02	NTX000AA13 NTX001AA21 NTX270AA12	SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE

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	NTX901AA17	LOCAL FEATURES I
NTX882AA03	NTX000AA13 NTX001AA21 NTX270AA12 NTX801AA01	BIT ERROR RATIO INDICATOR FOR TOLL SWITCHES BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE TOLL FEATURES I
NTX883AA01 EITHER OR OR	NTX000AA13 NTX001AA21 NTX881AB02 NTX881AC02 NTX882AA03	INTER OFFICE TRK BIT ERROR RATE TESTING BILGE COMMON BASIC SWITCH BIT ERROR RATE NTCE (REP. BY NTX881AC) SWITCH BIT ERROR RATE MAINTENANCE (UPG. OF NTX881AB) BIT ERROR RATIO INDICATOR FOR TOLL SWITCHES
NTX885AA02	NTX000AA13 NTX001AA21 NTX270AA12	SWITCH PATH DIAGNOSTICS (UPG. BY NTX885AB) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX885AB01	NTX000AA13 NTX001AA21 NTX270AA12	SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA) BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX888AA01 EITHER OR	NTX000AA13 NTX001AA21 NTX186AA06 NTX386AA03	EAOSS BILGE COMMON BASIC EQUAL ACCESS END OFFICE ACCESS TANDEM SWITCH
NTX891AA01	NTX000AA13 NTX001AA21 NTX030CC10 NTX098AA03 NTX187AA03	TOPS - EXCHANGE ACCESS OPR SERV SIG BILGE COMMON BASIC TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB) BELLCORE CAMA FORMAT TOPS - EQUAL ACCESS
NTX892AA03	NTX000AA13 NTX001AA21 NTX273AA07	MPC MULTILINK MANAGEMENT BILGE COMMON BASIC MULTI - PROTOCOL CONTROLLER BX.25
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NTX898AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	VARIABLE SPEED CALL ACCESS CODE - IBN BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX899AA01	NTX000AA13 NTX001AA21 NTX100AA20 NTX901AA17	CALL TRANSFER ENHANCEMENTS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) LOCAL FEATURES I
NTX901AA17	NTX000AA13 NTX001AA21	LOCAL FEATURES I BILGE COMMON BASIC
NTX902AA07	NTX000AA13 NTX001AA21 NTX901AA17	LOCAL FEATURES II BILGE COMMON BASIC LOCAL FEATURES I
NTX903AA01	NTX000AA13 NTX001AA21	TRANSMISSION MEASUREMENTS BILGE COMMON BASIC
NTX942AA04	NTX940AA06	DMS - SUPERNODE SYSTEM LOAD MODULE(SLM) CM BILGE
NTX946AA01	NTXA40AA02 NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX901AA17	EBS - CALL NAME DISPLAY(UPG. BY NTX946AB) DIRECTORY NUMBER (DN) ATTRIBUTES BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES LOCAL FEATURES I
NTX946AB01	NTXA40AA02 NTX000AA13	EBS - CALL NAME DISPLAY(UPG.OF NTX946AA IN BCS26) DIRECTORY NUMBER (DN) ATTRIBUTES BILGE
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	NTX001AA21 NTX100AA20 NTX106AA09 NTX108AA05 NTX878AB02 NTX901AA17	COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET IBN - DISPLAY FEATURES ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF NTX878AA LOCAL FEATURES I
NTX983AA01 EITHER OR EITHER OR	NTX000AA13 NTX001AA21 NTX042AA04 NTX100AA20 NTX102AA04 NTX103AA09 NTX159AA06 NTX270AA12 NTX550AA02 NTX901AA17 NTX041AA07 NTX041AB04 NTX186AA06 NTX386AA03	SERVICE SWITCHING POINT PRIVATE VIRTUAL NETWORKING BILGE COMMON BASIC LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA) INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - STATION MESSAGE DETAIL RECORDING IBN - SMDR ENHANCED BELLCORE LAMA FORMAT NEW PERIPHERAL MAINTENANCE PACKAGE CCS7 - TRANSACTION SERVICE SUPPORT LOCAL FEATURES I CCS7 - MTP/SCCP(UPG. BY NTX041AB) CCS7 - MTP/SCCP(UPG.OF NTX041AA) EQUAL ACCESS END OFFICE ACCESS TANDEM SWITCH
NTX987AA01	NTX000AA13 NTX001AA21 NTX270AA12	FIBER MAINTENANCE BASIC MODE BILGE COMMON BASIC NEW PERIPHERAL MAINTENANCE PACKAGE
NTX989AA01 EITHER OR	NTX000AA13 NTX001AA21 NTX186AA06 NTX710AA02	CARRIER ACCESS CODE BLOCKING FOR IC/INC BILGE COMMON BASIC EQUAL ACCESS END OFFICE LATA EQUAL ACCESS SYSTEM
NTX991AA01 EITHER	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX273AA07 NTX415AA04 NTX901AA17 NTX416AB02	ACD - MANAGEMENT REPORTS 2 WAY DATA STREAM(UPG.BY NTX991AB) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET MULTI - PROTOCOL CONTROLLER BX.25 ACD BASIC LOCAL FEATURES I ACD ENHANCED II(UPG. OF NTX416AA)
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Package	Needs	Title
OR EITHER EITHER OR	NTX416AC01 NTX407AB01 NTX560AA03 NTX560AB02	ACD ENHANCED II(UPG. OF NTX416AB) ACD - CALL PROCESSING (UPGR. OF NTX407AA) NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX991AB02 EITHER OR EITHER EITHER OR	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX273AA07 NTX415AA04 NTX901AA17 NTX416AB02 NTX416AC01 NTX407AB01 NTX560AA03 NTX560AB02	ACD-MGMT REP 2 WAY DATA STREAM(UPG OF NTX991AA IN BCS26) BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET MULTI - PROTOCOL CONTROLLER BX.25 ACD BASIC LOCAL FEATURES I ACD ENHANCED II(UPG. OF NTX416AA) ACD ENHANCED II(UPG. OF NTX416AB) ACD - CALL PROCESSING (UPGR. OF NTX407AA) NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
NTX992AA01 EITHER OR EITHER EITHER OR	NTX000AA13 NTX001AA21 NTX100AA20 NTX106AA09 NTX415AA04 NTX901AA17 NTX416AB02 NTX416AC01 NTX407AB01 NTX560AA03 NTX560AB02	ACD MIS BILGE COMMON BASIC INTEGRATED BUSINESS NETWORKS - BASIC (IBN) IBN - PROPRIETARY BUSINESS SET ACD BASIC LOCAL FEATURES I ACD ENHANCED II(UPG. OF NTX416AA) ACD ENHANCED II(UPG. OF NTX416AB) ACD - CALL PROCESSING (UPGR. OF NTX407AA) NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB) NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
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NTXA00AA02 Status: LTD CLASS - CALL SETUP

NETWORKING	:	
AUTOMATIC CALL SET-UP		F6661
CALL PROCESSING	:	
NETWORK DIAL PLAN DISPLAY		F7085
NETWORKING	:	
CLASS: AUTO CALL BACK AUTO RECALL ENHANCEMENTS		F7232

Package	NTXA00AA02 CLASS - CALL SETUP
Feature set	NETWORKING
Feature	AUTOMATIC CALL SET-UP
Feature no	F6661

FEATURE SYNOPSIS

Custom Local Area Switching Services (CLASS) are public network features targeted for the residential market.

This activity provides two Phase 1 CLASS features: Automatic Callback (ACB) and Automatic Recall (AR).

Automatic Callback allows a subscriber to redial the last call that he made. If the called station is busy, the subscriber may queue against that station and be recalled when it becomes idle.

Automatic Recall allows a subscriber to recall the last station that called and be queued against that station if it is busy.

For ACB or AR the called station may be served by the same switch (intra-node) or a different one (internode) than the calling station. Internode callback or recall requires the CCS7 signaling system to communicate between the originating and destination node.

FEATURE DESCRIPTION

The Automatic Callback feature allows a subscriber to place a call to the last station called by the subscriber. It does not matter whether the last station called was busy or idle, answered or unanswered.

The Automatic Recall feature allows a subscriber to place a call to the last station that called the subscriber. It does not matter whether the last call received by the subscriber was answered or unanswered.

When the subscriber completes the ACB or AR activation procedure, both the busy/idle status and class of service of the called line are checked. If the terminating line is idle and the class of service permissible, call setup is attempted. If the call cannot be completed immediately because of a busy line, the call is queued and the call is attempted when both stations are idle. When both stations are idle, the calling station is given special ringing and when the calling party answers, the call is set up and the called station is given regular ringing.

Multiple ACB, and AR requests by the same subscriber are allowed concurrently. The calling party is allowed a maximum of 30 ACB or AR activations running concurrently.

The calling party may deactivate the ACB or AR request by going off-hook, receiving dial tone, and dialing the proper deactivation code. Once the

deactivation code is entered all outstanding ACB, or AR requests are deactivated.

Ref: FDOC AG0728

Package	NTXA00AA02 CLASS - CALL SETUP
Feature set	CALL PROCESSING
Feature	NETWORK DIAL PLAN DISPLAY
Feature no	F7085

FEATURE SYNOPSIS

This feature formats a calling party number into a form consistent with the called party's dial plan. This reverse translation capability for calling numbers is provided through customer datafill of newly defined translation data tables.

The initial application of this feature consists of improving the existing Electronic Business Set display capabilities by displaying the calling number in a form which is dialable by the user.

FEATURE DESCRIPTION

This feature allows the customer to define a more uniform set of formatting rules based on the dial plan and has the added advantage that the number displayed may actually be used by the subscriber to recall the calling party.

The algorithms which determine the manner in which the calling party number is manipulated for display are defined through the datafill of two new translation tables, DNREGION and DNREVLXLA. Table DNREGION identifies groups of directory numbers belonging to the same region or community of interest, while Table DNREVLXLA provides digit manipulation algorithms based on the various regions defined in Table DNREGION.

These reverse translation tables are flexible enough to support any type of dial plan. Furthermore, they can be used to define algorithms for calls made over the public network as well as any number of private networks which may be supported by the office.

Ref: FDOC AG0981

Package	NTXA00AA02 CLASS - CALL SETUP
Feature set	NETWORKING
Feature	CLASS: AUTO CALL BACK AUTO RECALL ENHANCEMENTS
Feature no	F7232

Synopsis

The Automatic Call Back (ACB) Automatic Recall (AR) Enhancements feature adds the following improvements to the ACB and AR features:

- * Subscription Usage Sensitive Pricing (SUSP)
- * customized announcements
- * an announcement identifying the directory number (DN) of the last person who called
- * an announcement indicating that the DN of the last person who called is unavailable or invalid
- * ACB and AR Operational Measurements (OMs)

Implementation

When either the ACB or AR line options is added through SERVORD, the line option parameter BILLING_OPTION must be datafilled. If AMA is datafilled, the line generates an AMA record for the use of the ACB or AR feature. If NOAMA is datafilled, no AMA record is generated.

The customized announcement phrases are datafilled in Table DRMUSERS. The announcements are available in French and English. The office parameters PRIMARY_OFFICE_LANGUAGE and SECONDARY_OFFICE_

The customized announcement identifying the DN of the last person who called or indicating that the DN of the last person who called is unavailable or invalid is datafilled in Tables ANNS, ANNMEMS, and DRMUSERS.

This feature adds two new OM groups, AR and ACB. The AR OM group contains OM registers that count various activities during the operation of the AR line feature. The ACB OM group contains OM registers that count various activities during the operation of the ACB line feature.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTXA64AA RES (Residential Enhanced Services) Base
NTXA82AA CLASS Line Office Data
NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

There are no restrictions on the use of this feature.

Reference

FDOC AG1228

NTXA01AA01 Status: LTD CLASS: CALLING NUMBER DISPLAY

NETWORKING	:	
CALLING NUMBER DELIVERY		F6688
CLASS CMR FIRMWARE(DIAGNOSTICS)		F6689
CLASS CMR FIRMWARE(C-SIDE INTERFACE)		F6690
CLASS CMR FIRMWARE(OVERVIEW)		F6691
CLASS: MODEM CARD MAINTENANCE		F6692
CLASS: CMR FIREWARE(CALLING NUMBER DELIVERY)		F7231
CLASS: CMR FACILITY MAINTENANCE		F7240

Package	NTXA01AA01 CLASS: CALLING NUMBER DISPLAY
Feature set	NETWORKING
Feature	CALLING NUMBER DELIVERY
Feature no	F6688

Synopsis

The CLASS: Calling Number Delivery feature delivers the calling party's directory number and the current time and date to the called party's customer premises equipment (CPE).

Implementation

The Calling Number Delivery feature is turned on and off across the entire office through datafill in Table RESOFC.

The Calling Number Delivery (CND) option is added to a line using Service Order (SERVORD) commands. The CND line option has the following two billing suboptions:

- * no AMA records are generated on a per delivery basis
- * an AMA record is generated each time calling information is delivered to the called party's CPE (CND Subscriber Usage Sensitive Pricing)

If the SUSP entry in table AMAOPTS is datafilled as 'ON', the CND billing suboption is prompted for when the CND option is added to a line.

The CND option is only added to lines whose supporting peripheral has a CLASS Modem Resource (CMR) card datafilled in the peripheral's associated inventory table (Table LTCINV or Table RCCINV).

The activation and deactivation codes for CND Subscriber Usage Sensitive Pricing (CND SUSP) are datafilled on a per office basis in Table IBNXLA.

The CND SUSP activation and deactivation confirmation announcements are datafilled in Table DRMUSERS. The announcements can be recorded in two languages. The office parameter OFFICE_LANGUAGE in Table OFCENG has two parameters "primary" and "secondary" to specify the primary and secondary language for the office.

This feature adds two new Operational Measurement (OM) groups, CND and CNDXPM. The CND group contains the OMs pegged by the Central Control for the Calling Number Delivery feature. The CNDXPM group counts aborts, abandons, and error cases for CND on a per XPM basis.

The ORGFSET register in the OTS OM group is pegged each time CND SUSP is successfully activated or deactivated.

The OM group ANNS is pegged when activation or deactivation announcements are successfully applied.

For CND SUSP subscribers, each time the calling number information for a terminating call is sent to the peripheral, a CND SUSP AMA record is generated.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX901AA Local Features I
NTXA40AA Directory Number Attributes
NTXA64AA Residential Enhanced Services Base
NTXA82AA CLASS Line Office Data

Activation/Deactivation

The subscriber turns CND SUSP on or off by dialing the CND SUSP activation or deactivation code on his CPE.

When the CND SUSP activation code is entered, a check is made to ensure that the CND feature is assigned for the office and that the line has the CND SUSP option assigned.

If the activation checks are successful, the subscriber receives an announcement giving CND SUSP activation confirmation. If an announcement is not datafilled in Table DRMUSERS, the subscriber receives feature confirmation tone.

When the CND SUSP deactivation code is entered, a check is made to ensure that the CND feature is assigned for the office and that the line has the CND SUSP option assigned.

If the deactivation checks are successful, the subscriber receives an announcement giving CND SUSP deactivation confirmation. If an announcement is not datafilled in Table DRMUSERS, the subscriber receives feature confirmation tone.

When the subscriber successfully deactivates CND SUSP, calling number information is no longer sent to the subscriber's display set.

The CND line option with the NOAMA billing suboption requires no activation or deactivation codes.

Interactions

If a subscriber has the Call Waiting and Calling Number Delivery features, calling number information is not transmitted when the call waiting tone is applied.

If a subscriber has the Call Forward Universal or Call Forward Busy or Call Forward Fixed feature and the Calling Number Delivery feature, the calling number information is not transmitted to the base station.

If a subscriber has the Call Forwarding Don't Answer and the Calling Number Delivery feature, the calling number information is transmitted to the base station.

If a subscriber has the CLASS Automatic Recall and the Calling Number Delivery feature, the called party's directory number is transmitted on application of distinctive alert.

If a subscriber has the CLASS Automatic Callback feature and the Calling Number Delivery feature, the called party's directory number is transmitted on application of distinctive alert.

If a subscriber has the Three Way Calling feature and/or the Call Transfer feature and the Calling Number Delivery feature, the calling number information is transmitted to the called party in the normal way, in the first leg of the call. If the calling party in the second leg of the call has the CND feature, the calling number, which may not be the current connected number, is transmitted.

If a subscriber has the Call Pickup feature and the Calling Number Delivery feature, the calling number information is not transmitted for the picked-up call.

If a subscriber has the Teen Service feature and the Calling Number Delivery feature, the calling number information is transmitted if the distinctive ringing pattern has a silent period of at least three seconds.

Restrictions

The Calling Number Delivery feature only provides delivery of the calling number on an interoffice basis if the offices are connected by CCS7 and the calling number is provided in the IAM.

The Calling Number Delivery feature is not compatible with the Denied Termination feature or the Multiple Appearance Directory Number feature.

Calling Number Delivery cannot occur when a line has either the Suspended Service or Plug up option.

If the Calling Number Delivery feature is assigned to a line with the Denied Origination or Automatic Line option, CND must have the NOAMA billing suboption.

CND SUSP cannot be activated on a line with the Requested Suspended Service option active.

Calling number information cannot be delivered to off-hook sets.

Reference

FDOC AG0781

Package	NTXA01AA01 CLASS: CALLING NUMBER DISPLAY
Feature set	NETWORKING
Feature	CLASS CMR FIRMWARE(DIAGNOSTICS)
Feature no	F6689

Synopsis

This feature provides diagnostics for the Custom Local Area Signaling Services (CLASS) Class Modem Resource (CMR) card (NTX6X78AA). The following types of diagnostics are provided:

- * non-service affecting: detects faults in CMR that impact service
- * service affecting: detects faults that affect performance of calling number delivery
- * power up test: verifies the functioning of the micro-processor and SP-to-CMR messaging interface.

The diagnostics are run on demand through the XPM Class Modem Resource card.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTXA64AA RES (Residential Enhanced Services) Base
NTXA82AA Class Line Office Data

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

Feature CLASS: Modem Card Resource Management provides the XPM messaging interface for the CMR card (NTXA01AA-FF6688).

Feature CLASS: Modem Card Maintenance provides the XPM portion of the CMR card diagnostics (NTXA01AA-F6692).

The following features work with this feature to form the firmware portion of the CLASS CMR card:

- * CLASS CMR Firmware C Side Interface
- * CLASS CMR Firmware Overview

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AC0438

Package	NTXA01AA01 CLASS: CALLING NUMBER DISPLAY
Feature set	NETWORKING
Feature	CLASS CMR FIRMWARE(OVERVIEW)
Feature no	F6691

FEATURE SYNOPSIS

Custom Local Area Signaling Services (CLASS) are a group of features that provide special features to Plain Old Telephone Service (POTS) lines.

The Class Modem Resource (CMR) card allows the DMS switch software to pass information to the CLASS set as part of the Calling Number Delivery (CND) feature of CLASS. The CMR card has a hardware and firmware component to it.

This feature provides the firmware that controls the hardware on the CMR card so that the calling number can be sent to the CLASS set.

FEATURE DESCRIPTION

One of the CLASS features is Calling Number Delivery (CND). The CND feature allows the directory number of the calling party to be displayed on the CLASS terminal of the called party. The DMS uses a Class Modem Resource (CMR) card to transmit the calling number to the CLASS terminal.

When an incoming call requiring CND is detected, the DMS software sends a message to the XMS-based peripheral module (XPM) to indicate that CND is required. A start ringing message is sent to the Line Concentrating Module (LCM), and the LCM starts ringing the called station. The DMS software makes the necessary connections to allow the CMR card to detect the ring/silence interval of the ring cycle. A message is sent to the CMR card telling it to transmit the calling number to the CLASS set. The CMR card allocates a Ring Detector and waits until the ring/silence period is detected. After the ring/silence period is detected, the CMR card deallocates the Ring Detector, and waits for a specified guard time period to expire. When the guard time expires, the CMR allocates a modem and begins to transmit the calling number to the CLASS set. The CMR card sends a message completed indication to the DMS software. When the software receives the message completed indication, it allows the call to proceed.

Ref: FDOC AC0440

Package	NTXA01AA01 CLASS: CALLING NUMBER DISPLAY
Feature set	NETWORKING
Feature	CLASS: MODEM CARD MAINTENANCE
Feature no	F6692

Synopsis

The CLASS Modem Card XPM Diagnostic feature allows the XPM to test both in-service and out-of-service CLASS Modem Resource (CMR) cards.

This feature makes a fault on a CMR card easy to find and minimizes CMR downtime.

Implementation

The diagnostic tests on in-service CMR cards are run on a regular basis by a new CMR audit introduced by this feature. These diagnostic tests can also be initiated using the TST UNIT command at the MAP.

The diagnostic tests run on an out-of-service CMR card are more thorough than the in-service tests because traffic and time are not constraints. These tests are initiated using the TST UNIT command at the MAP.

When the CMR diagnostic tests detect a fault, a PM181 log is generated.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTXA40AA Directory Number (DN) Attributes
- NTXA64AA RES (Residential Enhanced Services) Base
- NTXA82AA CLASS Line Office Data

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature interacts with the following features:

- CLASS CMR Firmware (Diagnostics)
- CLASS Modem Card Resource Management
- CLASS CMR Maintenance

These features work together to perform CMR diagnostics and report the results of the tests.

Restrictions

There are no restrictions on the use of this feature.

Reference

FDOC AG0780

Package	NTXA01AA01 CLASS: CALLING NUMBER DISPLAY
Feature set	NETWORKING
Feature	CLASS: CMR FIREWARE(CALLING NUMBER DELIVERY)
Feature no	F7231

Synopsis

The CLASS CMR Firmware (Calling Number Delivery) feature allows the CLASS Modem Resource (CMR) card to send a calling number to a called party's customer premises equipment.

Implementation

No operating company action is required to implement this feature.

The firmware for Calling Number Delivery (CND) can be divided into the following four components:

- * messaging interface
- * receive resource controller
- * timer controller
- * transmit resource controller

The messaging interface triggers the CMR firmware to start transmitting the calling number.

The receive resource controller chooses the virtual ring detector that the firmware uses during the CND call and indicates which ringing algorithm is to be used.

The timer controller measures the duration of the time-out period after the end of the first ring cycle (guard time) and the duration of the conditioning tone, which is sent before the CND data is sent.

The transmit resource controller assigns the transmit resource to be used during the CND call.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTXA64AA RES (Residential Enhanced Services) Base
NTXA82AA CLASS Line Office Data

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature works with the CLASS Calling Number Delivery and CMR Maintenance features to perform Calling Number Delivery.

Restrictions

The CMR card can handle no more than 64 simultaneous Calling Number Delivery calls.

Reference

FDOC AG1216

Package	NTXA01AA01 CLASS: CALLING NUMBER DISPLAY
Feature set	NETWORKING
Feature	CLASS: CMR FACILITY MAINTENANCE
Feature no	F7240

Synopsis

The CLASS: CMR Maintenance feature allows for testing and fault identification on the CLASS Modem Resource card.

Implementation

This feature changes the OPT_CARD field of Tables LTCINV and RCCINV to allow a CMR card to be datafilled in a spare slot in the LTC or RCC.

The MMI of the PM level of the MAP has been altered to allow the CMR card to be tested as part of the TST command.

This feature creates three logs: PM128, PM180, and PM181. Log PM128 is generated when the CMR card goes out-of-service. Log PM180 is generated when trouble is detected with the CMR card and a reset is being attempted. Log PM181 is generated when the CMR card diagnostic fails.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

This feature applies only to peripherals that support CMR cards.

Reference

FDOC AG1161

NTXA02AA02 Status: LTD CLASS: CUSTOMER ORIGINATED TRACE

NETWORKING :
CUSTOMER ORIGINATED TRACE F6659
CLASS: CUSTOMER ORIGINATED TRACE ENHANCEMENTS F7235

Package	NTXA02AA02 CLASS: CUSTOMER ORIGINATED TRACE
Feature set	NETWORKING
Feature	CUSTOMER ORIGINATED TRACE
Feature no	F6659

FEATURE SYNOPSIS

This feature allows a subscriber to activate a trace of the last call to his telephone set.

The trace generates an output report using the DMS log subsystem. Information about the traced call is made available to the Operating Company, though not to the subscriber who initially activated the trace.

The description of the traced call includes the calling party's directory number and DN suppression status, information relating to call context such as whether the call was out-of-area, and the time the call was received.

FEATURE DESCRIPTION

The Customer Originated Trace (COT) feature is distinct from many other call processing features in that it deals with information pertaining to a disconnected call. Information about this disconnected call is stored in a buffer. The buffer is associated with the subscriber's line and is generally assigned at the time that the COT line option is added. The buffer is updated/overwritten each time the subscriber's line is alerted. Thus only the most recent incoming call can be traced.

To initiate a trace the COT subscriber completes the call to be traced by going on-hook. The subscriber then accesses the COT feature by going off-hook and dialing the COT access code.

After the feature has been entered, the DMS proceeds to examine the contents of the subscriber's buffer and execute the COT output report.

The subscriber who initiated the trace receives one of two announcements. If the trace was complete (all required data was present and valid), the subscriber receives a COT-success announcement. If the trace was incomplete, the subscriber receives a COT-incomplete announcement.

Once the subscriber has received the COT announcement, the call releases in the standard fashion appropriate to a single party RES call.

Ref: FDOC AG0762

Package	NTXA02AA02 CLASS: CUSTOMER ORIGINATED TRACE
Feature set	NETWORKING
Feature	CLASS: CUSTOMER ORIGINATED TRACE ENHANCEMENTS
Feature no	F7235

Synopsis

The Customer Originated Trace (COT) Enhancements feature adds the following improvements to the COT feature:

- * two-level activation procedure
- * COT Operational Measurements (OMs)
- * Automatic Message Accounting (AMA) record generation
- * changes to LINE150 and LINE151 logs

Implementation

The two-level activation procedure is turned-on through datafill in Table RESOFC.

This feature adds a new OM group, COT. The COT OM group contains OM registers which count various activities during the operation of the COT feature.

When the COT feature is added through SERVORD, the line option parameter BILLING_OPTION must be datafilled. If COT AMA is datafilled, a billing record is generated when a subscriber generates a valid trace. If COT NOAMA is datafilled, no billing record is generated.

The LINE150 and LINE151 logs are changed in the following ways:

The ANSWERED field is removed.

A Line Equipment Number (LEN) as a possible calling party has been moved from the LINE150 trace dump to the LINE151 trace dump.

A new reason, NO DN FOR INTRAOFFICE ORIGINATOR, is added to LINE151.

The Call Waiting (CWT) field in LINE150 and LINE151 displays "Y" or "N". If CWT is "Y", a call trace is output in the LINE151 log.

The calling agent field of the LINE151 log displays the name of an incoming trunk, for internode calls, if the calling DN is unavailable.

The NO CCS7 CONNECTIVITY reason in LINE150 and LINE151 is changed to CALLING PARTY ADDRESS NOT DELIVERED.

For LINE150 and LINE151, the uniqueness of the traced DN is determined from the Nature of Address Indicator for calls having CCS7 connectivity, or the intranode equivalent for intraoffice calls.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge

NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTXA64AA RES (Residential Enhanced Services) Base
NTXA82AA CLASS Line Office Data
NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

The announcements used in two-level activation increases the use of digitone receivers and universal tone receivers.

Reference

FDOC AG1151

Package	NTXA11AA01 PATCH ADMINISTRATION & DOWNLOADING VIA X.25
Feature set	ADMINISTRATION
Feature	PATCH DOWNLOADING VIA X.25
Feature no	G0030

FEATURE SYNOPSIS

This feature will allow DMS patch process operations to be performed from a remote node (computer) using Network Operations Protocol (NOP). Using NOP will result in increased speed, reliability of communication and ability for automation over the current method, which is based on ASCII data transmission over an analogue dial up line.

FEATURE DESCRIPTION

This feature provides software on the DMS to support patching operations in order that they can be invoked remotely using NOP. Embodied within NOP are CCITT recommended standards X.409 (Standard Data Representation) and X.410 (Remote Operations) which serve to provide a standard communications environment offering fast and reliable data transfer between the DMS and a remote node over an X.25 connection. Such a link could either be via synchronous modems and a regular dial up line, or by using a public data network such as TELENET or DATAPAC. Existing PATCHER commands DLCHECK, CHECK and INFORM may be invoked from a remote node. This feature will not change the way any of the PATCHER commands perform when invoked from a CI session.

Data is constructed, encoded and sent to the remote node using the existing Remote Operations (RO) service interface mechanism, and will therefore not necessitate any changes to RO service.

Security is attained through the use of dial-back modems and closed user groups on the packet networks. This ensures limited access to the DMS.

Ref: FDOC AG0814

NTXA15AA01 Status: LTD CALL PROGRESS TONES

CALL PROCESSING :
 CCS7-CALL PROGRESS/COMFORT TONE

G0035

Package	NTXA15AA01 CALL PROGRESS TONES
Feature set	CALL PROCESSING
Feature	CCS7-CALL PROGRESS/COMFORT TONE
Feature no	G0035

FEATURE SYNOPSIS

This feature inserts call progress/comfort tones at specific intervals during call setup to inform the subscriber that the Service Switching Point (SSP) call is in progress.

FEATURE DESCRIPTION

Service Switching Point services, such as E800, increase the post dial delay experienced by the subscriber due to the time required to access the service database. Large post dial delays increase the number of subscriber abandons, re-tries, complaints, and SSP service trouble reports.

This feature notifies the caller that the SSP call is in progress by interjecting tones at regular intervals.

This feature provides call progress/comfort tones for the following SSP services: Private Virtual Network, E800, and 800 Plus.

Ref: FDOC AL0810

NTXA20AA01 Status: LTD TOPS MP INTERFACE TO OPERATOR REFERENCE

INTERFACE :
TOPS MP INTERFACE TO OPERATOR REFERENCE DATABASES (ORDB) G0047

Package	NTXA20AA01 TOPS MP INTERFACE TO OPERATOR REFERENCE DATABASE
Feature set	INTERFACE
Feature	TOPS MP INTERFACE TO OPERATOR REFERENCE DATABASES
Feature no	G0047

Synopsis

This feature provides access from the TOPS MP position to a service, reference, or information database.

The interface allows the database to open several windows on the TOPS MP screen to display information to the operator, define the soft keys, and send a directory number (DA) to the called field for outpulsing to the DMS CC.

This interface allows new services such as the following:

- * stock quotes
- * weather information for travelers
- * customized services for hotels
- * coin refund centre
- * airline reservations

Implementation

Five new windows in the TOPS MP environment can be opened, updated, and closed using the ORDB (operator reference data base) protocol. These are overlay windows, part of the Call Processing screen used by toll and assist (TA) and DA billing. The operating company can designate windows as multi-page and use the Page Forward and Page Backward keys. All eight TOPS MP softkeys may be specified by the operating company. The new windows are:

- * Menu/List Panel
- * Form Input Panel
- * Full Screen Panel
- * Block Input Panel
- * Bottom Width Panel
- * Message Status Area

Editing is consistent with TA and DA applications.

Each window supplies a command line that allows unformatted input to the ORDB database. This reduces operator average work time.

ORDB keys include:

- * ORDB enter ORDB, re-enter ORDB
- * Start send input data to ORDB
- * CLD transfer called number from ORDB to TA
- * FWD page forward

- * BWD page backward
- * QUIT exit ORDB
- * ALT/RESET force exit ORDB
- * ALT/ENTER toggle between command line and input field
- * Softkeys defined by ORDB vendors

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA90AA TOPS- MP Terminal Handler High Speed
NTX724AA TOPS Position Controller (TPC) Version I

Activation and Deactivation

ORDB can be accessed from TA and DA. Pressing the ORDV key twice provides access through the main menu. Pressing the ORDB key once followed by a number from the main menu provides direct access. There are various ways to exit an ORDB session. Temporary exit to perform call processing functions during an ORDB session is provided.

Interactions

There is no interaction between ORDB and the DMS-100/200 or between ORDB and DA.

ORDB is a subset of TA.

The HSDA (high-speed data access) driver, the HSDA message handler, and HSDA maintenance are required for TPC (terminal position controller)/ORDB integration.

Limitations

The force position cannot use the ORDB database.

Assistance and in-charge positions cannot supervise the operator's use of the ORDB database.

Reference: FDOC AF1095

Package	NTXA24AA01 EQUAL ACCESS ENHANCED CARRIER TOLL DENIAL
Feature set	EQUAL ACCESS
Feature	EQUAL ACCESS ENHANCED CARRIER TOLL DENIAL
Feature no	G0051

FEATURE SYNOPSIS

This feature denies toll access from a subscriber to up to 21 carriers, and, on a per carrier basis, blocks subscribers' Operator Assisted (OA) calls.

FEATURE DESCRIPTION

The Operating Company can use the Carrier Toll Deny (CTD) line option to deny access from a subscriber's line to up to 21 carriers for Direct Dialed (DD) and 1+NPA=555 calls. These blocked calls are routed to InterLATA Restricted (ILRS) treatment.

This feature adds the field Carrier Toll Deny Operator Assisted (CTDOA) to Table OCCINFO. CTDOA may be specified as either 'Y' or 'N' for each carrier. Specifying 'Y' for CTDOA blocks OA calls to this carrier when the subscriber has the CTD line option applied for this carrier. Specifying 'N' for CTDOA does not block any OA calls to this carrier.

Any IntraLATA call serviced only by the Operating Company is not affected by the CTD feature. This is also true of Corridor calls which are InterLATA but are handled by the Operating Company.

Ref: FDOC AF1098

NTXA26AA01 Status: RTM TOPS INCOMING FEATURE GROUP D SIGNALLING

TOPS AMA :
TOPS INCOMING FEATURE GROUP D SIGNALLING G0055

Package	NTXA26AA01 TOPS INCOMING FEATURE GROUP D SIGNALLING
Feature set	TOPS AMA
Feature	TOPS INCOMING FEATURE GROUP D SIGNALLING
Feature no	G0055

FEATURE SYNOPSIS

This feature allows a DMS-200 TOPS office to collect Feature Group D (FGC) signaling on selected TOPS trunk groups. Three stages of digit signaling information are collected for international calls. Two stages are collected for national calls.

FEATURE DESCRIPTION

Feature Group D signaling is used to convey digit signaling information to Interexchange Carriers (IC). If the FGD signaling originates from an Equal Access End Office (EAE0), calls may be signaled directly to an IC or indirectly by tandeming the call through an Access Tandem (AT).

This feature allows a DMS-200 TOPS office being used as an IC switch, to collect FGD signaling in the format that an EAE0 would signal directly to an IC.

The DMS-200 TOPS office collects the Automatic Number Identification (ANI) and called number stages for domestic calls, and the international routing, ANI, and called number stages for international calls.

To use this feature in a DMS-200 TOPS IC switch, all subscribers known to the IC are datafilled in table DNPIC with the IC as their primary carrier. Calls from subscribers not known to the IC have a carrier chosen from table TOPEATRK.

Ref: FDOC AF1102

NTXA27AA01 Status: RTM EXECUTIVE CONFERENCE

FAST FEATURE-BELL SOUTH :
EXECUTIVE CONFERENCE

G0078

Package	NTXA27AA01 EXECUTIVE CONFERENCE
Feature set	FAST FEATURE-BELL SOUTH
Feature	EXECUTIVE CONFERENCE
Feature no	G0078

FEATURE SYNOPSIS

The Meet-Me feature has been altered in the following ways:
activation codes to lock and unlock access to the conference bridge are provided
the originator can add on new conferees directly.
the Meet-Me conference is expanded in size to 150 conferees.

FEATURE DESCRIPTION

When the Conference Lock feature is activated the conference call is locked to any further entrance.

When the Conference Unlock feature is activated the conference is unlocked so that anyone else who wants to dial into the conference is now able to do so.

The Conference Add-On feature allows any conferee to add on another conferee.

Field SIZE in Table MMCONF is used to define the size of the conference. The number in the SIZE field refers to the number of conferees in the conference.

Ref: FDOC AF1268

NTXA28AA02 Status: LTD TOPS AWT ENHANCEMENTS

TOPS AMA	:	
TOPS AMA ON OPERATOR SEQUENCE CALLS		G0056
AWT	:	
BUSY LINE VERIFY AVERAGE WORK TIME (AWT) ENHANCEMENTS		G0057
SPECIAL VERIFY AVERAGE WORK TIME (AWT) ENHANCEMENT		G0058

Package	NTXA28AA02 TOPS AWT ENHANCEMENTS
Feature set	TOPS AMA
Feature	TOPS AMA ON OPERATOR SEQUENCE CALLS
Feature no	G0056

FEATURE SYNOPSIS

This feature allows Traffic Operator Position System (TOPS) operators to generate multiple Automatic Message Accounting (AMA) billing records when performing multiple call attempts or multiple operator functions for a customer.

FEATURE DESCRIPTION

Calls handled by TOPS operators often require multiple call attempts or access to a special service such as Directory Assistance (DA) before the call is completed. Operating Companies may require that an AMA billing record be produced for each call completion attempt or service performed.

This feature allows the operator to generate as many AMA records as required for a single call.

This capability is provided by defining a Generate AMA (GEN AMA) key at a TOPS-IV position, and by changing the function of the Services (SVCS) key at a TOPS Multiple Purpose (TOPS-MP) operator position.

An office parameter TOPS_GEN_AMA_SET is provided with this feature to specify for which types of calls operators will be able to generate AMA records.

Ref: FDOC AF1103

Package	NTXA28AA02 TOPS AWT ENHANCEMENTS
Feature set	AWT
Feature	BUSY LINE VERIFY AVERAGE WORK TIME (AWT) ENHANCEME
Feature no	G0057

FEATURE SYNOPSIS

This feature minimizes the number of key strokes required of the operator to perform the Busy Line Verification (BLV) function.

FEATURE DESCRIPTION

This feature eliminates the need for the operator to enter the called party digits more than once.

In addition, the selection of billing options is simplified. An automated selection of Charge Class for the BLV service is provided. The base BLV software has been modified to prevent an operator error from resulting in an invalid billing entry.

The key stroke sequence required of the operator to initiate the Operator-Interrupt sequence following the Verification sequence is shortened.

Ref: FDOC AF1120

Package	NTXA28AA02 TOPS AWT ENHANCEMENTS
Feature set	AWT
Feature	SPECIAL VERIFY AVERAGE WORK TIME (AWT) ENHANCEMENT
Feature no	G0058

Synopsis

The Special Verify Average Work Time Enhancement feature reduces the operator Average Work Time (AWT) on calls billed to a third number. to access a second loop.

When billing to a third number, the operator may be required to contact the third party before allowing billing to that number. This feature minimizes the actions required of the operator to obtain verbal authorization when the calling party requests third-number billing. It is estimated that this feature will save at least 1.5 seconds of work time on the verify portion of a bill-to-third call.

This feature also provides the Operating Company with complete and flexible routing control over all bill-to-third authorization calls. Routing does not require operator action.

Implementation

An Operational Measurement (OM) register SPLVRFY in OM group TOPSTRAF counts the number of bill-to-third authorization calls. This register is incremented each time an operator enters the keystrokes that activate this feature.

Routing control for bill-to-third authorization is provided by a tuple SPLVIFY in Table OPRTRANS.

With this feature, an AMA record for the call billed to the third party is generated. If an AMA record for the authorization part of the bill-to-third call is required, the TOPS AMA On Operator Sequence Calls feature may be used to generated an AMA record.

The TOPS Call Processing feature package NTX030CC is necessary for this feature to operate.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation/Deactivation

To use this feature to obtain third-number billing acceptance, the operator keys KP SPL + START on a TOPS 4 position, or Fcnts + 34 + START on a TOPS MP position. If Verify Special is assigned to a customer assignable hard key on the TOPS MP, third-number billing acceptance can be obtained by pressing the Vfy Spl hard key. The third number overwrites the forward number and is displayed as both a special and a forward number. The third number is then outpulsed on the forward port.

Once the third party is reached, the operator requests acceptance for third-number billing. The calling party is also provided with a voice connection to both the operator and the third party. If necessary, the operator may use the SPLIT key function to break the calling party's voice connection.

When the third party provides or denies acceptance of charges, the operator ends the conversation with the third party and terminates the connection. Upon releasing the connection to the third party, the original called number is retrieved and displayed as the forward number. If the third party accepts charges, the operator connects the calling and called parties. If the third party denies charges, the operator requests alternate billing.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

This feature may only be used while the forward port is free. If the operator has already connected a forward party on this call, the operator must key RLS FWD before entering the keystrokes that activate this feature.

When the operator enters the third number as a special number, a query is sent to a database to check the number against the fraudulent special number list and to perform the Billed Number Screening verification. If the operator receives a negative response from the database checks, this feature cannot be used.

The following key functions are disabled while the operator is connected to the third party on the forward port:

- * POS RLS when not preceded by CA CALL
- * ST TMG and CA TMG.

Reference

FDOC AF1121

DMS ALL BCS27 Feature Description Manual	890124
NTXA31AA01 Status: RTM DISA THIRD DIAL TONE - IBN	
FAST FEATURE-BELL SOUTH : DISA THIRD DIAL TONE	G0081
Section B Available Features NTXA31AA01	Page 212

Package	NTXA31AA01 DISA THIRD DIAL TONE - IBN
Feature set	FAST FEATURE-BELL SOUTH
Feature	DISA THIRD DIAL TONE
Feature no	G0081

FEATURE SYNOPSIS

This feature allows Direct Inward System Access (DISA) users to receive dial tone between dialing an access code and dialing the destination digits.

FEATURE DESCRIPTION

The DISA feature allows authorized outside callers to dial from a remote location in the switched network directly into the DMS-100 and gain access to network facilities without attendant intervention.

The caller dials a 7 or 10 digit Public Switched Telephone Network (PSTN) number or an 800 service number which routes the call to the DISA serving office. If an authorization/account code is required, a special dial tone prompts the caller to enter the authorization code. In either case, this is followed by a dial tone indication to proceed with the called number.

Ref: FDOC AF1270

Package	NTXA32AA01 DISTINCTIVE CALL WAITING RINGBACK
Feature set	FAST FEATURE-BELL SOUTH
Feature	DISTINCTIVE CALL WAITING RINGBACK
Feature no	G0082

FEATURE SYNOPSIS

When a call completes to a Meridian Digital Centrex (MDC) or Residential Enhanced Services (RES) line with Call Waiting Terminating (CWT), this feature, when present on the terminating line, indicates to the caller the state of the terminating line. If the terminating line is engaged in a stable two-port call that is available for call waiting, a distinctive audible ringback is returned to the caller. Otherwise, the caller hears standard ringback or busy tone.

FEATURE DESCRIPTION

This feature adds a new line option, Call Waiting Ringback (CWR), to Tables IBNLINES and KSETLINE. The CWR option is added to or deleted from MDC and RES lines through Service Order commands.

When present on the terminating line, CWR indicates to the caller whether the destination is idle or engaged in another call. If the destination is idle, standard audible ringback is returned to the caller. If the destination is engaged in another call, a distinctive audible ringback is returned to the caller.

Ref: FDOC AF1271

NTXA33AA01 Status: RTM MADN RING FORWARD

FAST FEATURES-BELL SOUTH :
MADN RING FORWARD

G0083

Package	NTXA33AA01 MADN RING FORWARD
Feature set	FAST FEATURES-BELL SOUTH
Feature	MADN RING FORWARD
Feature no	G0083

FEATURE SYNOPSIS

This feature provides increased flexibility in the ringing options available to Single Call Arrangement (SCA) Multiple Appearance Directory Number (MADN). This feature allows SCA MADN appearances to ring on a delayed or abbreviated basis, for a total of four ringing options: always ring, never ring, abbreviated, or delayed.

This feature also allows Electronic Business Set (EBS) users to manually 'push' the ringing for an incoming call to the appearances of the MADN designated for delayed ringing.

FEATURE DESCRIPTION

This feature allows the ring alerting associated with a call terminating on a MADN SCA group to initially be applied to one set of appearances of the MADN and then to be forwarded to another set of appearances of the MADN.

Ring forwarding can be activated automatically or manually. When the MADN group is designated for Manual MRF, only manual activation can instigate MRF for that group. When a MADN group has AUTO MRF assigned, MRF can be activated either automatically or manually.

The timer used for AUTO MRF is assigned in datafill for each MADN group which has the AUTO MRF feature, and may be datafilled to be 0, or 12 to 60 seconds.

Ref: FDOC AF1272

NTXA35AA03 Status: LTD NETWORK NUMBER DISPLAY

CALL PROCESSING	:	
NETWORK NUMBER DISPLAY		F6565
NETWORK DIAL PLAN DISPLAY		F7085
NETWORK DISPLAY ENHANCEMENT		F7319

Package	NTXA35AA03 NETWORK NUMBER DISPLAY
Feature set	CALL PROCESSING
Feature	NETWORK NUMBER DISPLAY
Feature no	F6565

FEATURE SYNOPSIS

This feature provides address information of the party/parties across a SS7 network call for POTS and IBN lines. If any party involved in a SS7 network call is equipped with an Electronic Business Set (EBS) with display, the address of the connected party will be shown on the display when available.

The feature is limited to provide the exchange of address information across a SS7 network that is a public network. Address information exchange takes place for a selected number of IBN features only. These features include call waiting, call pick up, three way conference, call transfer and call forwarding.

FEATURE DESCRIPTION

This feature utilizes the SS7 protocol to send address information between exchanges. The call party address can appear in one of the following ways:

- calling party number
- calling party number
- connected number
- redirected number.

The calling party number, the connected number and the redirecting number shares the same format.

In order to provide uniformity across the SS7 network for call party address within North American services, the call party address shall be a 10 digit number.

Five SS7 protocol messages are used to exchange the call party address. These are initial address message (IAM), address complete message, answer message, information message and pass along message.

Call party address exchange shall include the following features:

- party to party call
- call waiting
- call pick up
- three way conference/transfer
- call forwarding.

Package	NTXA35AA03 NETWORK NUMBER DISPLAY
Feature set	CALL PROCESSING
Feature	NETWORK DIAL PLAN DISPLAY
Feature no	F7085

FEATURE SYNOPSIS

This feature formats a calling party number into a form consistent with the called party's dial plan. This reverse translation capability for calling numbers is provided through customer datafill of newly defined translation data tables.

The initial application of this feature consists of improving the existing Electronic Business Set display capabilities by displaying the calling number in a form which is dialable by the user.

FEATURE DESCRIPTION

This feature allows the customer to define a more uniform set of formatting rules based on the dial plan and has the added advantage that the number displayed may actually be used by the subscriber to recall the calling party.

The algorithms which determine the manner in which the calling party number is manipulated for display are defined through the datafill of two new translation tables, DNREGION and DNREVLXLA. Table DNREGION identifies groups of directory numbers belonging to the same region or community of interest, while Table DNREVLXLA provides digit manipulation algorithms based on the various regions defined in Table DNREGION.

These reverse translation tables are flexible enough to support any type of dial plan. Furthermore, they can be used to define algorithms for calls made over the public network as well as any number of private networks which may be supported by the office.

Ref: FDOC AG0981

Package	NTXA35AA03 NETWORK NUMBER DISPLAY
Feature set	CALL PROCESSING
Feature	NETWORK DISPLAY ENHANCEMENT
Feature no	F7319

Synopsis

This feature extends the single node Meridian Business Set Reason Display feature (F7152 NTX108AA) to provide information on redirected calls made between nodes linked by a Common Channel Signaling Number 7 (CCS7) network.

Display of this information alerts both originating and terminating parties of the ongoing status of redirected calls. For example, calls can be redirected by conferencing transfer, call forwarding, or call pickup. Depending on the type of redirection, an appropriate message is displayed, allowing both parties to respond properly to the call.

Implementation

The call redirection information is datafilled by customer group through Table Control.

This feature is activated by setting REASONID = 'CXMSG' in Table REASONS.

This feature requires new tuple OM_CPG in OM group ISUPUSAG.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTX100AA Integrated Blkusiness Networks - Basic (IBN)
NTX106AA IBN - Proprietary Business Set
NTX108AA IBN - Display Features
NTX901AA Local Features I
either NTX041AA CCS7 - MTP/SCCP
or NTX041AB CCS7 - MTP/SCCP (upgrade of NTX041AA)
either NTX167AA CCS7 - Trunk Signaling
or NTX167AB CCS7 - Trunk Signaling (upgrade of NTX167AB)

Activation and Deactivation

The messages for call redirection information are:

* for conference calling (three-way, station-controlled,

meet me, preset and attendant) both the the calling and the called parties receive message CONFERENCE

- * for Call Forward (Call Forward, Universal, Busy, Don't Answer) the calling party receives message FORWARD, the called party receives message CALL FWD, BUSY FWD or NO ANS FWD
- * for Call Pickup: the calling party receives message PICKED UP, the called party receives message PICKUP
- * for other calls: both the calling and called parties receive message NO CALL INFO

Interactions

This feature works with the Network Number Display feature (also included in NTXA35AA) and Network Name Display (F6677 NTXA80AA) to provide complete calling and called party information

Limitations

If the CCS7 network display information is not available to the end office, the Electronic Business Set displays '*****'.

Reference: FDOC AG1255

Package	NTXA36AA01 NETWORK WIDE RING AGAIN
Feature set	SERVICES
Feature	NETWORK WIDE RING AGAIN
Feature no	F6567

FEATURE SYNOPSIS

Ring again allows a user encountering a busy station to queue against that station and be recalled when it becomes idle. If the user accepts the recall, the original call will be set up again automatically.

Network wide ring again will allow implementing this feature accross the network. CCS7 signalling system is used to communicate between the originating and destination node.

FEATURE DESCRIPTION

The following feature requirements have to be met:

- originator line assigned the RAG feature
- originator line must have the network RAG customer group option
- originator and terminator line must belong to the same network customer group
- call to the terminator must be via an ISUP trunk.

A places call to B. B is busy. A activates RAG. The originator switch sends a RAG request message. A response indicating that the request was accepted or rejected will be returned. In case the request is rejected, a negative acknowledgement is given to A if still off-hook. If A is an EBS, the RAG lamp will turn off.

When B becomes idle, its switch will recognize that someone has ragged on this line. A called party free message is sent to the originator. When A's switch receives the called party free message it will check the A's status and if A is available A will be recalled.

NTXA39AA01 Status: LTD MERIDIAN NETWORK ATTENDANT SERVICE

SERVICES	:	
CALLING NUMBER AND NCOS DISPLAY ON ATTENDANT		F6595
NETWORK ATTENDANT BUSY VERIFICATION STATIONS		F6655
NETWORK CAMP-ON-1		F6658
NETWORK ATTENDANT BUSY VERIFICATION STATIONS PHASE 1		F7090
NCOS AND CLID DISPLAY ON AC-II		F7183
NETWORK CAMP-ON II		F7357
NETWORK ATTENDANT CONTROL		F7358
NETWORK ATTENDANT RECALL		F7359
NETWORK CLID AND NCOS DISPLAY INTERACTION WITH 3WC		F7360

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	CALLING NUMBER AND NCOS DISPLAY ON ATTENDANT
Feature no	F6595

Synopsis

This feature displays the originator's calling line identification (CLID) and network class of service (NCOS) at an attendant console (AC) when it receives a call from an IBN line within the same customer group over an ISDN user part (ISUP) trunk. This feature also displays the AUTOVON precedence (AVP) associated with the originator's SCOPE DIAL class of service (SDCOS) for SCOPE DIAL lines.

This feature provides consistent identification of customer group (CG) or NCOS information so that features that depend on this information can work properly in a network environment.

Implementation

New table CUSTNTWK associates a customer group with a network name and defines the predetermined global numeric identification used for a customer group.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTX167AB CCS7 - Trunk Signaling (upgrade of NTX167AA)
 NTXA05AA Scope Dial/ISUP Interworking
 NTX100AA Integrated Business Networks - Basic (IBN)
 NTX270AA New Peripheral Maintenance Package
 NTX601BA Scope Dial Basic Features
 NTX610AA Scope Dial Overseas
 NTX701BA AUTOVON Basic Features
 NTX707AA AUTOVON CCS7 Basic
 NTX844AA IBN/ISUP Interworking
 NTX167AA CCS7 - Trunk Signaling (upgraded by NTX167AB)
 either NTX041AA CCS7 - MTP/SCCP
 or NTX041AB CCS7 - MTP/SCCP (upgrade of NTX041AA)
 either NTX801AA Toll Features I
 or NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

This feature provides network CLID and NCOS display only when end-to-end ISUP signaling is present.

This feature does not display the CLLI of an AUTOVON four-wire set when it terminates on an AC at another node over an ISUP trunk.

Reference: FDOC AD0360

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NETWORK ATTENDANT BUSY VERIFICATION STATIONS
Feature no	F6655

FEATURE SYNOPSIS

This feature allows an attendant to interrupt a conversation on a busy station.

FEATURE DESCRIPTION

To use this feature the attendant presses an idle loop key and the busy verification lines (BLV) key. The attendant then enters the directory number to be busy verified.

If the line is busy, the attendant breaks into the conversation and requests the parties to hang up. If the line is idle, the attendant may ring the line by pressing the signal source key. If the line is out of order, the attendant receives reorder tone.

Ref: FDOC AD0388

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NETWORK CAMP-ON-1
Feature no	F6658

Synopsis

This feature allows an attendant to camp-on a subscriber on any node within the attendant's network. This means that the attendant can queue an incoming call to a busy station in the attendant's customer group.

During camp-on the caller hears either music or silence. The camped-on call is connected if the called party goes on hook or flashes. The attendant is recalled by the Network Attendant Recall feature if the call is not answered within a predefined time period. If the terminating DMS node cannot implement camp-on, it rejects the message and sends a REL message with cause of rejection to the attendant.

Implementation

Each node within the attendant's network must be provisioned with appropriate CCS7 hardware and software and must be connected to the CCS7 network.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation and Deactivation

The calling party can activate the NAR feature by flashing.

The calling party can cancel camp-on by going on-hook.

P-phones use the three-way calling key to connect to a camped-on party.

Interactions

Camp-on takes precedence over CFB (Call Forward Busy).

CFU (Call Forward Universal), CFI (Call Forward Intragroup) and CW (Call Waiting) take precedence over camp-on.

Any flash features such as three-way calling, are deactivated during camp-on.

If the following features are active, camp-on cannot be used:

- * DND
- * RAG
- * MCH miscellaneous call-hold
- * ESB emergency service bureau
- * ESL emergency service line; if the called party is attached to ESL

For called parties with the call hold feature, the call hold access code must be used to receive camped-on calls.

Attendant Call Park can only be used after pressing the RLS or DEST key.

Camp-on with Tone is not compatible with stations that have NDC (No Double Connect) assigned.

CLF (Calling Line Feature) does not receive the camp-on indicator tone; when the called party goes off-hook, the caller must ring again.

Limitations

This feature does not handle feature interactions, displays, or error conditions.

The attendant must remain with the call.

The Recall feature is not included.

Incoming calls must be from outside the customer group.

The destination must be busy to allow a call to camp-on.

Reference: FDOC AD1153

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NETWORK ATTENDANT BUSY VERIFICATION STATIONS PHASE
Feature no	F7090

Synopsis

Busy-verification-line (BVL) allows an attendant to interrupt a station while it is involved in a conversation. This feature extends the existing BVL feature to include activation on the same customer group in the network but a different switch.

Implementation

NTX3X68AC circuits are required in the remote switch. The BVL option is datafilled in table FNMAP. BVTONE must be added to table CLLI for the busy verification tone circuit.

The location of the tone circuits is specified in table STN for the remote switch.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTX167AB CCS7 - Trunk Signaling (upgrade of NTX167AA)
 NTXA05AA Scope Dial/ISUP Interworking
 NTX100AA Integrated Business Networks - Basic (IBN)
 NTX270AA New Peripheral Maintenance Package
 NTX601BA Scope Dial Basic Features
 NTX610AA Scope Dial Overseas
 NTX701BA AUTOVON Basic Features
 NTX707AA AUTOVON CCS7 Basic
 NTX844AA IBN/ISUP Interworking
 NTX167AA CCS7 - Trunk Signaling (upgraded by NTX167AB)
 either NTX041AA CCS7 - MTP/SCCP
 or NTX041AB CCS7 - MTP/SCCP (upgrade of NTX041AA)
 either NTX801AA Toll Features I
 or NTX901AA Local Features I

Activation and Deactivation

To use this feature, the attendant presses an idle loop key, a BVL key, then the DN . The release key is used to exit the feature at any time. Before the operator interrupts the call, the two parties receive two seconds of BV tone. If the line is out of order, the attendant receives re-order tone.

Interactions

All flash features of a user being busy verified are ignored.

All of the attendant's feature keys, except night service and position busy are ignored during BVL.

Hunting on hunt lines does not occur during BVL.

Call forward universal takes precedence over busy verification.

Limitations

The attendant can only interrupt a two-port call.

The customer should maintain a consistent dialing plan so that the attendant can reach the line.

Reference: FDOC AD0361

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NCOS AND CLID DISPLAY ON AC-II
Feature no	F7183

FEATURE SYNOPSIS

This feature allows the Attendant Console to display the calling line identification (CLID) and network class-of-service (NCOS) of an incoming call from any node within the attendant's network.

FEATURE DESCRIPTION

This feature displays the CLID and NCOS of the originator on
Attendant Console held calls
DISA calls
Forwarded calls that terminate on an AC
Interposition calls
Attendant call park calls
Attendant camp-on calls

Ref: FDOC AD1154

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NETWORK CAMP-ON II
Feature no	F7357

Synopsis

This feature notifies the attendant if network camp-on is possible on attendant-extended calls over ISUP trunks. The connection to the terminating DMS node is maintained during camp-on.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX167AB CCS7 - Trunk Signaling (upgrade of NTX167AA)
NTXA05AA Scope Dial/ISUP Interworking
NTX100AA Integrated Business Networks - Basic (IBN)
NTX270AA New Peripheral Maintenance Package
NTX601BA Scope Dial Basic Features
NTX610AA Scope Dial Overseas
NTX701BA AUTOVON Basic Features
NTX707AA AUTOVON CCS7 Basic
NTX844AA IBN/ISUP Interworking
NTX167AA CCS7 - Trunk Signaling (upgraded by NTX167AB)
either NTX041AA CCS7 - MTP/SCCP
or NTX041AB CCS7 - MTP/SCCP (upgrade of NTX041AA)
either NTX801AA Toll Features I
or NTX901AA Local Features I

Activation and Deactivation

The attendant attempts to extend the call by dialing the station number. If the attendant receives a TRY CAMPON message the attendant can ask the caller if camp-on is requested. Camp-on is activated through the auto-hold feature using a loop key. The caller hears silence or music during camp-on. The camped-on call is connected if the called station goes on-hook or flashes.

If a camped-on call is not answered within a specified time, the attendant is recalled automatically. The camped-on caller can recall the operator by flashing. Camp-on can be cancelled by pressing the RLS SRC or RLS DEST key.

BUSY, CAMPON CKTS BSY and CAMPON FAIL messages indicate if camp-on is not possible.

Interactions

Camp-on takes precedence over call forward busy.

Call waiting, call forward universal, and call forward intragroup take precedence over camp-on.

Three-way calling and malicious call hold are disabled during camp-on.

When do not disturb or malicious call hold are active, a call cannot be camped-on.

Camp-on is not possible to calls connected to an emergency service line or an emergency service bureau.

The attendant must flash and dial the call hold access code to camp-on to a station with call hold assigned.

The three-way calling key is used on EBS/ETS/IVD sets to connect the camped-on party.

Calling line with flash (CLF) stations do not hear the camp-on tone. When they go on-hook, the calling party must re-dial the call.

Limitations

The called party must be in the same customer group as the attendant.

Camp-on with tone is not compatible with stations that have no double connect (NDC) assigned.

Attendant console CFB (ACCFB) is not supported with camp-on.

The originating, terminating, and attendant switches must be DMS nodes with BCS27 or more recent software. No interworking can be encountered.

Reference: FDOC AD1518

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NETWORK ATTENDANT CONTROL
Feature no	F7358

Synopsis

This feature prevents a called party from disconnecting a call from an attendant console (AC) if the called party is in the same customer group.

The attendant control feature is extended to allow the attendant control calling and called parties to be on different switches as long as they are in the same customer group.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX167AB CCS7 - Trunk Signaling (upgrade of NTX167AA)
NTXA05AA Scope Dial/ISUP Interworking
NTX100AA Integrated Business Networks - Basic (IBN)
NTX270AA New Peripheral Maintenance Package
NTX601BA Scope Dial Basic Features
NTX610AA Scope Dial Overseas
NTX701BA AUTOVON Basic Features
NTX707AA AUTOVON CCS7 Basic
NTX844AA IBN/ISUP Interworking
NTX167AA CCS7 - Trunk Signaling (upgraded by NTX167AB)
either NTX041AA CCS7 - MTP/SCCP
or NTX041AB CCS7 - MTP/SCCP (upgrade of NTX041AA)
either NTX801AA Toll Features I
or NTX901AA Local Features I

Activation and Deactivation

The attendant rings a party under network attendant control by pressing the SIGNAL SRC or SIGNAL DST key on the AC. The attendant releases the party by pressing the RELEASE SRC or RELEASE DST key.

The call is taken down if it goes on-hook while extended by the AC or while in the recall queue. If the party goes on-hook while under network control, the AC displays the message SRC ON-HOOK. If the party (source) then goes off-hook, the AC displays the message SRC OFF-HOOK. For extended calls, the AC displays the messages DST ON-HOOK or DST OFF-HOOK if the ex-

tended party (destination) goes on- or off-hook during network attendant control.

The billing period includes the duration of attendant control even if the party went on-hook.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Network control does not apply if AC floats the call.

If both parties are ACs, network attendant control does not apply.

The AC display is not updated while this feature is in effect.

This feature only applies to IBN lines in the same CG as the AC that are connected to the AC by ISUP trunks.

Reference: FDOC AD1521

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NETWORK ATTENDANT RECALL
Feature no	F7359

Synopsis

This feature works with IBN, POTS, and AUTOVON ISUP trunks. It provides network attendant recall over an ISUP trunk for:

- * no answer recall: the console extends a call to an idle line, in the same customer group (CG), that does not answer
- * attendant camp-on or call wait recall: the console extends a call to a busy line in the same CG and call waiting or attendant camp-on applies
- * source flash recall: the console extends a call to a line that does not answer and the source wants to recall back to the console

This feature allows the operating company to activate the No Answer Recall timer when the attendant extends a call to a three-way call.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTX167AB CCS7 - Trunk Signaling (upgrade of NTX167AA)
 NTXA05AA Scope Dial/ISUP Interworking
 NTX100AA Integrated Business Networks - Basic (IBN)
 NTX270AA New Peripheral Maintenance Package
 NTX601BA Scope Dial Basic Features
 NTX610AA Scope Dial Overseas
 NTX701BA AUTOVON Basic Features
 NTX707AA AUTOVON CCS7 Basic
 NTX844AA IBN/ISUP Interworking
 NTX167AA CCS7 - Trunk Signaling (upgraded by NTX167AB)
 either NTX041AA CCS7 - MTP/SCCP
 or NTX041AB CCS7 - MTP/SCCP (upgrade of NTX041AA)
 either NTX801AA Toll Features I
 or NTX901AA Local Features I

Activation and Deactivation

To the attendant, there is no difference between nodal recall and network recall with this feature. An attendant may answer a recall from a three-way call.

Interactions

A flash from a call that is not involved in a flash activated feature such as conference call, call waiting, or call request is interpreted by the system as flash recall. A flash from the source of a conference call is interpreted by the system as a three-way call action.

This feature allows recall if there is a three-way call on the source.

The attendant activates the No Answer Recall timer by holding or releasing a three-way call when the third party does not answer. The call is queued to the attendant when the timer expires. If the controller of the three-way call goes on-hook, the timer remains active and a flash is interpreted as recall to the attendant.

Limitations

This feature functions only on ISUP equipped switches.

Network attendant call park is not part of this feature.

This feature does not support recall interaction with interposition calling.

Reference: FDOC AD1523

Package	NTXA39AA01 MERIDIAN NETWORK ATTENDANT SERVICE
Feature set	SERVICES
Feature	NETWORK CLID AND NCOS DISPLAY INTERACTION WITH 3WC
Feature no	F7360

Synopsis

This feature displays calling line and network class of service (NCOS) at the attendant console (AC) when an agent in a three-way call involving an ISUP trunk is transferred to the attendant.

A third line is added to the attendant console display to provide this information for ISUP trunks.

Implementation

All displays, with the exception of 3 WAY CALL message, are the same as existed before this feature. The 3 WAY CALL message is displayed when the third party is conferenced in with the attendant. The display message REMOTE AC CNCTD in place of the CLID indicates that a remote attendant is involved in the network call.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX167AB CCS7 - Trunk Signaling (upgrade of NTX167AA)
NTXA05AA Scope Dial/ISUP Interworking
NTX100AA Integrated Business Networks - Basic (IBN)
NTX270AA New Peripheral Maintenance Package
NTX601BA Scope Dial Basic Features
NTX610AA Scope Dial Overseas
NTX701BA AUTOVON Basic Features
NTX707AA AUTOVON CCS7 Basic
NTX844AA IBN/ISUP Interworking
NTX167AA CCS7 - Trunk Signaling (upgraded by NTX167AB)
either NTX041AA CCS7 - MTP/SCCP
or NTX041AB CCS7 - MTP/SCCP (upgrade of NTX041AA)
either NTX801AA Toll Features I
or NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AD1525

NTXA40AA02 Status: RTM DIRECTORY NUMBER (DN) ATTRIBUTES

CALL PROCESSING	:	
DN NETWORK ATTRIBUTES		F6529
ENHANCEMENT	:	
DN ATTRIBUTES SERVICE ORDER ENHANCEMENT		F7084

Package	NTXA40AA02 DIRECTORY NUMBER (DN) ATTRIBUTES
Feature set	CALL PROCESSING
Feature	DN NETWORK ATTRIBUTES
Feature no	F6529

FEATURE SYNOPSIS

This feature allows the Operating Company to datafill station information against a directory number (DN) on a network basis.

Information stored against the DN includes:

- The address employed within the network to identify the station.
- Whether the station can be addressed directly via the DN.
- An associated name for future use with display terminals, and
- A suppression parameter indicating whether or not the line identification information is allowed to be displayed.

The feature is optional. It is required for line identification and display features in a fully networked environment.

FEATURE DESCRIPTION

Calls which can be completed within a single office have easy access to data describing the parties involved in the call. This information is essential for invoking many customer features such as line identification display and ring again. When a call is routed inter-office, the necessary information is unavailable, and these features are disabled.

However, with the advent of high level signalling protocols, such as CCS7 and ISDN Primary Rate Access (PRA), it becomes both desirable and feasible to exchange this sort of information between offices, thereby providing access to these features network wide.

The identity of a station involved in a call is given by that station's DN. This DN can be a public number associated with the station, or any one of a number of private DNs used to address the station. Ideally this DN uniquely identifies the station for the purpose of remote feature activation, such as network ring again. Unfortunately, this is not always possible, as in the case of stations without Direct Inward Dialing (DID).

It therefore becomes necessary to store information about a station's identity and characteristics on a logical network basis within each office. A means for determining the logical network for a given call must also be defined. This feature is responsible for providing these capabilities.

Package	NTXA40AA02 DIRECTORY NUMBER (DN) ATTRIBUTES
Feature set	ENHANCEMENT
Feature	DN ATTRIBUTES SERVICE ORDER ENHANCEMENT
Feature no	F7084

FEATURE SYNOPSIS

This feature improves the following systems:
SERVORD (SERvice ORDER)
TRAVER (TRAnslation and routing VERification)

FEATURE DESCRIPTION

For SERVORD the following changes are made:
DN network attributes can be assigned against a single DN
DN network attributes can be assigned against a group of DNs
DN network attributes can be queried to determine the status, working or unassigned, of DNs and LENS associated with lines.

TRAVER is changed to show DN network attributes information. Information about DN network attributes will be displayed for lines that can originate and/or terminate on a switching office.

Ref: FDOC AG0923

Package	NTXA41AA01 CLASS: CALLING NUMBER DELIVERY BLOCKING ADMINISTRATION
Feature set	NETWORKING
Feature	CLASS: CALLING NUMBER DELIVERY BLOCKING ENHANCEMENT
Feature no	F7237

Synopsis

The Calling Number Delivery Blocking feature allows a calling party to control the display of his directory number (DN) to the called party, on a per call basis. If the calling number is usually displayed, the caller may choose not to display it. If the calling number is usually not displayed, the caller may choose to display it.

Implementation

Calling Number Delivery Blocking implements DN suppression control for an individual call only.

A number of other levels of DN suppression control exist. DN suppression can be controlled for an office, a group of DNs, an individual DN, or an individual call. A calling party's DN has a default suppression status based on the line and group levels of suppression control. A default status of "suppressed" means that the calling party's DN is not displayed to the called party. A default status of "unsuppressed" means that the calling party's DN is displayed to the called party.

Activating the CNDB feature changes the suppression status of the DN for the current call from the default status to its opposite.

The calling party's default DN suppression status is reinstated for all subsequent calls until CNDB is activated again.

This feature adds a new field to Table RESOFC to datafill a CNDB confirmation announcement. The announcement is an indication that CNDB activation has occurred, but does not indicate the resulting suppression status.

A new line option, CNDB, is provided. This line option can be added to or deleted from a line using existing Service Order commands.

This feature adds a new Operational Measurement (OM) group, CNDB, to indicate the behavior of the CNDB feature.

AMA billing records are generated for successful CNDB activations if the SUSP parameter in Table AMAOPTS is turned ON and the AMA billing option for CNDB has been placed on the line.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTXA64AA RES (Residential Enhanced Services) Base
NTXA82AA CLASS Line Office Data
NTX901AA Local Features I

Activation/Deactivation

The calling party changes his suppression status from the default status for the current call by going off-hook, obtaining dial tone, and dialing the CNDB access code.

The subscriber receives one of the following:

- * an announcement followed by recall dial tone, if an announcement is supplied by the Operating Company
- * recall dial tone only, if an announcement is not supplied by the Operating Company.

The calling party then dials the called number.

Interactions

A calling party can activate both CNDB and Automatic Call Back (ACB) for the same call. CNDB must be activated first, then ACB.

A calling party can activate Automatic Recall (AR) in the same call as CNDB. CNDB must be activated first, then AR.

A calling party can use CNDB to control DN display to the third party of a three-way call. The calling party activates CNDB, then dials the third party's number.

A calling party can use CNDB to control the display of his DN when transferring a call to a third party. The calling party activates CNDB first, then dials the third party's number.

All other originating line features normally available to RES lines can be used on calls with CNDB activated.

CNDB can work with Call Forward Don't Answer (CFD). If the CNDB access code is not dialed before the call, the calling party's default suppression status is used at the remote station. If CNDB is activated before the call, the opposite of the calling party's default suppression status is used at the remote station.

CNDB and any of the other call forwarding features can be assigned to the same RES line.

Restrictions

The CNDB line option is available only for RES lines.

The following RES line options cannot be used with CNDB:

- * Denied Origination
- * Automatic Line
- * Multiple Appearance DN.

Reference

FDOC AG1155

Package	NTXA43AA01 CALL FORWARD REMOTE ACTIVATION
Feature set	STATION FEATURES
Feature	CALL FORWARD REMOTE ACTIVATION
Feature no	F2781

Synopsis

This feature permits call forwarding universal subscribers to activate, change, or deactivate call forwarding by dialing a number to their local central office from any location.

Implementation

Call forwarding remote access (CFRA) is activated by adding it as an option in SERVORD. The authority code is automatically entered in table AUTHCDE when the option is assigned.

If activation or deactivation is successful, log AMAB117, billing code 31, and CFW101 journal file log are generated.

Tables affected by this feature are: AUTHPART, AUTHCDE, CUSTSTN, IBNFPEAT, IBNXLA, KSETFEAT, WRDN, ANNS, ANNMEMS, DRMUSERS. Datafill requirements are explained in DDOC BR0781.

New OM group CFRA records feature usage and failures.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA64AA RES (residential Enhanced Services) Base
NTX100AA Integrated Business Networks - Basic (IBN)

Activation and Deactivation

The caller dials a direct inward system access (DISA) DN to activate or deactivate CFRA. The caller receives an announcement prompting for the base station DN and personal identification number, the feature access code, and the call forwarding number. The system checks for errors at each step.

If the base station has speed calling short list or speed calling long list, the caller can enter a cell number. The contents of the cell are used as the forward to number. The number is played back to the caller during the verification announcement.

Interactions

The remote access features that may be associated with the DISA DN are: call forward remote access, private virtual network access, DISA dialplan access.

This feature is not compatible with call forwarding usage sensitive pricing.

This feature cannot remotely access call forward busy or call forward don't answer.

Limitations

When this feature is active, call waiting on the remote station is denied and the remote station cannot flash to initiate a three-way call.

CFRA can only be given to a line to which CFX has been assigned.

If the remote access call is inter-nodal, there is no check for feature interactions on the remote station.

If the remote access call is intra-nodal, the remote station must be a DGT line.

Extra program store and data store are required in offices that do not have tables AUTHPART and AUTHCDE.

Extra DGT receivers are required by this feature. A UTR is used if the XPM is equipped with UTRs.

One FDB and one FCB are required per CFRA call.

Reference: FDOC BR0781

DMS ALL BCS27 Feature Description Manual		890124
NTXA52AA01	Status:	A+M ACD REMOTE LOAD MANAGEMENT(UPG.BY NTXA52
LOAD MANAGEMENT	:	
REMOTE ACD LOAD MANAGEMENT		F6517
Section B Available Features		NTXA52AA01
		Page 252

Package	NTXA52AA01 ACD REMOTE LOAD MANAGEMENT(UPG.BY NTXA52AB)
Feature set	LOAD MANAGEMENT
Feature	REMOTE ACD LOAD MANAGEMENT
Feature no	F6517

FEATURE SYNOPSIS

This feature allows processing of Load Management (LOADMGMT) commands that are originated from a Remote Operating (RO) Down Stream Processor (DSP).

FEATURE DESCRIPTION

This feature provides a DSP with the capability of issuing ACD LOADMGMT commands remotely. The remote operation (RO), DSPREQUESTLOADMGMT will allow the following types of commands to be executed:

- Reassign Agent Position
- Reassign ACD Directory Number
- Change Maxwait
- Change Maxqsize
- Change Threshold Route
- Change Night Service Route
- Change Enhanced Overflow Routes
- Change ACD Directory Number Priorities
- Change Audio Group
- Change Recorded Announcement Threshold

If the ACD LOADMGMT function succeeds, then a Return Result will be sent to the DSP. If the command fails, than a Return Error will be sent to the DSP informing it of the error.

Ref: FDOC - AD0826

NTXA52AB01 Status: RTM ACD REMOTE LOAD MANAGEMENT I (UPG. OF NT

ACD	:	
REMOTE ACD SHOW		F6516
LOAD MANAGEMENT	:	
REMOTE ACD LOAD MANAGEMENT		F6517

Package	NTXA52AB01 ACD REMOTE LOAD MANAGEMENT I (UPG. OF NTXA52AA	IN
Feature set	ACD	
Feature	REMOTE ACD SHOW	
Feature no	F6516	

FEATURE SYNOPSIS

This feature implements new remote operations (ROs) to give the the Down Stream Processor (DSP) more capabilities to access information from a remote location.

FEATURE DESCRIPTION

This feature provides the following:

Remote operations to send audio and route information during initialization
ACDSHOW remote operations
ACDMIST test tool enhancements for testing new remote operations.

Initialization Remote Operations

Five new initialization remote operations are implemented by this feature. These ROs are transmitted from the DMS to the Down Stream Processor during initialization.

ACDSHOW Remote Operation

Two ACDSHOW functions are implemented by this feature. If the ACDSHOW function succeeds, a Return Result is sent to the DSP. If the command fails, a Return Error is sent to the DSP informing it of the error.

ACDMIST Enhancements

The ACDMIST CI is changed to test the ACDSHOW remote operations. The BUILDRO command has been changed to accept initialization ROs and to send remote ACDSHOW requests.

Ref: FDOC AD0825

Package	NTXA52AB01 ACD REMOTE LOAD MANAGEMENT I (UPG. OF NTXA52AA IN
Feature set	LOAD MANAGEMENT
Feature	REMOTE ACD LOAD MANAGEMENT
Feature no	F6517

FEATURE SYNOPSIS

This feature allows processing of Load Management (LOADMGMT) commands that are originated from a Remote Operating (RO) Down Stream Processor (DSP).

FEATURE DESCRIPTION

This feature provides a DSP with the capability of issueing ACD LOADMGMT commands remotely. The remote operation (RO), DSPREQUESTLOADMGMT will allow the following types of commands to be executed:

- Reassign Agent Position
- Reassign ACD Directory Number
- Change Maxwait
- Change Maxqsize
- Change Threshold Route
- Change Night Service Route
- Change Enhanced Overflow Routes
- Change ACD Directory Number Priorities
- Change Audio Group
- Change Recorded Announcement Threshold

If the ACD LOADMGMT function succeeds, then a Return Result will be sent to the DSP. If the command fails, than a Return Error will be sent to the DSP informing it of the error.

Ref: FDOC - AD0826

NTXA60AA01 Status: RTM TOPS CLOSEDOWN(REPLACES NTX134BB AND NTX

ADMINISTRATION	:	
OPERATOR CENTRALIZATION - REMOTE		F1317
TOPS	:	
REMOTE ONI VIA O.C.		F2602
ADMINISTRATION	:	
TOPS CLOSEDOWN		F2605

Package	NTXA60AA01 TOPS CLOSEDOWN(REPLACES NTX134BB AND NTX039AB)
Feature set	ADMINISTRATION
Feature	OPERATOR CENTRALIZATION - REMOTE
Feature no	F1317

FEATURE SYNOPSIS
-----FEATURE DESCRIPTION

OC (Operator Centralization) is a feature which allows a single DMS TOPS switch (the HOST) to provide operator services for several remote DMS Toll Switches (the REMOTES). Communication between the Host and the Remotes is by means of digital data links (2 for reliability) and digital or analog voice links (provisionable).

The facilities/functions which are provided at the Remote are:

- a. Operator calls recognition - recognize the need for operator assistance on the basis of trunk type (dedicated call type or station type or travelling class marks contained in received digits).
- b. Communication with Host - forward all pertinent information to the HOST via data channels in a call arrival message.
- c. Rating system - send rating results to the HOST for display to operator.
- d. AMA recording - generate AMA records based on pertinent operator keying input received over the data link.
- e. Hotel administration system - Generate voice quote and/or Autoquote printer messages.
- f. Trouble reporting system - generate trouble report messages based on operator input while pertinent call is connected to the operator. Route to appropriate printer.
- g. Operational Measurement - provide OM for the operator Centralization data and voice links.

It is to be noted that a Remote switch will not support RONI trunks. All RONI services for an OC configuration must be provided using RONI trunks terminating on the Host.

Package	NTXA60AA01 TOPS CLOSEDOWN(REPLACES NTX134BB AND NTX039AB)
Feature set	TOPS
Feature	REMOTE ONI VIA O.C.
Feature no	F2602

FEATURE SYNOPSIS

Remote Operator Number Identification (RONI) is provided on an office equipped with the operator centralization (OC) remote package.

FEATURE DESCRIPTION

This feature will make RONI compatible with the OC environment as well as standalone.

The method applied here is the concept of gating. Instead of duplicating everything for each environment a 'gate' is added in common code to access environmental specific functions.

The two environments in TOPS are:

- stand alone
- centralized

A table is set up to be indexed by environment and the type of function to be performed.

Package	NTXA60AA01 TOPS CLOSEDOWN(REPLACES NTX134BB AND NTX039AB)
Feature set	ADMINISTRATION
Feature	TOPS CLOSEDOWN
Feature no	F2605

FEATURE SYNOPSIS

The OC night closedown feature provides the ability for telcos to close down and reopen a TOPS operator centralization (OC) rest office or a stand alone office at specified times of the day. When closed down, the host will function as a remote to another TOPS office. Remotes off that host will switch to the new host office.

FEATURE DESCRIPTION

Operator centralization provide the ability for many remote offices to share the operator positions at one host office. This is accomplished by communication links between the remote offices, where the calls originate, and the host offices where the position resides. The links are of two types - data links and voice links.

Operator centralization software is divided to accomplish the tasks within its particular environment, host or remote. In table OFCENG with TOPS_OC_ENVIRONMENT parameter unitializes the specified environment.

Five data tables (OCHOST, OCOFC, OCGRP, TOPSHDLC, VLMEM), which provide communication link information, are utilized by OC. Each table exists in both remote and host environments except for table OCHOST which is only present in the remote

Modes of Operation:

Auto mode provides the ability for the TOPS network to automatically change to its nighttime configuration (closed) and then back to the daytime configuration (open) at user specified times. Each switch which is to alter its traffic must be instructed when to close, when to reopen and which host will service its traffic when closed. Once activated these changes will occur automatically everyday.

Manual mode provides the ability to command a switch to immediately change to its nighttime configuration or to immediately return to its daytime configuration. This mode also allows the parameters necessary for activation of auto mode to be specified. The times at which a switch is to automatically close, when it is to reopen and the host which will service its traffic when closed may only be designated or altered in manual mode.

Interoffice Coordination:

If a closing host has subtending remotes, the remotes shoudl be redirected before the host is closed. When redirecting remote offices or closing

host and stand alone offices, the administration must ensure sufficient manned position at the new host to handle the additional traffic volume. When reopening a closed host, the host should be reopened and staffed before the remotes are brought back.

This feature will accomplish the TOPS OC network changes when closing and opening by providing the following capabilities:

1. Conversion of a host switch to a remote switch.
2. Conversion of a remote switch back to a host switch.
3. Redirection of a remote's operator traffic to the OCNC host.
4. Redirection of a remote's operator traffic back to its original host.
5. Automatic performance of 1, 2, 3 and 4 at user specified times.
6. Manual performance of 1, 2, 3 and 4 when instructed by the user.
7. Provide status of the feature.
8. Assistance position calls.
9. Mechanized credit card service queues.

Ref: AF0040

NTXA62AA01 Status: LTD TOPS MP DA/AUDIO RESPONSE

CALL PROCESSING	:	
TOPS MP INTERNAL/EXTERNAL ARU MESSAGE ROUTING		F6531
TOPS MP FORCE MANAGEMENT DATAFILL AND OMS		F6952
TOPS MP DA/INT CALL PROCESSING		F6953
TOPS MP ARU CALL PROCESSING		F6956

Package	NTXA62AA01 TOPS MP DA/AUDIO RESPONSE
Feature set	CALL PROCESSING
Feature	TOPS MP INTERNAL/EXTERNAL ARU MESSAGE ROUTING
Feature no	F6531

Synopsis

This feature provides the DMS-200 switching system with software that supports the selection of and connection with an audio response unit (ARU). The ARU automatically quotes directory assistance (DA) information. The feature supports both an NT internal ARU and external ARU. The feature also provides messaging with a DA system (DAS).

Implementation

New log TCCI100 informs the craftsperson that an error occurred in the messaging between the DMS and the DAS.

New table SERVICES is used to indicate the protocol and the datalink type for DA service.

New table ARUMEMBR is used to associate a TOPSARU trunk member with a DAS trunk ID. TOPSARU is a new trunk group type that handles the external ARU.

New table XANNINFO is used to check whether a call can be connected to an operator when an ARU announcement is over.

New table ARURTE contains announcement-specific ARUs.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge

NTX001AA Common Basic

NTX273AA Multi-Protocol Controller BX.25

NTX801AA Toll Features I

either NTX030CATOPS Call Processing Features (upgraded by NTX030CB)

or NTX030CB TOPS Call Processing Features (upgraded by NTX030CC)

or NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

A DA can be presented in one of the following ways:

- * dialed digits: 411, 555-1212, NPA-555-1212
- * operator keying SERVICES DA followed by START from TOPS multi-purpose position
- * over dedicated DA trunks

The operator uses Automatic Voice Response to quote the information to the customer.

At the end of the announcement, the customer can remain off-hook and be connected to an operator.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

This feature requires MPC datalinks for messaging between the DMS and the DAS.

For external ARUs, the new TOPSARU trunks must be analog four-wire E and M trunks entering the DAS ARU center.

A TOPSARU trunk must have a direction of outgoing and the outpulsing type must be "No Pulse".

An entry must be datafilled in table TRKGRP before it is datafilled in table ARUMEMBR.

The maximum number of entries in table ARUMEMBR is 16.

All entries in table ARUMEMBR must be TOPSARU trunks. DDOC AF0739 contains further datafill requirements for tables ARUMEMBR and SERVICES.

Reference: FDOC AF0739

Package	NTXA62AA01 TOPS MP DA/AUDIO RESPONSE
Feature set	CALL PROCESSING
Feature	TOPS MP FORCE MANAGEMENT DATAFILL AND OMS
Feature no	F6952

Synopsis

This feature improves FADS (force administration data system) by allowing force managers to designate the type of service an operator may handle. This provides the operating company with the flexibility to configure individual traffic offices within a FADS as TA (toll and assist), DA (directory assistance), or a combination of the two.

New operational measurements (OMs) are provided for DA service.

Implementation

Table OPRDAT (operator data) can now contain the service profile for each operator in field SVCSET. Values for SVCSET are: 'TASERV', 'DASERV', 'ALL'.

Table TOPSPOS (TOPS position) now contains the service capability set of each operator, and each ASST and IC position. New field SVCSET can take the following values: 'TASERV', 'DASERV', 'ALL'. Field XFRSET now includes entry 'ALL'.

TADS (traffic office administration) and SADS (system administration) TTY commands and responses now allow input of operator service, TA and/or DA.

TADS/SADS TTY commands are used by the TO manager to specify the operator's profile in column SVC. X command now includes service sets in the operator profile. L command now includes operators' service sets in column COMBSVC.

New OM group TOPSDA measures the types of DA and intercept calls which are handled by a TOPS VR system.

New OM group TOPSARU records action in TOPS offices relating to ARUs used to provide DA or intercept information to subscribers.

New OM group DAMISC counts events relating to TOPS DA service.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTX273AA Multi-Protocol Controller BX.25
 NTX801AA Toll Features I

either NTX030CATOPS Call Processing Features (upgraded by NTX030CB)
or NTX030CB TOPS Call Processing Features (upgraded by NTX030CC)
or NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

The addition of service profiles and combined service sets in the FADS commands and new OM groups TOPSDA, TOPSARU, and DALINK are only visible if the DA package is present.

Limitations

Only positions with DA capability should be datafilled with SVCSET = 'DASERV' or XFRSET = 'DA' in table TOPSPOS. The table editor ensures that positions are TOPS MP, but the craftsperson must ensure that these positions have HSDA cards in place.

For regular operators, defined as 'OPR' in table TOPSPOS, the XFRSET must be compatible with the SVCSET in table TOPSPOS.

The table editor used with table OPRDAT should only be used to ADD or DELETE operator numbers from the table.

Reference: FDOC AF0740

Package	NTXA62AA01 TOPS MP DA/AUDIO RESPONSE
Feature set	CALL PROCESSING
Feature	TOPS MP DA/INT CALL PROCESSING
Feature no	F6953

Synopsis

This feature improves TOPS call processing by including directory assistance (DA) call rating based on call type and calling service class. The feature provides:

- * mechanized rating of a DA call based on a call type and calling service class
- * mechanized calling card service (MCCS) billing information for 0+ chargeable DA calls
- * automatic coin toll service (ACTS) billing information for 1+ chargeable DA calls
- * operator-handled DA call completion
- * routing of operator-handled intercept calls to a TOPS multi-purpose position with DA capabilities

Implementation

New table DATRKOPT specifies DA options on a trunk group basis for TOPS, IT and ATC trunk groups.

New table AISCAT matches the ANI ID digit received with one of the intercept call types and specifies the expected number of digits in the ANI spill.

Fields CLGID, CLGRQD and CHGRQD are deleted from table TOPSOIC. The information contained in these fields is now contained elsewhere.

Table DABILL has two new fields. SERVNAME specifies the service name used to rate DA calls using table SRVRS. New field CLGREQ specifies whether calling number is required. CHARGE field is deleted from this table.

Field CLGID in table TRKGRP can now take intercept type signaling "AIS". Field CLGSERV in table OSSCAT can now take new intercept call types.

The operator accesses TA (toll and assist) services by entering "SVCS digit START". The TA screen displays the billing and requested numbers. The call is then processed as a manual DA call completion or a semi-automatic call completion.

0+ DA calls are connected to the MCCS subsystem, which collects and validates the calling card number. The DA screen is then displayed at a TOPS MP position, where the operator collects billing information/.

The ACTS subsystem counts coins for direct dialed prepaid DA coin calls before forwarding the call to a TOPS MP position. A DRAM provides the coin call rating announcement.

Operator-handled intercept calls arrive at a TOPS MP with double call arrival tone and call type "Intercept". The operator enters seven digits of the called number and presses the Intercept Audio key to send the call to an audio response unit (ARU).

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge

NTX001AA Common Basic

NTX273AA Multi-Protocol Controller BX.25

NTX801AA Toll Features I

either NTX030CATOPS Call Processing Features (upgraded by NTX030CB)

or NTX030CB TOPS Call Processing Features (upgraded by NTX030CC)

or NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

This feature does not support :

- * AUTOVON
- * DMS-250
- * Mobile Operator Position System
- * Overseas Operator Center

Reference: FDOC AF0741

Package	NTXA62AA01 TOPS MP DA/AUDIO RESPONSE
Feature set	CALL PROCESSING
Feature	TOPS MP ARU CALL PROCESSING
Feature no	F6956

Synopsis

This feature provides functional coordination of the TOPS MP position, the audio response units (ARUs), and the directory assistance (DA) service. This expands the capability of the TOPS MP1 from a toll and assist (TA) operator position to an integrated TA and DA position.

This feature coordinates TOPS MP call processing with the DA service to service DA and intercept calls. It also connects ARUs with the subscriber to provide recorded information.

The following call types are improved by this feature:

- * DA
- * DA ONI (operator calling number identification)
- * DA ANIF (automatic number identification failure)
- * Multiple DA requests
- * DA recall
- * automatic INT (intercept)
- * INT ONI
- * INT ANIF
- * operator quoted calls
- * INT cut-through
- * INT recalls
- * INT special

Implementation

A TOPS MP position that can provide DA service must be allocated for both DA and INT calls. DA calls require the operator to enter search information and to receive DA listings from the directory assistance service (DAS). INT calls require the operator to receive intercept listings information and to enter the called number for INT ONI and ANIF calls.

The position and the subscriber are connected to the three-port conference circuit, a message identifying the position is sent to DAS, and the call is presented to an operator. The DA/INT screen or the billing screen is presented to the operator. The operator display contains service messages indicating the additional duties the operator must perform to complete the call.

DAS102 log is generated when the DAS fails to respond or responds with a negative acknowledgement to a DAS logon or logout.

DAS103 log is generated when there is a problem obtaining an ARU or when there is a problem with ARU DAS signaling.

New table VROPT contains voice response parameters.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge

NTX001AA Common Basic

NTX273AA Multi-Protocol Controller BX.25

NTX801AA Toll Features I

either NTX030CATOPS Call Processing Features (upgraded by NTX030CB)

or NTX030CB TOPS Call Processing Features (upgraded by NTX030CC)

or NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0742

DMS ALL BCS27 Feature Description Manual		890124
NTXA63AA01	Status: LTD TOPS MP AUDIO RESPONSE INTERFACE I	
CALL PROCESSING	:	
TOPS MP STANDARD DA INTERCEPT MESSAGING		F6530
Section B Available Features		NTXA63AA01
		Page 271

Package	NTXA63AA01 TOPS MP AUDIO RESPONSE INTERFACE I
Feature set	CALL PROCESSING
Feature	TOPS MP STANDARD DA INTERCEPT MESSAGING
Feature no	F6530

Synopsis

This feature supports the messaging protocol between a DMS TOPS audio response unit (ARU) and Computer Consoles Inc. (CCI) directory assistance system/computerized (DAS/C) database. These messages set up the voice response path from the DAS/C system to the calling party. Message types supported are:

- * call begin and call end
- * ARU request and ARU connect
- * POS request, POS connect, and POS disconnect
- * AMA transfer and POS release
- * call float
- * call status
- * POS status, POS status reply, audit request, and audit reply

This feature also provides a system to simulate the exchange of call control and billing messages between DMS-TOPS and a DAS/C vendor. This allows designer testing prior to testing with the vendor's database.

Implementation

Log TCC100 informs the craftsperson that an error occurred in the messaging between DMS and the CCI DAS/C.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

The protocol portion of this feature interacts with F6531 TOPS MP INTERNAL/EXTERNAL ARU MESSAGE ROUTING feature and its associated tables.

The simulator portion of this feature interacts with F6337 MPC Multi-Link Management and its associated tables.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0738

NTXA64AA03 Status: LTD RES(RESIDENTIAL ENHANCED SERVICES) BASE

CALL PROCESSING	:	
RESIDENTIAL ENHANCED SERVICES (RES)		F6534
RES FEATURE TRANSPARENCY		F6535
RES DIGIT COLLECTION ARRANGEMENTS		F6536
FEATURES	:	
RES FEATURE SET EXPANSION 1		F6960
RES FEATURE SET EXPANSION 2		F6961
CALL PROCESSING	:	
RES/CLASS SERVICE ORDER SIMPLIFICATION AND OA AND M		F7234
RINGING	:	
TEEN SERVICE ON RES		G0106

Package	NTXA64AA03 RES(RESIDENTIAL ENHANCED SERVICES) BASE
Feature set	CALL PROCESSING
Feature	RESIDENTIAL ENHANCED SERVICES (RES)
Feature no	F6534

FEATURE SYNOPSIS

This feature introduces an enhanced class of residential telephone service. Subscribers to this new class of service will have access to an augmented custom calling feature set. The new class of service is called RES: Residential Enhanced Services.

FEATURE DESCRIPTION

The custom calling features provided under the RES program will be drawn from the IBN environment. Initially RES subscribers will have access to a subset of the custom calling features available to both POTS and IBN subscribers. In the future the feature set available to RES subscribers will be augmented by drawing on the extensive IBN feature set.

A new line class code is implemented to support the RES service.

RES is implemented using the IBN basic software.

The RES line class code supports the standard dial pulse and digitone sets. In BCS-25 most of the features available to single party flat rate (1FR) lines are available to RES lines. This feature set will be extended in future BCS releases.

Ref: FDOC AG0508

Package	NTXA64AA03 RES(RESIDENTIAL ENHANCED SERVICES) BASE
Feature set	CALL PROCESSING
Feature	RES FEATURE TRANSPARENCY
Feature no	F6535

FEATURE SYNOPSIS

This feature changes IBN implementation of certain features to behave like the POTS version. These changes are optional if necessary.

FEATURE DESCRIPTION

This feature enhances several existing IBN station features. The following features are affected:

- Speed Calling Short (SCS)
- Speed Calling Long (SCL)
- Call Forwarding Universal (CFU)
- Call Forwarding Intragroup (CFI)
- Call Forwarding Busy (CFB)
- Call Forwarding Don't Answer (CFD)

The IBN station feature Call Forwarding Fixed (CFF) is introduced by this feature. It works the same as CFU except that the subscriber cannot program the forward to directory number. Operating Telco does this.

The IBN station feature enhancements provided by this feature create IBN feature versions that emulate the corresponding POTS features. The goal is to permit POTS residential and small business subscribers with custom calling features to upgrade their class of service from 1FR to RES without detecting any functional differences in feature operation.

Some enhancements contribute to LSSGR compliance.

Ref: FDOC AG0503

Package	NTXA64AA03 RES(RESIDENTIAL ENHANCED SERVICES) BASE
Feature set	CALL PROCESSING
Feature	RES DIGIT COLLECTION ARRANGEMENTS
Feature no	F6536

FEATURE SYNOPSIS

This feature enhances IBN and RES line digit collection by providing a RES digit collection name and by providing a RES selector in Table DIGCOL.

FEATURE DESCRIPTION

DGCOLNM RES and DIGCOL RES introduced by this feature allows IBN and RES line digit collection to follow the POTS digit collection algorithm. Short interdigit timing is performed between the first and second and between the second and third digits dialed.

This minimizes post dial delay when one and two digit speed calling abbreviations and feature access codes are dialed. It also enhances system capacity by reducing Line Controlling Device (LCD) to Central Control (CC) messaging.

Table DIGCOL selector RES must only be used when the dial plan does not require an access code to precede a table IBNXLA NET destination.

Ref: FDOC AG0504

Package	NTXA64AA03 RES(RESIDENTIAL ENHANCED SERVICES) BASE
Feature set	FEATURES
Feature	RES FEATURE SET EXPANSION 1
Feature no	F6960

FEATURE SYNOPSIS

This feature introduces three Meridian Digital Centrex (MDC) features into the Residential Enhanced Services (RES) environment. The three features are:

call transfer
call pickup
make set busy.

FEATURE DESCRIPTION

Call Transfer

Call Transfer (CT) gives the subscriber the ability to transfer a calling or called party to a third party. Call transfer is an option assigned at the customer group level. For the RES offering of Call Transfer, CT should be denied at the customer group level. Subscribers who wish to have the Call Transfer option should be assigned the option through Service Orders.

Call Pickup

Call Pickup is a line option which gives the subscriber the ability to pick up calls within a predefined pick-up group by dialing an access code. The pick-up group is defined through the use of the Service Order add-option command which is used to assign the Call Pickup option to the line.

Make Set Busy

The Make Set Busy feature allows a subscriber to put a line in the busy state by dialing an access code. For the RES offering of Make Set Busy no treatment should be datafilled in Table CUSTSTN so that intragroup and intergroup calls receive busy tone.

Ref: FDOC AG0967

Package	NTXA64AA03 RES(RESIDENTIAL ENHANCED SERVICES) BASE
Feature set	FEATURES
Feature	RES FEATURE SET EXPANSION 2
Feature no	F6961

Synopsis

RES Feature Set Expansion 2 allows a subscriber with a RES line to use the following custom calling features (CCF):

- * Group Intercom (GIC)
- * POTS Intercom (INT)
- * Sleeve Lead Control (FRO)
- * Restricted Sent Paid (RSP)
- * Remote Message Register (RMR)
- * Remote Register SD Point (RMS)
- * Remote Meter Pulsing (RMP).

Implementation

The Group Intercom feature is implemented and functions in the same way with RES lines as it does with IBN lines. The other custom calling features listed above are implemented and function in the same way with RES lines as they do with POTS lines.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic
NTX413AA IBN - Enhanced Call Forwarding
NTX898AA Variable Speed Call Access Code - IBN
NTX901AA Local Features I

Activation/Deactivation

To initiate a GIC call to another member of the group, the calling party goes off-hook, waits for dial tone, and dials an octothorpe (#), followed by the intercom member number of the called party.

To complete an INT call, the calling party goes off-hook, waits for dial tone and dials his own Directory Number (DN). When the calling party receives Single Party Revertive Ringing treatment, he replaces the handset. The calling party's phone and its extensions ring. When the ringing stops,

the called party has answered. The calling party goes off-hook and converses with the called party.

An INT call can also be initiated as the second leg of a three-way call.

Interactions

The GIC feature can be used with the following RES features:

- * Three-Way Calling
- * Call Transfer
- * Call Hold
- * Call Waiting
- * Call Waiting Originating
- * Dial Call Waiting
- * Call Forward Busy
- * Call Forward Don't Answer
- * Directed Call Pickup
- * Call Pickup.

Restrictions

The GIC feature can only be used with a Digitone set. Dial pulse sets cannot initiate GIC calls, but they can receive them.

A line assigned Denied Incoming or Denied Termination can only be used by a GIC group member to call another group member.

A line assigned Denied Origination cannot initiate GIC calls.

The pilot of a Multiline Hunt (MLH), Distributed Line Hunt (DLH), or Directory Number Hunt (DNH) group can be a member of a GIC group. Each member of a DNH group can also be a member of a GIC group. However, if a call to a GIC member number terminates on a hunt group station, hunting will not take place.

The GIC member number cannot be used to activate Call Forwarding to a station.

A GIC member number cannot be stored in a Speed Call List.

A 500 or 2500 set user cannot be both a member of a GIC group and a member of a Multiple Appearance Directory Number (MADN) group.

The INT feature is not compatible with the following features:

- * Distributed Line Hunt and Multiline Hunt
- * Multiple Appearance Directory Number and Multi-Party Bridging
- * Feature Group A

No flash-activated features can be initiated while an INT call is active.

Reference

FDOC AG0968

Package	NTXA64AA03 RES(RESIDENTIAL ENHANCED SERVICES) BASE
Feature set	CALL PROCESSING
Feature	RES/CLASS SERVICE ORDER SIMPLIFICATION AND OA AND M
Feature no	F7234

Synopsis

This feature makes the service order procedures for RES and one-party flat rate (1FR) lines the same, thereby simplifying processing of service orders (SO) for RES lines.

The following service order tasks are now the same for RES and 1FR lines:

- * create a line
- * add, delete or modify an option
- * query a line
- * change a line treatment group

A 1FR line can now be automatically changed to a RES line and vice versa.

Implementation

A 1FR line is defined in Table LENLINES. A RES line is defined in Table IBNLINES. The only difference between the service order procedure for RES and 1FR lines is the RES-specific options defined in Table LCCOPT field LCC. This field is "RES" for RES lines and "1FR" for 1FR lines.

New office parameter RES_SO_SIMPLIFICATION in table OFCVAR has two fields RES_AS_1FR and ENHANCED_1FR_OPTIONS. These fields can take value 'Y' or 'N'. They are set to 'Y' to activate this feature. This option controls SO behaviour and prompting, which are described in DDOC AG1246. Default setting for BCS27 IS (in service) CC load is "N". Default setting for BCS27 IS subsequent CC loads is "Y".

New field RESINFO has been added to Table LINEATTR in order to make the procedure to add RES lines the same as the procedure to add 1FR lines. RESINFO has three subfields which are prompted for if RESINFO = "Y":

- * CUSTGRP corresponds to customer group datafilled in Table CUSTHEAD
- * SUBGRP is the customer subgroup
- * NCOS corresponds to network class of service datafilled in Table NCOS

Table IBNLINES now displays the line attribute index when the LCC is 'RES'. New field LNATTIDX replaces fields CUSTGRP, SUBGRP, NCOS, and SNPA.

Tables CFX and IBNFAT are affected by the changes to call forward screening.

SO commands NEW, EST and CHG now display identical prompts for 1FR and RES lines.

SO commands ADO, DEO, and CHF now allow 1FR feature codes to be used for RES lines.

SO commands NEW, EST and ADD now use the same prompts for RES and 1FR lines.

SO commands ADO, DEO, and CHG now allow options HOTel and Flexible ANI on RES lines.

New SO command CLTG can be used to change a RES line's treatment group.

Commands QDN, QDNWRK, QLEN and QLENWRK now display RES lines and features in the same format as 1FR lines and features.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX413AA IBN - Enhanced Call Forwarding
NTX898AA Variable Speed Call Access Code - IBN
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

In the translation tables, the network GEN selector's LAI and the RES line's LAI should be identical.

CFW U option is not available on RES lines.

MMI error messages issued during SO operations on RES lines or 1FR lines may refer to IBN feature codes.

Table IBNLINES field LCC can no longer be changed from IBN to RES or RES to IBN. These changes must be made using the SO CHG command.

SO commands ADO, DEO, and CHF cannot be used to change a hunt group line from 1FR to RES or vice versa.

Reference: FDOC AG1246

Package	NTXA64AA03 RES(RESIDENTIAL ENHANCED SERVICES) BASE
Feature set	RINGING
Feature	TEEN SERVICE ON RES
Feature no	G0106

Synopsis

Teen service provides multiple directory numbers assigned to one line. One primary directory number (PDN) and up to three secondary directory numbers (SDN) can be assigned. This feature extends Teen Service to residential enhanced service (RES) lines. Different ringing patterns identify the number called.

Implementation

This feature is available on lines connected to line concentrating modules, line modules, and subscriber carrier modules with coded and superimposed ringing capability.

Table LCCOPT has a new compatibility option for RES line class code.

Table IBNFEAT has new option SDN for teen service.

Query directory number (QDN) command now includes the teen service option when querying RES lines.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX413AA IBN - Enhanced Call Forwarding
- NTX898AA Variable Speed Call Access Code - IBN
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

When the PDN has call forwarding (CFW), call forwarding busy line (CFBL), or call forward don't answer (CFDA), SDNs are not forwarded. SDNs can be forwarded to the same line as the PDN through a service order.

An office equipped with the Enhanced Call Waiting package can provide call waiting tones.

Automatic callback (ACB) and automatic recall (AR) cadence is the same as SDN-2 for lines equipped with coded and superimposed ringing. With frequency selective ringing, ACB/AR ring back cadence is the same as SDN-1, so that the user cannot distinguish between the features.

A teen line with display can display numbers calling the PDN and SDNs.

Customer originated trace (F0120) is available with teen service. The trace is made on the last call placed to either the PDN or the SDN.

Distinctive ringing patterns conflict with SDN ringing patterns.

This feature is not compatible with the following features and lines: denied terminating service, directory number hunt, multiple line hunt, remote call forwarding, call forwarding group don't answer, call forwarding group don't answer IBN, hotel, remote meter pulsing, restricted sent paid lines, private branch exchange lines, private branch exchange message rate lines, multiple directory number lines, integrated business network lines, coin lines.

Limitations

Only one SDN can be assigned on single party lines.

All SDNs must be in the same serving numbering plan area as the PDN and have the same office code.

Reference: FDOC AF1442

NTXA66AA01 Status: LTD ENHANCED OFFICE RECOVERY

ADMINISTRATION	:	
PM MAP ENHANCEMENTS		F6983
XPM IPML DATA DISTRIBUTION		F6984
XPM PSIDE DATA DISTRIBUTION		F6985

Package	NTXA66AA01 ENHANCED OFFICE RECOVERY
Feature set	ADMINISTRATION
Feature	PM MAP ENHANCEMENTS
Feature no	F6983

FEATURE SYNOPSIS

This feature allows a craftsperson to execute a single command to perform a maintenance operation on many PMs. The following maintenance operations can be concurrently executed on many PMs:

Busy (Bsy)
Return to Service (RTS)
Offline (Offl)
Test (Tst)
Load (LoadPM)
Switch Activity (Swact).

This feature also provides a new command, LISTSET, to allow the craftsperson to display a list of the PMs in the post set.

FEATURE DESCRIPTION

The commands for the previously listed maintenance operations have been changed to include an 'ALL' parameter. By invoking the command with the 'ALL' parameter, the maintenance operation will be executed on each PM in the post set with the same PM type as the current PM. Prior to each operation invoked with an 'ALL' parameter, the craftsperson will be asked to confirm that operation.

The changes to the maintenance operations are only available to XPM-based peripheral modules and will only function on a group of PMs of the same PM type.

Ref: FDOC AL0480

Package	NTXA66AA01 ENHANCED OFFICE RECOVERY
Feature set	ADMINISTRATION
Feature	XPM IPML DATA DISTRIBUTION
Feature no	F6984

FEATURE SYNOPSIS

This feature uses the Magnetic Tape Center in the Central Control as a generalized data distribution network and allows the PM loader to make use of this network.

FEATURE DESCRIPTION

The data distribution network implemented by this feature is a combination of an Inter-Peripheral Message Link (IPML) message broadcast network and the P-side data distributor in the XPM.

This feature uses this network for the distribution of PM loads, execs, and P-side data distribution commands.

This feature provides the CC utilities needed to create, manage, and delete IPML broadcast networks and to utilize the P-side data distributor.

The PM loader uses the data distribution network to do the following:

- load many XPMs active units in ROM at once
- load many XPMs inactive units in ROM at once
- send execs to many XPMs at once
- load any number of PMs on the P-side of XPMs
- store PM loads in many XPMs connected using IPMLs.

Ref: FDOC AL0481

Package	NTXA66AA01 ENHANCED OFFICE RECOVERY
Feature set	ADMINISTRATION
Feature	XPM PSIDE DATA DISTRIBUTION
Feature no	F6985

FEATURE SYNOPSIS

This feature implements a general XPM P-side data distribution network. This network allows an XPM to do the following:

- load software into several P-side peripherals modules in parallel
- load its mate unit
- distribute a software load or data to other new peripheral module types
- store P-side peripheral module software loads in its own protected memory.

FEATURE DESCRIPTION

This feature allows the Signaling Terminal (ST) loader to support different peripheral module types so that the P-side peripheral modules can be loaded simultaneously by the XPM.

This feature also allows data and software loads to be distributed to the P-side peripheral modules and to XPMs connected by Inter-Peripheral Message Links (IPMLs).

Ref: FDOC AL0482

NTXA67AA01 Status: LTD EXTENDED XPM DIAGNOSTICS

ADMINISTRATION	:	
XPM 6X45BA MAINTENANCE ENHANCEMENTS		F7124
MAINTENANCE AND TESTING	:	
XPM IMC DIAGNOSTICS		F7126
MAINTENANCE	:	
XPM MATE DIAGNOSTIC		F7131
XPM TASK LEVEL UART IMC MESSAGING ENHANCEMENT		F7134

Package	NTXA67AA01 EXTENDED XPM DIAGNOSTICS
Feature set	ADMINISTRATION
Feature	XPM 6X45BA MAINTENANCE ENHANCEMENTS
Feature no	F7124

FEATURE SYNOPSIS

This feature uses the capabilities provided by the firmware in the XPM 6X45BA processor card to improve the maintenance of XPMs equipped with the 6X45BAs.

FEATURE DESCRIPTION

Testing

ROM diagnostics test for possible failures in the processor complex of the XPM; task level tests detect errors in other pieces of hardware.

The test sequence includes the ROM diagnostics with task level tests run for out-of-service XPMs.

A message is printed on the visual display unit of the MAP to inform the craftsperson that non-destructive ROM diagnostics are to be run as a result of the test command.

Return to Service Sequence

This feature sends the ROM/RAM query message to the XPM prior to the pmreset step.

If the reply from the query indicates that the XPM is at ROM, a log is generated to inform the craftsperson of this.

If the reply indicates that the XPM has not been loaded, the RTS is aborted; in the case of a system RTS, auto loading is initiated, and in the case of a manual RTS, a log is generated.

The non-destructive ROM diagnostics are run as part of the test on the inactive XPM unit.

Loading Sequence

The PM loader in the CC makes use of the loading method supported by XPM 6X45BA.

Changes to Inventory Table

This feature replaces the firmware release field in the XPM inventory table with product engineering codes (PECs) of the 6X45s equipped in the XPM.

The ROM/RAM query is used to verify the consistency of the datafilled PECs with the firmware in the XPM if the XPM is equipped with the 6X69 messaging card.

Ref: FDOC AG0965

Package	NTXA67AA01 EXTENDED XPM DIAGNOSTICS
Feature set	MAINTENANCE AND TESTING
Feature	XPM IMC DIAGNOSTICS
Feature no	F7126

FEATURE SYNOPSIS

This feature provides a diagnostic for each of the two Inter Module Communication (IMC) links of an XPM. The first IMC link runs between the message cards of each unit at 64 Kbits/sec. The second link runs between the two signaling processors at 19.2 Kbits/sec.

This IMC diagnostic verifies the sanity of both IMC links at regular intervals.

FEATURE DESCRIPTION

Maintain Link Status

When the IMC diagnostic detects that one of the IMC links is faulty, it closes this link and reports the fault to the Central Control (CC). When the fault is fixed, the diagnostic re-opens the link and makes it available for general use.

Detect Mate in ROM and Tell CC

If the mate XPM is working at ROM level, the IMC diagnostic detects this and reports it to the CC.

Detect Link Faults and Tell CC

When a link failure is detected by the IMC diagnostic, a non-critical fault is reported to the CC. Reporting a non-critical fault causes the CC to put the node in the In-Service Trouble state. The fault is reported to the craftsperson and call processing continues normally.

Ref: FDOC AL0562

Package	NTXA67AA01 EXTENDED XPM DIAGNOSTICS
Feature set	MAINTENANCE
Feature	XPM MATE DIAGNOSTIC
Feature no	F7131

FEATURE SYNOPSIS

This feature allows the Central Control (CC) to diagnose an XPM unit through its mate XPM unit. This method of diagnosis is used when the CC is unable to communicate directly with a faulty unit whose mate unit is in-service.

FEATURE DESCRIPTION

Mate Diagnosis consists of finding what is wrong with a faulty XPM unit by requesting its mate unit to diagnose it. This is done using the Inter Module Communication (IMC) links between the two units. Mate diagnosis is requested by the CC when it is unable to communicate with one unit of an XPM, but is able to communicate with the other unit.

Whenever a communication failure occurs between the CC and one XPM unit, the CC tries to re-establish the communication with this unit, and if it cannot do so, it sends a request to the mate XPM unit to have the faulty unit diagnosed by the mate.

Mate diagnosis attempts to locate the fault in the other unit by running diagnostics on the faulty unit. When the mate diagnosis is complete, the results are sent to the CC.

Ref: FDOC AL0476

Package	NTXA67AA01 EXTENDED XPM DIAGNOSTICS
Feature set	MAINTENANCE
Feature	XPM TASK LEVEL UART IMC MESSAGING ENHANCEMENT
Feature no	F7134

FEATURE SYNOPSIS

This feature provides a Universal Asynchronous Receiver and Transmitter Inter-Module Communication (UART IMC) link. The UART IMC link allows the XPM to talk to the mate unit to improve the fault isolation diagnostic and to transport maintenance messages.

FEATURE DESCRIPTION

The UART IMC link operates at a rate of 19.2 kbits/sec. The UART IMC link only carries maintenance messages. It is capable of messaging to both the task level and the ROM level software of the mate unit.

Ref: FDOC AG0312

Package	NTXA69AA01 DIGITAL NAILED-UP SPECIAL SERVICE
Feature set	SERVICES
Feature	SPEPCIAL/NAILED UP CONNECTIONS
Feature no	F6596

FEATURE SYNOPSIS

This feature will provide 'Special' connections between 'end points' on different nodes. It will also permit 'special' connections that terminate on DTCs, LGCs and LTCs.

FEATURE DESCRIPTION

'Special' connections are permanently assigned or 'nailed up' 2 way 64 kbit/sec connections between 'end points'.

The connections provide for data communication between the end points and are currently made as looparounds in the common node, this being the XPM. ISDN Access Controller (IAC) and Subscriber Module DMS-1 Urban (SMU) are the only XPMs that support 'Special' connections at present. An end point is a terminal device attached to the 'p' side of an XPM.

This feature enhances the existing capability as follows:

- 'Special' connections between 'end points' that terminate on different XPMs are permitted, that route through the DMS network module.
- Termination support is extended to cover DTC, LTC and LGC.

Ref:

FDOC AC0279
FDOC AF0264
FDOC AC0095

Package	NTXA72AA01 SECONDARY MADN CALL FORWARDING
Feature set	FAST FEATURE-BELL SOUTH
Feature	SECONDARY MADN CALL FORWARDING
Feature no	G0085

FEATURE SYNOPSIS

This feature allows secondary Multiple Appearance Directory Number (MADN) members to activate and deactivate call forwarding from their sets.

FEATURE DESCRIPTION

Multiple Appearance Directory Number is a Meridian Digital Centrex (MDC) feature that associates a single Directory Number to a group of line appearances within a switch. This group of line appearances is referred to as a MADN group and each line appearance is referred to as a MADN group member.

Each secondary MADN member can program call forwarding.

This feature adds a new table, MDNMEM. Whenever a new MADN member is created, a new entry is automatically added to this table. Whenever a MADN member is deleted, the corresponding entry is deleted automatically from Table MDNMEM.

This feature adds a new Service Order line option, CFMDN. This option can be added to any secondary MADN member even if the primary member of the group does not have any kind of Call Forward feature.

Query commands QDN, QLEN, QLENWRK, and QDNWRK are changed to provide the CFMDN option. QLEN command on EBSs will display CFMDN in the option list only when the primary DN of the set has the option. QDN command will display the CFMDN option beside each member of the MADN group with the CFMDN option.

Ref: FDOC AG0985

Package	NTXA77AA01 ENHANCED UCD
Feature set	BUSINESS SERVICES
Feature	UCD ON EBS SET AND UCD SD POINT
Feature no	F2989

FEATURE SYNOPSIS

This feature improves the Uniform Call Distribution (UCD) feature in the following ways:

- extends the availability of UCD to Electronic Business Sets
- extends the availability of the Simplified Message Desk Interface to Electronic Business Sets
- provides single key stroke login into specified UCD Groups
- provides the capability to distinguish UCD calls from non-UCD calls
- provides UCD log in/out monitoring.

FEATURE DESCRIPTION

Uniform Call Distribution permits calls to be evenly distributed to a number of pre-designated stations. This feature extends the availability of UCD from 500/2500 sets to both 500/2500 sets and Electronic Business Sets (EBS).

Simplified Message Desk Interface allows a station to be configured as a message desk. A message desk serves as an answering service for stations whose calls are forwarded there. This feature extends the availability of the SMDI from 500/2500 sets to both 500/2500 sets and EBS.

Two types of calls, UCD and non-UCD, may terminate on UCD stations. This feature distinguishes UCD calls from non-UCD calls through the assignment of a Distinctive Ringing option.

A UCD agent must log into a UCD group before UCD calls can be received; likewise, when a UCD agent logs out of a UCD group, UCD calls can no longer be received. This feature provides single key stroke login through the assignment of a UCD Login Key or multiple UCD Login Keys.

Ref: FDOC AL0818

NTXA79AA02 Status: LTD IBN TRUNKS WITH ISUP SIGNALLING

CALL PROCESSING	:	
IBN TRUNKS WITH ISUP SIGNALLING		F6676
AC TO IBNISUP INTERWORKING		F7356

Package	NTXA79AA02 IBN TRUNKS WITH ISUP SIGNALLING
Feature set	CALL PROCESSING
Feature	IBN TRUNKS WITH ISUP SIGNALLING
Feature no	F6676

FEATURE SYNOPSIS

This feature allows Meridian Digital Centrex trunk group types IBNT0, IBNT1, and IBNT2 to use Integrated Services Digital Network User Part (ISUP) trunk signaling.

A number of MDC trunk features are also provided.

FEATURE DESCRIPTION

This feature permits ISUP Signaling to be assigned to MDC type trunks in Table TRKSGRP.

The following MDC trunk capabilities are provided:

- Traffic Separation Numbers
- Pad Groups
- OM No Circuit Classes
- Select Sequence
- Killer Trunks
- Echo Suppressors
- Prefix Digits
- IBN Customer Groups
- Customer Group Transparency
- Distinctive Ringing
- Supervision Types
- Remote Access to Attendant Console
- Attendant Control of Trunk Group Access
- Attendant Trunk Group Busy Lamps
- Billing Directory Number
- Station Message Detail Recording
- Special Billing
- Answer Time
- Network Class of Service
- Line Screening Codes(LSC)
- Alternate LSC Flag Number
- LSC Flexible Intercept
- Alternate LSC Flexible Intercept
- Alternate Class of Service
- Terminating Restriction Codes
- Authorization Codes (with the use of loopback trunks)
- Trunk Restrictions
- Extension Dialing
- Electronic Switching Network
- Direct Outward Dial Network
- Outward Wide Area Telephone Service

Private Network Dialing
Network Speed Calling
Tie Trunks
Time of Day Routing
Mass Trunk Conversion
Direct Inward System Access (with the use of loopback trunks)
Trunk Answer From Any Station
Virtual Facility Groups
Expensive Route Warning Tone
Off-Hook Queuing
Network Name Display
Networked Ring Again
Dial Plan Display

ISUP MDC trunks will also provide Network Connected Number Display.

Ref: FDOC AG0671

Package	NTXA79AA02 IBN TRUNKS WITH ISUP SIGNALLING
Feature set	CALL PROCESSING
Feature	AC TO IBNISUP INTERWORKING
Feature no	F7356

Synopsis

The Attendant Console to Integrated Business Network - Integrated Services Digital Network User Part (IBN-ISUP) Trunks Interworking feature allows an Attendant Console to work directly with IBN-ISUP trunks.

This feature eliminates the need to use loopback trunks to allow an Attendant Console to work with IBN-ISUP trunks.

Implementation

Most Attendant Console features work directly with Plain Ordinary Telephone Service (POTS) Per Trunk Signaling (PTS) trunks.

This feature allows the following Attendant Console features to work directly with IBN-ISUP trunks:

- Three Way Call
- Automatic Call Distribution
- Universal Call Distribution
- Announcement in AC Queue
- Busy Verify Line
- Attendant Console Call Park/Unpark
- Attendant Console Call Waiting
- Camp-on
- Camp-on with Music
- AC Conference
- Do Not Disturb
- Display of Calling Line ID and Network Class of Service
- Hold
- Immediate Release
- Interposition Calling
- Meet Me Conference
- Message Waiting
- Music in AC Queue
- Music on Hold
- Preset Conference
- Recall to AC
- AC Release
- Routing ISUP to Treatment
- Secrecy

Virtual Facility Group
AC End-to-End Signaling

These features are implemented and function in the same way with IBN-ISUP trunks as they do with POTS-PTS trunks.

The following Attendant Console features apply only to IBN-ISUP trunks and are therefore implemented and function in the same way with IBN-ISUP trunks as they do with IBN-PTS trunks.

This feature allows these Attendant Console features to work directly with IBN-ISUP trunks:

Loud Speaker Paging
Attendant Console Trunk Queueing
Busy Verify Trunk
Trunk Group Busy
Trunk Access Control
Virtual Group Busy
Virtual Access Control
Group Trunk Group Busy
Group Trunk Access Control
Group Virtual Group Busy
Group Virtual Access Control.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTXA64AA RES (Residential Enhanced Services) Base
NTXA82AA CLASS Line Office Data
NTX901AA Local Features I.

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing features.

Restrictions

The following AC feature does not work directly with IBN-ISUP trunks:

AC to Code Calling

If the AC attempts to access this feature through ISUP trunks, loopback trunks will be inserted between the AC and ISUP trunk and the call will proceed.

Reference

FDOC AD1318

DMS ALL BCS27 Feature Description Manual	890124
NTXA80AA01 Status: LTD NETWORK NAME DISPLAY	
DISPLAY FEATURES NETWORK NAME DISPLAY	: F6677
Section B Available Features	NTXA80AA01 Page 309

Package	NTXA80AA01 NETWORK NAME DISPLAY
Feature set	DISPLAY FEATURES
Feature	NETWORK NAME DISPLAY
Feature no	F6677

FEATURE SYNOPSIS

This feature provides the name information of the calling and called parties across a CCS7 network for POTS and MDC lines. If one or both of the parties is equipped with an Electronic Business Set (EBS) with display, the name of the connected party will be displayed when available.

The MDC feature call waiting is supported to provide the name information to the end user.

Name information is also provided to the end user for MDC features call forwarding and call transfer, under limited conditions. For call forwarding, the base station must be located at the originating or terminating office. For call transfer, one of the remaining two parties must be located at the same office as the controller.

FEATURE DESCRIPTION

New optional parameters for CCS7 are defined to carry the necessary information across the network.

The Party Information parameter conveys numeric information such as account number and travelling class marks and alphabetic information such as name.

The End-to-End Information Indicator in the Forward Call Indicator and the Backward Call Indicator are used to convey whether the calling party and the connected party name information is available.

The Supplementary End-to-End Information Request Indicator parameter is used to request the name information of the connected party.

The Supplementary End-to-End Information Response Indicator parameter indicates whether the requested name information is included in the message.

Ref: FDOC AG0980

Package	NTXA81AA01 EXTENSION BRIDGED SERVICES
Feature set	SERVICES
Feature	EXTENSION BRIDGED SERVICES
Feature no	F2714

FEATURE SYNOPSIS

Extension Bridging (EXB) represents a new variant of the MDC Multiple Appearance Directory Number (MADN) feature, but unlike the preceding feature variants, is also included within the Residential Enhanced Services (RES) package to be offered for POTS subscribers.

It is similar to Single Bridge Arrangement (SBA), allowing a group of subscribers to emulate a single line with a number of extensions, except for call forwarding and speed calling differences.

SBA enables a MADN group member to establish an external call, while allowing a non-active member to subsequently bridge into the call without the active member first releasing privacy. In addition, a privacy option permits any active member to inhibit another member from bridging in.

EXB differs from SBA only in permitting wider flexibility in call forwarding and speed calling. It allows group members to emulate being extensions of the same line; thus they should have similar line option sets (noting that call forwarding may be applied only to the primary member). EXB therefore permits any member to implement call forwarding, assuming the option has been assigned to the primary member. (With all other MADN variants, only the primary member has this capability.) Also in an EXB group, members with speed calling long list (SCL) or short list (SCS) options share common respective lists. Any member with speed calling may use and modify the applicable common list. (This contrasts with SBA where each member has its own list with no requirement for all members' lists to be the same size.)

EXB is not supported on the Electronic Business Set (EBS). For billing purposes, an EXB line is treated as a single line regardless of how many members are active on a call.

Ref: FDOC AF0827

NTXA82AA02 Status: LTD CLASS LINE OFFICE DATA

NETWORKING	:	
CLASS: LINE AND OFFICE DATA		F6660
CLASS: INC/OTG MEMORY SLOT CALL PROCESSING		F6687
CLASS: CALL MEMORY ENHANCEMENTS		F7236
BILLING	:	
CLASS: USAGE SENSITIVE PRICING BILLING		F7411

Package	NTXA82AA02 CLASS LINE OFFICE DATA
Feature set	NETWORKING
Feature	CLASS: LINE AND OFFICE DATA
Feature no	F6660

FEATURE SYNOPSIS

This feature provides the line and office data required for the operation of the following CLASS features:

Calling Number Delivery (CND),
Calling Number Delivery Blocking (CNDB),
Automatic Call Back (ACB),
Automatic Recal (AR),
Customer Originated Trace (COT).

FEATURE DESCRIPTION

CLASS office data allows each Operating Company to activate and deactivate individual CLASS features, and to specify announcements and other office parameters as required for feature operation.

CLASS line data allows the Operating Company to assign CLASS features to individual lines through Service Orders.

CLASS Office Data

Once a CLASS feature is activated within the office, it is made accessible to the user by subscription access using flat rate billing.

The Operating Company can also datafill specific office data, such as signaling parameters, timeout values, activation levels, and associated announcement lists.

A new table, RESOFC, is introduced by this feature to store the per feature office data.

CLASS Line Data

CLASS line options are added to subscriber lines through the existing Service Orders.

Call Memory

In order to support CLASS features such as Customer Originated Trace and Automatic Recall the following information relating to the last incoming call is stored in incoming call memory:

the DN (or LEN) of the party which originated the call
the presentation restriction indicator of the DN originating the call
the type of line originating the call
the time when the call was received

whether the call originated within the same office
whether ISUP trunks, employing CCS7 and Per Trunk Signaling (PTS) trunks were encountered

In order to support CLASS features such as Automatic Call Back, the following information relating to the last outgoing call is stored in outgoing call memory:

the dialed digits

whether Calling Number Delivery Blocking was activated

whether the call originated within the same office.

The QCM command will query call memory associated with a line. The contents of the incoming and outgoing call memory blocks associated with the line are displayed.

Ref: FDOC AC0258

Package	NTXA82AA02 CLASS LINE OFFICE DATA
Feature set	NETWORKING
Feature	CLASS: INC/OTG MEMORY SLOT CALL PROCESSING
Feature no	F6687

FEATURE SYNOPSIS

Custom Local Area Signaling Services (CLASS) require that data associated with previous calls be kept on a per line basis. This data is stored in call memory.

This feature allows updating of incoming and outgoing call memory. Incoming call memory is updated when ringing is applied to the subscriber's line; outgoing call memory is updated for all outgoing calls.

FEATURE DESCRIPTION

Call memory is used to retain data about the last incoming and outgoing call for a subscriber.

Incoming call memory is used to store information about the most recent call to ring a subscriber's set. Incoming call memory is updated when ringing is applied to the subscriber's line.

Outgoing call memory is used to store information about the most recent call originated by a subscriber. Outgoing call memory is updated for each outgoing call when the call is successfully routed.

Ref: FDOC AG0959

Package	NTXA82AA02 CLASS LINE OFFICE DATA
Feature set	NETWORKING
Feature	CLASS: CALL MEMORY ENHANCEMENTS
Feature no	F7236

Synopsis

The Call Memory Enhancements feature improves the updating of the incoming and outgoing call memory in the following ways:

- * adds an indication of the uniqueness of the calling party's directory number (DN) in the incoming call memory
- * stores the incoming trunk in the incoming call memory, if the DN is unavailable
- * prevents certain call types from updating outgoing call memory
- * updates the incoming call memory for incoming calls that call wait.

Implementation

This feature adds a new field, NONUNIQUE, to Table DNATTRS to show that a DN is non-unique.

The name of field NODID in Table DNGRPS is changed to NONUNIQUE. This field indicates that DN substitution has occurred and that the substituted DN is not unique.

If the Initial Address Message (IAM) is not sent as part of call setup or the IAM does not provide the calling party address, the incoming trunk is stored in incoming call memory.

If a call comes in on a non-ISUP trunk, the incoming trunk is stored in incoming call memory.

Operator-assisted, special three-digit code, directory assistance calls, and equal access calls are not update outgoing call memory.

If a subscriber has a CLASS feature that requires incoming call memory and has Call Waiting as well, incoming call memory is updated when the subscriber hears the call waiting tone.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA64AA RES (Residential Enhanced Service) Base
NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature improves the operation of Automatic Recall/Automatic Callback and the Customer Originated Trace features.

Restrictions

There are no restrictions on the use of this feature.

Reference

FDOC AG1152

Package	NTXA82AA02 CLASS LINE OFFICE DATA
Feature set	BILLING
Feature	CLASS: USAGE SENSITIVE PRICING BILLING
Feature no	F7411

Synopsis

The CLASS Subscription Usage Sensitive Pricing (SUSP) Billing feature allows CLASS features to generate SUSP billing records.

Implementation

Before any CLASS feature can generate SUSP billing records, SUSP must be turned-on for the office. The new field, SUSP, in Table AMAOPTS is datafilled "ON" to turn-on SUSP billing in the office.

When a CLASS line option is added using SERVORD and SUSP has been assigned to the office, the system prompts for the suboption BILLING_OPTION. If AMA is datafilled in BILLING_OPTION, SUSP billing records are generated. If NOAMA is datafilled, no billing records are generated.

This feature adds two new call codes, 330 and 332, and two new structure codes, 1030 and 9015, for use by CLASS features for generating Bellcore format Automatic Message Accounting (AMA) records.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature generates billing records, on a per feature-usage basis, for the following CLASS features:

- * Automatic Call Back
- * Automatic Recall
- * Calling Number Delivery
- * Calling Number Delivery Blocking
- * Customer Originated Trace

Restrictions

This feature supports only Bellcore format AMA records.

Reference

FDOC AG1154

Package	NTXA84AA01 EBS - MUSIC ON HOLD
Feature set	SERVICES
Feature	MUSIC-ON-HOLD FOR EBS
Feature no	F2826

FEATURE SYNOPSIS

This feature provides music on hold from an Electronic Business Set (EBS) or an Integrated Voice and Data (IVD) set.

When an EBS or IVD set places a call on hold or autohold, the held party is connected to a customer defines audio source. When the EBS or IVD set user presses the DN key associated with the held DN line, the held party is disconnected from the audio source and reconnected to the EBS or IVD set DN line.

FEATURE DESCRIPTION

To initiate this feature the following datafill is needed:

The feature is assigned at the key set level in Table IVDINV for Integrated Voice and Data sets and in Table KSETINV for Electronic Business Sets.

The feature is assigned at the customer group level in Table CUSTSTN. The audio group is assigned in this table as well.

The feature is added to the set of features supported by the Audio Interlude facility through the addition of the Key Set Music On Hold (KSMOH) feature index in Table AUDIO.

The KSMOH audio route lists are assigned to the KSMOH audio groups in Table AUDIO.

Ref: FDOC AD0989

Package	NTXA89AA01 SMDR TIME DUMP FOR BNM
Feature set	ADMINISTRATION
Feature	RECORDING DATA TIMER DUMP
Feature no	G0120

Synopsis

This feature allows the DMS-100 or DMS-100/200 to dump SMDR data at customer-specified time intervals, rather than on the basis of a full buffer or scheduled transfer.

This permits timely and rapid accounting. For example, in the hotel/motel market, this rapid delivery prevents a guest from making a last minute call and checking out before the SMDR buffer is full and dumped.

Customers using the Business Network Management (BNM) system are able to use this feature.

Implementation

Table CRSFMT has two new fields. TIMERDMP is set to 'Y' to activate this feature. TIMerval contains the frequency of the dump in even numbers of seconds.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX562AA NOS - Data Collection
NTX560AA NOP - Generic RO Service (upgrade of NTX560AA)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

To be effective, any services or features that interact with this feature must also be in real time.

For NT format AMA or SMDR data, disk storage must be increased. This is not the case for Bellcore AMA data.

This feature is not available to customers who receive their SMDR information by tape or Revenue Accounting Office (RAO) services.

Reference: FDOC AF1456

NTXA90AA01

Status: LTD TOPS-MP TERMINAL HANDLER HIGH SPEED

TPC-S/W	:	
TERMINAL HANDLING S/W FOR TOPS MP		F5974
TPC DIAGNOSTICS		F5976
TPC DRIVERS		F5977
TPC TUTOR I/F		F5978
TPC DEBUG TERMINAL HANDLE		F5979
TPC SYSTEM SUPPORT		F5980
TPC ADMINISTRATION		F5981
TOPSMP1	:	
ENHANCED MAINTENANCE FOR TPC RACKMOUNT		F6508
TPC-S/W	:	
TPC HSDA SOFTWARE		F7068
TPC HSDA ROM		F7069
TPC HSDA DOWNLOADER		F7070
TPC HSDA DRIVER		F7071
TPC HSDA MAINTENANCE SERVER		F7072
TPC HSDA MAN MACHINE INTERFACE		F7073
TPC SERVICE INTERWORKING		F7074
TPC TAMI RESTRUCTURE		F7075
TPC MESSAGING		F7076
TPC MESSAGING HANDLER		F7077
REMOTE SONALERT FOR TOPS-MP		F7204
TPC S/W	:	
OPERATOR LOGON PASSWORD FOR TOPS-MP		F7210
HSDA DIAGNOSTICS		F7382

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TERMINAL HANDLING S/W FOR TOPS MP
Feature no	F5974

FEATURE SYNOPSIS

Provide the man-machine interface for the TOPS V TPC. Includes interface to alpha terminal, and encoding/decoding terminal commands from the CC and interfacing applications within the TPC with the OI (operator interfaces). It is also used by all applications version I and beyond that require access to the MP.

FEATURE DESCRIPTION

Terminal handling software consists of the OI. The OI resides between the lower level M4010 terminal i/o driver and the higher level application tasks that use the MP. Two major components of the OI are the TH and the TOPS call processing application.

The TH is the application independent core of the TPC. It is responsible for maintaining logical screen images for all of the screens, accepting screen update requests from applications, sending keyboard input to applications and switching screens whenever activity changes from one application to another ("context switching"). The TH also introduces conventions followed by all applications in the TOPS MP for creating and maintaining screens.

The call processing application uses the TH to perform screen handling for the TA, assistance, in-charge, and force management positions.

Keyboard:

The MP keyboard contains 126 keys including the standad QWERTY set, softkeys, customer definable hardkeys, call processing hardkeys, a dial pad, and undefined keys reserved for future applications. Keys are grouped conveniently to minimize the time spent typing. The call processing area is also highlighted by a shaded area to easily distinguish it from the rest of the keyboard.

Softkeys are a valuable addition to TOPS because they are context dependent. Applications can dynamically update them as state changes occur. Softkeys allow new key functions to be added without modifying the keyboard and reduce extraneous keying. These are two important advantages over TOPS IV.

MP Screen Formats:

Version one of TOPS MP implements screens for the TA, assistance, in-charge, and force management positions. These screens make use of the greyscales feature of the M4010.

The M4010 display matrix is 29 rows by 90 columns, five rows more than the usual 24 found on most displays. (Note: the number of columns may be reduced to 80 in order to provide a wider character matrix than the standard 8x12 that the M4010 currently supports.) The system status area appears in the top three rows and the eight softkeys are displayed in the bottom two rows. The remaining 24 rows provide standard screen dimensions for applications.

The call processing area contains several fields for displaying and entering toll and assist information such as calling/called numbers, and class charging.

A functions menu pops up in the menu and services selections whenever the functions key is hit. This menu contains a numbered list of functions. Using the numeric identifier the operator can select a desired function. Basically, the functions menu is a list of infrequently used "keys" such as logout or start timing that are not used often enough to be hardkeys. If the customer decides that some of the functions are important enough to be accessed as hardkeys six customer definable hardkeys can be assigned to functions listed in the functions menu. The functions also provides another way of adding new functions without having to modify the keyboard.

Note: The services menu is reserved for later phases of TOPS MP to gain access to local and remote database applications such as multileaf and directory assistance.

The forms area is used to display information such as charge, rate and route, or overseas information. The forms and functions areas overlap the lower right quadrant of the display.

Ref: F5972 TOPS MP OPERATOR POSITION I/F

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC DIAGNOSTICS
Feature no	F5976

FEATURE SYNOPSIS

This feature provides diagnostics for the TOPS position controller (TPC) hardware. It is used during testing for product verification, field support to diagnose and localize problems in the field, and the operating company's administration to verify the hardware when problems arise.

FEATURE DESCRIPTION

This feature tests the functioning of the following components:

- TOPS/HSLI card.
- Floppy drive, controller, and its parallel I/O interface.
- Winchester drive, controller, and its parallel I/O interface.
- MP terminal (software-generated screen patterns test the CRT display, a manual diagnostic tests the keyboard, and terminal component diagnostics test the base unit).

Note: Diagnostics for the processor card and memory card are implemented in and run from read only memory (ROM).

This feature is available either as a standalone software package run off a floppy disk or as part of the TPC application package under the control of TPC administration. The standalone package is for the installer running the diagnostics in the commissioning mode, or the administrator performing disk diagnostics. In both cases, diagnostics are chosen and invoked by means of a man-machine interface accessed through the TPC administration and maintenance interface (TAMI) port, on the TPC. There is a set of diagnostic tests for each major component of the TPC.

If the diagnostics are invoked from the TPC administration program (administrator mode), only those positions that are maintenance busy (at the MAP and TPC administration) are available for testing. Winchester and floppy diagnostics must be run from the standalone floppy set, thus requiring that all positions controlled by the TPC are maintenance busy.

If diagnostics are invoked by the installer (commissioning mode), all positions that have corresponding hardware present are available for testing, and the content changing (extensive) diagnostics for the Winchester and floppy components are also available.

Ref: BC2141, GFX731, NTP on TOPS MP Maintenance Reference Manual and Administration Reference Manual

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC DRIVERS
Feature no	F5977

FEATURE SYNOPSIS

Provides the interrupt handler and driver for four NT4X82AA cards, which contain the interface to the CC, Tutor III B and MP (4010) terminals.

FEATURE DESCRIPTION

TOPS MP offers a new generation of operator positions which use M4010 terminals. A M4010 can function as toll and assist, in charge, assistant or a force management position. In TOPS IV each type of position uses a separate terminal.

The TPC supports a hard disk of maximum capacity 80 megabytes, an eight inch floppy disk drive, and interfaces to command four M4010s, four DMS trunk pairs, up to four TUTOR IIIB's, a VT100 compatible terminal and a serial printer.

The software that control access to the external hardware devices resides in the TPC operating system. This software control access to the TUTOR IIIB, DMS-200 network and the four M4010s.

TPC drivers provides an optimum interface to the call processing application program. TPC drivers are responsible for transmitting data from the call processing application to an appropriate hardware device like TUTOR IIIB and vice versa.

Ref: BC2142, TOPS MP GENERAL DESCRIPTION FOR TPC

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC TUTOR I/F
Feature no	F5978

FEATURE SYNOPSIS

This feature integrates the existing Tutor 3B training system with TPS MP. It resides in the TPC and does not require any changes to the Tutor Training system.

FEATURE DESCRIPTION

The Tutor training system simulates live operator traffic by presenting calls to the trainee. Call voice and call data are stored on a cassette tape played by the Tutor. The Tutor processes the call data and presents the data to the TOPS terminal so that the screen updates are synchronized with the call voice, providing the trainee with a realistic call scenario.

Tapes:

The tapes are standard two-track cassette tapes. One track is used for data while the other track is reserved for voice. The call information containing voice and data is recorded on the tapes by the tape maker. The data is a processed version of a script that is generated by NT's training department, and the voice is that of actors reading the scripts.

Scripts:

In addition to containing the actors' words, the script contains the data to be displayed on the terminal, the synchronization information that is required for those displays, the the trainees expected keying actions with the Tutors reactions to the keying.

Tutor Interface Software (TIS):

In the TOPS IV system, the Tutor 3B communicates with the trainee using TOPS IV keystrokes (from the trainee) and TOPS IV commands (from the Tutor). With TOPS MP, there are additional commands that may be sent from the CC. To avoid making hardware changes in the Tutor, the TIS is required to integrate the function of the Tutor with the additional TOPS MP commands and the TOPS MP keyboard.

As previously mentioned, the Tutor training system simulates live operator traffic by presenting calls to the trainee. The call data, which contains the proper keystroke responses to the voice stimulus, is presented to TIS by the Tutor. TIS is responsible for determining if the trainee's keystrokes, which are presented to the TIS via the OI, are correct. If all stimulus response(s) are correct, the trainee advances to the next call segment. If the response(s) are incorrect, the expected response is pre-

sented to the trainee as a prompt to enter the correct keystrokes. The Tutor is informed of the mistake so that it can track the number of trainee errors.

Ref: BC2145

F5974 - TPC OPERATOR I/F & FM POSITION

F5981 - TOPS MP ADMINISTRATION

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC DEBUG TERMINAL HANDLE
Feature no	F5979

FEATURE SYNOPSIS

This feature provides an interface to a debug terminal including utilities for character conversion.

FEATURE DESCRIPTION

The TPC debug terminal handler provides some debugging tools for use by the designer and the field support personnel. This feature provides for the inputting and outputting of integers that can be accompanied by a descriptive phrase. An interface is also provided for the designer to use the debug terminal handler facilities for "custom" designer-supplied procedures, typically used for displaying data structures.

For debugging the multi-tasking software, the operating system kernel provides for task communication message buffering, thus guarantying that calls to the debug routines are not "blocked". The system software also provides routines for hexadecimal, decimal, string, and integer conversion to any of the other formats.

A form of program flow tracing is also provided. Debug statements of different depths can be activated by setting a debug level flag. Debug messages can be sent on a task basis down to changes in any variables.

Ref:

BC2146
F5974 Terminal Handling Software for TOPS MP
F5977 TPC Drivers
F5972 TOPS V Operator Position Interface
F5973 TOPS V Interface - Incharge, Assistant, Force Management

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC SYSTEM SUPPORT
Feature no	F5980

FEATURE SYNOPSIS

This feature provides TPC software:

1. Support for the TPC.
2. Read only memory (ROM) modification and additions.
3. Software initialization, supervision, error detection and recovery.

FEATURE DESCRIPTION

The ROM software in the TPC consists of the following:

1. Power-up (or reset) initialization of software including diagnostics that check the processor, the ROM image, and the RAM operation. If an error occurs a code is displayed on the LED display and an attempt is made to display an error message on the TOPS administration and maintenance interface (TAMI) terminal. The error message may not be displayed on the TAMI terminal if the nature of the error is such that the output software does not work properly.
2. Exception handling software for when ROM software is executing.
3. A ROM monitor that provides commands to display and change memory contents and access (virtual addressing), display and change processor register contents, a debug 68000 code, run diagnostics on TPC hardware, and the ability to boot-up the system.
4. Software to auto-boot the system after power-up or reset.

Initialization, Supervision, and Error Detection and Recovery:

The auto-boot feature of the ROM software loads the booting software from the boot track of the boot device. The booting software loads the operating system program (OSP) including the hardware drivers from the boot volume. The OSP then invokes the TPC supervisor program. The supervisor:

1. Creates the environment in which programs run.
2. Initially invokes the rest of the programs that comprise the TOPS TPC software.

3. Handles the termination of programs, generating log messages and re-starting the programs as required.

4. Processes requests from the TPC Maintenance and Administration program to start, stop, read attributes, write attributes, and query information for an operator position control (OPC) program.

Ref: BC2157, GFX731

NTP MP General Description and Administration Reference Manual

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC ADMINISTRATION
Feature no	F5981

FEATURE SYNOPSIS

TOPS MP consists of multiple TOPS Position Controllers (TPC), each providing four operator positions. This feature provides a TPC administration and maintenance interface (TAMI) for each TPC:

1. Installing initial and subsequent TOPS S/W releases.
2. Detecting and repairing hardware troubles.
3. Examining TPC error log messages.
4. Programming customer definable hard keys.
5. Providing remote access to the TPC.
6. Configuring positions for toll and assist, force management, in-charge and assistance.
7. Defining the out trunks service list.

FEATURE DESCRIPTION

TPC administration and maintenance is accessible locally via the TAMI port and remotely over telephone lines via an auto-answer modem plugged into TAMI port. These are referred to as the local TAMI and as the remote TAMI.

The administrator can examine the error logs generated and stored on the hard disk by the TPC from TAMI terminal. Error logs indicate which software component in the TPC detected the error and the cause of the error.

The TPC can hold a maximum of fifty log messages at a time. Exceeding this limit results in the overwriting of the least recent log messages. Log messages are not accessible from the DMS Maintenance and Administration Position (MAP). The Man Machine Interface (MMI) at the TAMI terminal includes commands for examining, printing and deleting error logs. To print error logs, a printer should be plugged into the printer port on the TPC and the appropriate print commands should be issued using the MMI.

Trouble Shooting:

When a TPC partially fails and some operator positions are still operational, the administrator can use the TAMI terminal to detect the problem and restart the operator positions after they have been repaired or replaced. Position, hard disk, and disk errors are considered partial failures of a TPC. When a complete TPC failure occurs and all the operator positions seem to malfunction, the administrator should power down the TPC and power it up again to reboot. All TPC hardware errors will then be displayed on the TAMI terminal during TPC booting. Detailed diagnostics

may be run if the information displayed on the TAMI terminal is insufficient and the problems still exist.

Programming Customer Definable Keys:

The TOPS MP operator interface involves using a pop-up window for call processing functions because some call processing functions are used more often than others. The operating company has the option of programming six hard keys to correspond to six frequently used call processing functions. Note all functions are still accessible through the pop-up window.

The MM at a TAMI terminal includes commands that allow an operating company administrator to program hard keys on one TPC and copy them to all his TPCs by using a floppy disk containing the hard key definitions. It is totally up to the operating company.

Remote Access:

Remote access allows those at remote sites to investigate a problem by dialing into the TPC using a VT100 compatible terminal configured at the baud rate of 1200 as a remote TAMI and checking TPC error logs. The NT Technical Assistance and Support group (TAS) can be a great help to the operating company by quickly detecting the problem and restarting the operator positions in error. The operating company should keep at least one 1200 baud modem with auto-answer feature to use for remote TAMI terminals.

Configuring TPC Positions:

TOPS office hostadministrative positions such as Force Management, In Charge and Assistance in addition to the toll and assist (regular operator) positions. These positions allow administrative activities to be distributed over several TPCs instead of to a TAMI terminal allowing administrative activities for its own TPC only. Each position is datafilled in the position configuration tables called TOPSPOS and TOPSDEV using the DMS CC MAP to be of toll and assist or of a particular administrative type.

While TOPS IV uses specialized positions for Force Management, In Charge and Assistance, the M4010 in TOPS MP can be configured to operate for toll and assist or for administration. In TOPS MP version 1, there is no mechanism for the DMS central control to inform a TPC of the configuration of its four M4010. However, a TPC administrator can use the TAMI on each TPC to define how each one of the M4010s is expected to be used. The administrator must be careful to maintain consistency with the configuration information defined in the DMS CC.

Defining Outtrunks Services List:

An OUTTRUNKS key on the MP keyboard allows frequently used numbers and emergency numbers to be dialed quickly by pressing the OUTTRUNKS key fol-

lowed by a number between 1 to 7. The services list is set up in the DMS CC from a MAP using the table OGTKEY.

The transfer keys can be assigned to the outtrunk keys 5 and 6.

Ref: BC2158
NTP 297-1001-510
GFX731

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TOPSMP1
Feature	ENHANCED MAINTENANCE FOR TPC RACKMOUNT
Feature no	F6508

FEATURE SYNOPSIS

TOPS Positive Controller (TPC) handles distribution of voice and data from the DMC Central Control (CC) and manages screen displays for up to four Multipurpose Positions (MP) in the TOPS MP system. At present, TPC houses four TOPS/HSLI cards, one per MP. The TPC main processor handles I/O (INPUT/OUTPUT) with each MP via the corresponding TOPS/HSLI card. This feature removes the restriction that locks up the TAMI while a print job is in progress.

FEATURE DESCRIPTION

TPC occupies a shelf in a PCE (position controller equipment), where each TPC consists of the following:

- 1-4 TOPS/HSLI cards (NX62AA)
- 1 parallel IO card (NX65AA)
- 1 memory card (NX63AA)
- 1 main processor card (NX64AA)
- 1 floppy disk drive (NX68AA)
- 1 hard disk drive (NX68BA)

Where parallel IO card provides interface to the floppy disk drive and the hard disk drive.

Ref: AF0732, NTP 297-2281-100

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC HSDA SOFTWARE
Feature no	F7068

Synopsis

This feature allows the Multi-Protocol Controller (MPC) software to be used by the high-speed data access (HSDA) on the TOPS Operator Position System (TPC).

The HSDA is a specialized card housed in the TPC. Each HSDA provides two high-speed data links (up to 64 kbps) to the TPC for data communication using standard protocols. The HSDA software provides directory assistance to the multipurpose position available on the TPC. The HSDA software provides BX.25 communication on both links at 56 kbps between the database vendor and the main processor on the TPC.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-Protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Datalink Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0721

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC HSDA ROM
Feature no	F7069

Synopsis

This feature provides system initialization and initialization diagnostics, status indication, invocation of specific diagnostics, application load downloading, application start-up, and fatal application error handling. The feature also includes a ROM monitor, which comprises a set of commands and facilities for low-level debugging assistance to the multipurpose position available on the tops position controller (TPC).

The TPC handles distribution of voice and data from the DMS CC and manages screen displays for up to four multipurpose positions in the TOPS MP system. The HSDA circuit board is designed so that the TPC provides data communications to external devices over two links with a capacity of up to 64 kbps. The software designed for this feature is programmed on the HSDA (high-speed data access) firmware.

This feature is the code for the EPROM storage of the HSDA and MSDA circuit packs, NTNX66AA and NTNX66BA.

Implementation

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTXA62AA TOPS MP DA/Audio Response
- NTX030BA TOPS ACD Features
- NTX134BA Remote Operator Centralization Data Link Handling
- NTX273AA Multi-Protocol Controller BX.25
- NTX645AA TOPS - Service Billing
- NTX724AA TOPS MP Interface
- NTX731AA TOPS Position Controller (TPC) Version I
- NTX871AA Remote TOPS MP OC Datalink Handling
- NTX892AA MPC Multilink Management
- NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0533

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC HSDA DOWNLOADER
Feature no	F7070

Synopsis

The HSDA downloader acts as a software transfer monitor between the TOPS position controller (TPC) and ROM maintenance on the HSDA circuit pack. This feature also sends a complete or fail message to indicate the status of the software transfer.

Implementation

TPC (TOPS position controller) logs record download errors.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-Protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Datalink Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The TPC has four HSDA cards. This feature can download only one circuit pack at a time.

There are no restrictions on the use of this feature.

Reference: FDOC AF0534

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC HSDA DRIVER
Feature no	F7071

Synopsis

This feature acts as an interface between the high speed data access (HSDA) downloader, the HSDA maintenance server, and the HSDA message handler. This feature provides the protocol used by the HSDA driver to communicate with these three devices as well as with the HSDA circuit packs.

In addition, this feature:

- * includes the power-up diagnostics on the shared RAM interface
- * allows the maintenance server to reinitialize the interface to the HSDA circuits and to execute interface diagnostics

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-Protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Datalink Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0535

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC HSDA MAINTENANCE SERVER
Feature no	F7072

Synopsis

This feature provides software for the following three maintenance functions of the high-speed data access (HSDA) circuit packs in the TPC.

This feature initializes HSDA circuit packs in a TPC by:

- * determining if circuit packs are present
- * verifying results of circuit-pack diagnostics

This feature provides maintenance of HSDA circuit packs to the TPC administration and maintenance interface (TAMI) by:

- * enabling, disabling and downloading HSDA circuit packs
- * enabling and disabling links
- * monitoring status of circuit packs and links
- * sending link configuration datafill to the HSDA circuit packs

This feature provides error reporting and recovery by:

- * reporting status changes in circuit packs, links, or conversations
- * reporting errors to the HSDA message handler and the TAMI
- * attempting HSDA circuit pack recovery if failures occur
- * generating error logs
- * performing audits to verify circuit pack status and attempting recovery if errors are detected

Implementation

TPC logs record software, hardware, and communications errors.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTXA62AA TOPS MP DA/Audio Response
 NTX030BA TOPS ACD Features
 NTX134BA Remote Operator Centralization Data Link Handling
 NTX273AA Multi-Protocol Controller BX.25
 NTX645AA TOPS - Service Billing
 NTX724AA TOPS MP Interface
 NTX731AA TOPS Position Controller (TPC) Version I
 NTX871AA Remote TOPS MP OC Datalink Handling
 NTX892AA MPC Multilink Management
 NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0536

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC HSDA MAN MACHINE INTERFACE
Feature no	F7073

Synopsis

This feature allows TOPS users to perform the following functions using a TAMI (TPC administration maintenance interface) terminal:

- * datafill the protocol parameters for high-speed data access (HSDA) links
- * control the status of HSDA links and cards
- * assign ARU language for the operator to use when releasing a call
- * assign timer values to DA service or ORDB (operator reference database) for software efficiency

Implementation

TPC logs record HSDA error conditions.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-Protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Datalink Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF1318

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC SERVICE INTERWORKING
Feature no	F7074

Synopsis

This feature provides the service interworking capabilities on TOPS MP positions. The following are introduced by this feature:

- * A new billing screen extends billing to services other than toll and assistance (TA).
- * A new services menu is added.
- * Interworking of service screens and the billing screen is provided.
- * TOPS MP menus are improved.
- * A software base for new services is included in this feature.

Implementation

To install TOPS MP, the host and all remotes must be upgraded to BCS24 or higher.

The active service is now displayed in the type field in the call processing area of the TA and billing screens.

Calls which require billing information, for example, ONI or ANIF calls, are presented in the billing screen. Otherwise, the service screen is presented. The operator is free to move between the two screens within a service, without loss of information, by keying billing-specific or service-specific keys. When the operator moves from one screen to the other, the functions on the keyboard change automatically. The operator cannot release a call for service if the billing information is incomplete.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTXA62AA TOPS MP DA/Audio Response
 NTX030BA TOPS ACD Features
 NTX134BA Remote Operator Centralization Data Link Handling
 NTX273AA Multi-Protocol Controller BX.25
 NTX645AA TOPS - Service Billing
 NTX724AA TOPS MP Interface
 NTX731AA TOPS Position Controller (TPC) Version I
 NTX871AA Remote TOPS MP OC Datalink Handling
 NTX892AA MPC Multilink Management
 NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The same softkeys displayed for 0+ calls are displayed for customer-defined calls.

Reference: FDOC AF0547

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC TAMI RESTRUCTURE
Feature no	F7075

Synopsis

This feature improves the TPC administration and maintenance position interface (TAMI). The TAMI MMI is now consistent through all screens. The following changes are introduced:

- * OGT (outgoing trunk) keys range from 0 to 99 with no restrictions on the location of the assistance key.
- * The position status 'Maintenance Busy' is now 'Manual Busy' (ManB).
- * The initial screen after a reset or reboot is the main menu, "TPC Administration and Maintenance".
- * The process for the user to transfer a TPC load from the floppy disks to the hard disk has been improved.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-Protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Datalink Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

All user input must be followed by a carriage return to input into TAMI.

Type-ahead is not allowed.

Printing of datafill is no longer available as a menu option. Instead, printing is done by displaying the datafill on the screen and pressing the PRINT SCREEN key in the upper left-hand corner of the keyboard.

Reference: FDOC AF1317

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC MESSAGING
Feature no	F7076

Synopsis

This feature is the messaging system for software in the TPC main processor. It includes communications between software in the TPC main processor as well as data buffer management and queuing facilities.

Implementation

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTXA62AA TOPS MP DA/Audio Response
- NTX030BA TOPS ACD Features
- NTX134BA Remote Operator Centralization Data Link Handling
- NTX273AA Multi-Protocol Controller BX.25
- NTX645AA TOPS - Service Billing
- NTX724AA TOPS MP Interface
- NTX731AA TOPS Position Controller (TPC) Version I
- NTX871AA Remote TOPS MP OC Datalink Handling
- NTX892AA MPC Multilink Management
- NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0746

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	TPC MESSAGING HANDLER
Feature no	F7077

Synopsis

This feature is low-level software that runs on the TPC main processor. It provides message handling and routing functions that allow the high-level application software to communicate with external devices and databases through the HSDA driver on the TPC. The message handler makes the link utilization more efficient by allowing multiple applications to access the same physical HSDA link. The message handler also accommodates data transfer between the application software and the HSDA driver.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-Protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Datalink Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF1319

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC-S/W
Feature	REMOTE SONALERT FOR TOPS-MP
Feature no	F7204

Synopsis

This feature activates a remote indicator (lamp or tone) to alert operator office administrative personnel of calls or trouble conditions that occur while they are absent from their their incharge (IC), assistance (ASST), or force management (FM) positions.

Implementation

The local sonalert tone sounds at the ASST, IC, or FM position in a force management center or traffic office under the following conditions:

- * all time and charges positions out of order
- * assistance request arrival
- * calls in queue-no position occupied
- * assistance request queued
- * calls deflected
- * CAMA suspended
- * transfer call in queue-no transfer position occupied
- * 25% controlled traffic

From the new TAMI screen the craftsperson can:

- * enable or disable the local or remote sonalert
- * turn on or off the local or remote sonalert

The following feature packages are necessary for this feature to operate in package NTXA90AA:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Data Link Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

The following feature packages are necessary for this feature to operate in package NTXA731A:

NTX000AA Bilge

NTX001AA Common Basic

NTX030BA TOPS ACD Features

NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

Pressing the STOP BELL softkey deactivates local sonalert. Deactivation is automatic if "calls deflected" caused the alert.

Remote sonalert on a TPC is activated if local sonalert is activated. The remote sonalert is deactivated when the last local sonalert on a TPC is deactivated.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

A multi-purpose position (MP) cannot respond to requests to turn its local sonalert on or off if the MP has not been loaded with the appropriate software.

Reference: FDOC AF1509

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC S/W
Feature	OPERATOR LOGON PASSWORD FOR TOPS-MP
Feature no	F7210

Synopsis

This feature provides an optional log-on password in addition to the operator identification log-on number for the TOPS MP position. This provides the operating company with additional security.

Implementation

Valid passwords consist of four to seven alphanumeric characters. The password entry field appears at the TOPS MP logon menu.

Users may modify passwords when they are in the "position busy" state.

Password usage is controlled at the FADS (force administration data system) or TADS (traffic office administration data system).

Office parameter TOPS_PASSWORD_ENABLE in table OFCENG is set to "Y" to activate this feature.

The following feature packages are necessary for this feature to operate in package NTXA90AA:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTXA62AA TOPS MP DA/Audio Response
- NTX030BA TOPS ACD Features
- NTX134BA Remote Operator Centralization Data Link Handling
- NTX273AA Multi-protocol Controller BX.25
- NTX645AA TOPS - Service Billing
- NTX724AA TOPS MP Interface
- NTX731AA TOPS Position Controller (TPC) Version I
- NTX871AA Remote TOPS MP OC Data Link Handling
- NTX892AA MPC Multilink Management
- NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

The following feature packages are necessary for this feature to operate in package NTXA731A:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX030BA TOPS ACD Features
- NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

This feature is not supported by the TOSS (traffic operator simulation system) and training features. In order to run TOSS, the password option must be disabled.

Reference: FDOC AF1463

Package	NTXA90AA01 TOPS-MP TERMINAL HANDLER HIGH SPEED
Feature set	TPC S/W
Feature	HSDA DIAGNOSTICS
Feature no	F7382

Synopsis

This feature allows user access to diagnostic functions for high-speed data access (HSDA) circuit packs in a TOPS position controller (TPC). These functions can be performed either from the TPC administration and maintenance interface (TAMI) or with assistance from the diagnostic floppy disks that can be loaded into the TPC.

Basic and extensive diagnostics are provided by this feature. Basic diagnostics reset the HSDA circuit pack, causing tests of shared memory, command, and status registers and test of communications between the TPC main processor and the HSDA circuit pack. Extensive diagnostics check the HSDA ROM completely.

Implementation

The diagnostics main menu now includes a HSDA diagnostics selection, with a HSDA diagnostics menu.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTXA62AA TOPS MP DA/Audio Response
- NTX030BA TOPS ACD Features
- NTX134BA Remote Operator Centralization Data Link Handling
- NTX273AA Multi-Protocol Controller BX.25
- NTX645AA TOPS - Service Billing
- NTX724AA TOPS MP Interface
- NTX731AA TOPS Position Controller (TPC) Version I
- NTX871AA Remote TOPS MP OC Datalink Handling
- NTX892AA MPC Multilink Management
- NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF1723

NTXA91AA01 Status: LTD STANDARD INTERFACE FOR DA/INTERCEPT APPL

TPC-S/W	:	
DA APPLICATION		F7078
TPC DA APPLICATION - CCI		F7079

Package	NTXA91AA01 STANDARD INTERFACE FOR DA/INTERCEPT APPLICATIONS
Feature set	TPC-S/W
Feature	DA APPLICATION
Feature no	F7078

Synopsis

This feature implements the man-machine interface for call presentation and operator handling of directory assistance (DA) calls, DA database search interactions, and DA billing.

This feature interacts with the operator position, the DMS CC, and the directory assistance vendor's gateway to provide DA capabilities at the TOPS MP position. High-level logic is implemented to handle communications between the TOPS position controller (TPC) and the CC and between the DA gateway and the operator position.

The following DA call types are provided by this feature:

- * 411
- * 555-hom (555-1212 calls from this number plan area (NPA))
- * 555-for (555-1212 calls from another NPA)
- * 555 (undifferentiated)
- * 131 (calls from another operator)
- * DA-Rcl (recall)

The following intercept call types are provided by this feature:

- * int-ONI
- * int-ANIF
- * int-Cut
- * Int-Rcl
- * Int-Spl

The following statistics are collected:

- * logon to logoff time for each operator session
- * call duration
- * operator activities within a call

Implementation

Log TPC100 has new text "Directory Assist", which may appear in the TPC log report field. The following new text may appear in the log text field:

- * TPC to Gateway Login timeout on MP m
- * Link Switch on MP m
- * Unable to perform Link Switch on MP m
- * Gateway login failure received on MP m
- * Msg system requested appl to stop sending on MP m

Where m is the MP number 0, 1, 2 or 3

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX090AA Coin Services

Activation and Deactivation

Operators servicing DA calls are automatically connected to the CCI gateway at logon.

System information is passed between the TPC, CC, and gateway to initialize all three nodes for call processing during logon.

The operator can continue in manual mode in the event of link failure between the CC and gateway while the TPC is processing DA calls.

Softkeys are associated with either localities or NPAs for DA and intercept call types respectively. Softkeys default to localities when the operator enters an administrative search session, or when undefined call types are presented to the DA service.

New withhold softkey allows the operator to with-hold calls while in the activities screen.

DA-specific hardkeys are activated when a call is presented to the DA service. Keys are provided to move the cursor between DA input fields, to request database searches, to request database paging during a search, and to request audio announcement of listings.

Control and alternate shifted keys are used to provide a means to perform functions from the home row when the DA service screen is displayed.

The operator can search a DA database while servicing a DA or intercept call by entering information in the input fields and pressing the DA search hardkey or the control key counterpart.

The operator can search an intercept database while servicing a DA or intercept call by entering the called number and NPA in the input fields and pressing the Intercept hardkey or the control key counterpart. The call is released to an audio announcement. The operator can override the release by entering a D after the called number.

The operator relays information to the subscriber verbally or by audio announcement.

Multiple requests can be handled. The operator can exit the current service and go to a new service or answer additional requests. Billing information is retained if the operator switches between DA and TA.

There are two methods to complete a call once a listing has been found: semi-automatic and manual. For semi-automatic call completion, the operator enters the line designator of the listing in the DA screen and then selects the TA service. The gateway sends the requested number to the CC for AMA. For manual call completion, the operator writes down the called number and selects the TA service, then enters the called number at the TA screen.

The service assistant (SA) presses the Monitor Pos or Monitor Opr softkey followed by the position or operator number to enter the monitor mode. The Quit Mon softkey is used to quit monitoring.

Interactions

Two new screens are introduced in conjunction with this feature. They are described in F7074 TPC MP Services Interworking.

- * billing screen is used for input of billing information
- * DA screen is used to interact with external databases

Limitations

Performing a DA service on an intercept call cannot be billed.

Busy Verify, Notify, Request CAMA, Transfer IC, Time and Charges, Overseas, Start Timing, Cancel Timing, Person Call Back, Access Loop 2, and Hold are displayed on hardkeys and in menus, but are not available in the DA service.

Only one DA call can be at a position at any one time.

The SA must be datafilled with the services of the operator or position being monitored.

Reference: FDOC AF0540

Package	NTXA91AA01 STANDARD INTERFACE FOR DA/INTERCEPT APPLICATIONS
Feature set	TPC-S/W
Feature	TPC DA APPLICATION - CCI
Feature no	F7079

Synopsis

This feature is one of several that provide TOPS position controller (TPC) to Computer Console Inc. (CCI) messaging for the directory assistance (DA) application. It provides TPC-CCI messaging for the directory assistance application. This feature fulfills the requirements of the TPC-CCI messaging specification and handles the application-level software side of messaging with base-level software.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX090AA Coin Services

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0970

Package	NTXE00AA01 TOPS OPERATOR PASSWORD
Feature set	ADMINISTRATION
Feature	TOPS OPERATOR PASSWORD
Feature no	F7178

FEATURE SYNOPSIS

This feature provides an operator logon password system to improve TOPS security.

FEATURE DESCRIPTION

The operator logon password system provides the following:
password enforcement when logging on to a TOPS position
the ability for operators to alter their own passwords
password administrative functions such as: resetting passwords, and disabling logon attempts to designated operator numbers.

Logon Procedure

The logon procedure has two stages. The operator logs on with an operator number. If the operator number is valid, the operator enters an associated password. If the password is valid the operator is considered to be logged in and may handle calls.

If an invalid password is entered during a logon attempt a report is generated at the Traffic Office Administration (TADS) TTY. A report is also generated if a logon attempt is made by an operator number that has been deactivated.

Altering an Operator Password

Operators may change their own passwords. If the new password is accepted, an acknowledgement is sent to the operator that the password has been changed.

Password Administration

The password administration system is multi-tiered.

Each team of operators has a Team Administrator who can perform administrative functions on the passwords of the operators in that team.

A group of Team Administrators has a Force Administrator who can perform administrative functions on the passwords of the operators and Team Administrators in their hierarchy.

Ref: FDOC AG0931

DMS ALL BCS27 Feature Description Manual	890124
NTXE32AA01	Status: LTD CCS7 PREVENTATIVE CYCLICAL RETRANSMISSIO
SATELLITE PREVENTATIVE CYCLICAL RETRANSMISSION	: F6975
Section B Available Features	NTXE32AA01
Page 373	

Package	NTXE32AA01 CCS7 PREVENTATIVE CYCLICAL RETRANSMISSION
Feature set	SATELLITE
Feature	PREVENTATIVE CYCLICAL RETRANSMISSION
Feature no	F6975

FEATURE SYNOPSIS

This feature allows the Operating Company to select the Preventative Cyclic Retransmission (PCR) method of error correction on a CCS7 signaling link basis. This capability applies only to CCS7 signaling links using a CCS7 Link Interface Unit (LIU) type peripheral.

FEATURE DESCRIPTION

This feature adds two fields to the refinement for the LIUBASIC selector in Table C7LINK. These new fields indicate if Preventative Cyclic Retransmission is to be used for error correction.

Ref: FDOC AC0222

DMS ALL BCS27 Feature Description Manual		890124
NTXE39AA01	Status: LTD CALL FORWARD BUSY/DON'T ANSWER SPLITS	
FEATURES	:	
CALL FORWARD BUSY/DON'T ANSWER-INTERNAL/EXTERNAL SPLIT		G0127
Section B Available Features	NTXE39AA01	Page 375

Package	NTXE39AA01 CALL FORWARD BUSY/DON'T ANSWER SPLITS
Feature set	FEATURES
Feature	CALL FORWARD BUSY/DON'T ANSWER-INTERNAL/EXTERNAL S
Feature no	G0127

Synopsis

This feature provides MDC users with the option of having call forward busy (CFB) and call forward don't answer (CFD) features forwarded to the DN of their choice. The DN to which a call is routed depends on whether the incoming call is in the same or a different customer group than the MDC line.

Electronic business set (EBS) users have the additional option assigning DNS to the following features:

- * CFU call forward universal
- * CFI call forward intragroup
- * CFF call forward fixed
- * CFB call forward busy
- * CFD call forward don't answer

Three methods of executing the features are provided: default, fixed, and programmable.

Implementation

Table KSTFEAT has three new options: CFUIF (call forward universal, intra-group, and fixed), CFB, and CFD. CFB and CFD can be internal (same customer group as base) or external. Entries to KSETFEAT with existing option CFX are now split into CFUIF, CFB, and CFC.

Table IBNFEAT has new internal and external CFB and CFD options.

Table CFX has internal and external CFBDN and CFDDN.

Table IBNXLA can now include unique access codes for activation and deactivation of CFB and CFD.

SO commands ADO, DEO, CHF, CHG, and NEW are used to indicate whether CFB and CFD options for an MDC line are default, fixed, or programmable. The system prompts with the keylist for each of default, fixed, and programmable methods of executing the feature.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

NTX100AA Integrated Business Networks - Basic (IBN)
NTX413AA IBN - Cut Through Dialing
NTX901AA Local Features I

Activation and Deactivation

Feature access codes are used to activate and deactivate internal and external DNs for CFB and CFD.

Interactions

CFB cannot be used with hunt groups.

Speed call cell number cannot be used as remote station's DN for CFB/CFD fixed and programmable methods.

Only the primary member of a multiple appearance directory number (MADN) is able to program, activate, or deactivate CFB/CFD internal and external DNs for the group.

Call forward validation (CFWVAL) is compatible with CFB/CFD programmable methods for internal and external DNs.

If an attendant console extends a call to a station with CFB/CFD internal and external DNs, then:

- * the call is forwarded to the internal DN if the call is in the same customer group family as the CFB/CFD station
- * the call is forwarded to the external DN if the call is in a different customer group family than the CFB/CFD station

The multicfb/multicfd feature allows more than one call to be forwarded if the station has the CFB/CFD option.

The call forward simultaneous (CFS) feature is available on a per line basis.

Limitations

Separate keylist does not support a different forward DN for each DN key on a keylist. As well, both internal and external DNs share the same keylist.

CFRA and CFS can only be datafilled through the CFUIF option. CFS applies to all DNs on the set with any type of call forwarding. CFRA only applies to DNs with CFU, CFI, or CFF.

Internal and external DNs are not supported for CFU, CFI, and CFF.

Activation and deactivation of this feature with feature keys on the EBS is not available.

Reference: FDOC AG1371

DMS ALL BCS27 Feature Description Manual	890124
NTXE60AA01	Status: LTD DATAPATH - CLOSED USER GROUPS (U.S.)
ENHANCEMENTS CUG FOR THE US MARKET	: F2996
Section B Available Features	NTXE60AA01
Page 379	

Package	NTXE60AA01 DATAPATH - CLOSED USER GROUPS (U.S.)
Feature set	ENHANCEMENTS
Feature	CUG FOR THE US MARKET
Feature no	F2996

Synopsis

The Datapath Closed User Group (CUG) for United States Market feature is a security feature that enables Data Unit users in the U.S. to form a virtual private group in order to restrict access between the group and outside users. This feature allows various CUG regions to operate independently, and also provides controlled access between these regions. This feature allows CUG to be used by the many telephone companies in the United States and permits a CUG to spread beyond the boundary of a telephone company.

Implementation

This feature is implemented by datafilling the office parameter US_CUG_ENABLED in Table OFCOPT with "Y".

CUG numbers consist of two parts: CUG region, and CUG ID. This feature adds a new office parameter, CUG_REGION, to Table OFCSTD to datafill the CUG region. The value of CUG_REGION is selected by Northern Telecom, and cannot be altered by the operating company. The CUG ID is datafilled in field CUGID in Table KSETFEAT.

Access between CUGs of the same or different regions is provided through datafill in Table CUGCOMP.

CUG checking is performed to determine if a call should be allowed. This checking has been extended to include a check of the CUG group as well as the CUG ID.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks (IBN) - Basic
NTX106AA IBN - Proprietary Business Set
NTX250AA Datapath - Basic
NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

Modem Pooling and CUG are mutually exclusive.

Reference

FDOC AC0461

NTX000AA13 Status: RTM BILGE

ADMINISTRATION	:	
2.75 MW PROGRAM STORE		F3862
MAINTENANCE	:	
SANITY CHECK OUT		F3884
ADMINISTRATION	:	
FEATURE PACKAGE IN SOS		F3888
MAINTENANCE	:	
GENERALIZED MAP CAPABILITY		F5710
ADMINISTRATION	:	
MAP LEVEL FOR NOP		F5835
MAINTENANCE	:	
OPTIMIZE MTCCLASS TASKS		F6191
TOLL	:	
SUPER CC SYNC AND LDMATE		F7088
MAINTENANCE AND TESTING	:	
MTCBASE PERFORMANCE ENHANCEMENTS		F7208

Package	NTX000AA13 BILGE
Feature set	ADMINISTRATION
Feature	2.75 MW PROGRAM STORE
Feature no	F3862

FEATURE SYNOPSIS

This feature enables the maximum program store size on the CPU shelf to be increased to 2.75 MW.

FEATURE DESCRIPTION

This feature allows the new 512 K word memory card (NT3X93ZZ) and 1 M word card (NT4X80AA) to be used on NT3X41 processor/memory shelves with NT3X94 memory controllers, thereby increasing the memory capacity to 2.25 and 2.75 M words, respectively.

Ref: FDOC BC1321

Package	NTX000AA13 BILGE
Feature set	MAINTENANCE
Feature	SANITY CHECK OUT
Feature no	F3884

FEATURE SYNOPSIS

This feature is a continuation of the improved BCS Application (Warm Swact) project, and further enhances the ability of the Warm Swact software to detect possible causes of failure prior to initiating the switch of activity.

FEATURE DESCRIPTION

The RESTARTSWCT command is upgraded to accept an optional parameter. This provides the option to either proceed as is now, or to invoke all checking provided by this feature.

Once checking is invoked, the following is done:

The status of all nodes (but not cc nodes) is checked (not just pm nodes). All nodes must be 'ok' or 'offline' for Warm Swact to proceed. If this check passes, the warm swact process is started, else the appropriate message appears at the terminal.

Prior to the switch of activity, the Warm Swact process will perform the following check on BCSn side.

All nodes, network links and network junctors are classified as 'in-service' or 'out of service', where 'in-service' means ok, cbsy, or pbsy. 'Out of service' means any other state.

The same thing is done on BCSn+ side, with the exception that sysbsy nodes are classified as in-service.

The results are then compared, and if a mismatch is detected a log is produced and Warm Swact aborts at this point.

Finally, a new command is added to provide the operator the ability to list all mismatches. This is the DISP command, and requires one non-optional parameter.

The DISP command is set up to display information resulting from Warm Swact, and replaces the present SWCTTIME command, (see MM section for details).

Package	NTX000AA13 BILGE
Feature set	ADMINISTRATION
Feature	FEATURE PACKAGE IN SOS
Feature no	F3888

FEATURE SYNOPSIS

DMS software feature package information is made available on the switch.

FEATURE DESCRIPTION

Software for the DMS switch is sold as Northern Telecom feature packages. Information about these packages will be made available on the switch.

HOW THE SWITCH ACQUIRES PACKAGE INFORMATION

NT package information will be stored and updated in the DMS source code library. This information will be passed on to the switch via the modlist file. The modlist file is read by the LOAD command. The LOAD command will check for package information and, if found, store it in the internal tables. The package information will include its name, code (NT package code) and the list of packages needed by the package named. Initially the NT package code in the modlist will be ignored. The reason for this is that the implementation can only handle a one-to-one mapping of name to code. Whereas PLS may specify many NT package codes for a single PLS package.

EFFECT ON RESTARTS

DMS switches at customer sites comprise a select portion of the possible NT feature packages. However, superset loads are available in the lab that include all packages.

Once the switch has acquired package information, it will be possible to restart the switch with only the packages specified being restarted. This will provide an efficient way to simulate field loads.

It will also allow testers to restart the minimum set of packages required to test a feature. This will ensure that no invalid dependencies remain in the code. For most of the test sessions it will be necessary for several testers to work together. In this event, all of the packages required by the testers can be restarted without the whole load being restarted.

EFFECT AT THE CUSTOMER SITE

The list of feature packages at a customer site will be built automatically into the load. This will eliminate error and allow the list of packages to be readily queried.

Software Package - NTX001AA

Ref: FDOC BC0988

Package	NTX000AA13 BILGE
Feature set	ADMINISTRATION
Feature	MAP LEVEL FOR NOP
Feature no	F5835

FEATURE SYNOPSIS

The MAP software is made more general to pave the way for future applications. One of these applications will be to display the MAP on a device other than a locally connected console.

FEATURE DESCRIPTION

The MAP software is altered to:

1. Eliminate the need for the application code that registers MAP updates to do real time breaks;
2. Uncouple knowledge of displaying the MAP from the console driver software;
3. Allow the MAP device driver to a) be event driven by the MAP software and, b) poll the MAP software for updates at its own speed.

Any visible impact of this feature will be limited to the order and the speed of MAP updates. Following this feature the capability to display the MAP on devices other than consoles will be possible with less design effort.

Ref:

BC1302 FDOC

Package	NTX000AA13 BILGE
Feature set	MAINTENANCE
Feature	OPTIMIZE MTCCLASS TASKS
Feature no	F6191

FEATURE SYNOPSIS

This feature will reduce maintenance class CPU occupancy by implementing a background process MTCBKGP, to handle new peripheral maintenance audits and other non-urgent maintenance tasks.

- implementing maintenance base overload control to avoid excessive CPU usage.

FEATURE DESCRIPTION

This feature will reduce MTCMAINP CPU occupancy due to routine maintenance. This will be achieved as follows:

1. Background process MTCBKGP:

A process MTCBKGP will be introduced which is similar to MTCMAINP but runs in background class. MTCBKGP will handle all new peripheral maintenance audits (XPMS and LCMs) any any non-urgent maintenance tasks.

2. Maintenance Base Overload Controls:

Better overload controls for maintenance base will be provided. These are required in order to avoid excessive CPU usage by maintenance base when it runs out of resources.

Ref: DDOC BC2300

Package	NTX000AA13 BILGE
Feature set	TOLL
Feature	SUPER CC SYNC AND LDMATE
Feature no	F7088

FEATURE SYNOPSIS

This feature speeds up the Central Control synchronization (CC SYNC) and the load mate (LDMATE) processes.

FEATURE DESCRIPTION

With this feature the matching, copying and synchronizing steps to the SYNC command are all covered at once. If a difference is found in the Program Store (PS) at the matching stage, a 16K block of memory is copied rather than the whole memory card, thereby increasing the speed of the CC SYNC process. The NOMATCH option of the sync has been changed so that if this option is set, an attempt is made to synchronize the switch without trying to match or copy the PS.

The LDMATE process is more efficient. The tasks of writing data to the mate side and replying when the task is finished have been overlapped.

Ref: FDOC AG0089

Package	NTX000AA13 BILGE
Feature set	MAINTENANCE AND TESTING
Feature	MTCBASE PERFORMANCE ENHANCEMENTS
Feature no	F7208

Synopsis

This feature improves execution of MTCBase. The modular structure and the abort strategy are improved.

Implementation

This is a prerequisite feature to permit MTCBase logs to print user information instead of MTCBase information.

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AG1239

NTX001AA21 Status: RTM COMMON BASIC

MAINTENANCE AND TESTING	:		
INPUT COMMAND SCREENING		I/O PORT RESTRICTIONS	F0010
ADMINISTRATION	:		
BASIC DATA MODIFICATION SYSTEM		DATA VALIDITY CHECKS	F0011
INTERFACES	:		
INTERFACE TO		S-C TURRET - VISUAL INDICATORS	F0013
INTERFACE TO		S-C SCAMA OPER POSN-ONI/ANIF	F0015
TRUNK TYPES	:		
ANALOG		SWITCHBOARD TRUNKS	F0016
SIGNALING AND SUPERVISION	:		
TRUNKS -		E&M	F0021
TRUNKS -		REVERSE BATTERY	F0022
TRUNKS -		SF	F0023
TRUNKS -		HI-LO	F0024
MAINTENANCE AND TESTING	:		
TESTLINES		100 ORIGINATING & TERMINATING	F0026
TESTLINES		101 ORIGINATING & TERMINATING	F0027
TESTLINES		102 ORIGINATING & TERMINATING	F0028
TESTLINES		103 ORIGINATING & TERMINATING	F0029
INTERFACES	:		
INTERFACE TO		MODIFIED N.E. TSD FOR ONI	F0033
INTERFACE TO		STROMBERG-CARLSON TURRET -ONI	F0034
SWITCHING AND TRANSLATION	:		
OUTGOING TRUNK IDLE SELECTION			F0039
MAINTENANCE AND TESTING	:		
OUTPUT ROUTING AND REPORTING			F0040
SIGNALING AND SUPERVISION	:		
TRUNKS -		DELAY DIAL	F0041
MAINTENANCE AND TESTING	:		
INTEGRITY CHECKING, CONTINUITY & FACILITY CHECKS ON TRUNKS			F0042
SIGNALING AND SUPERVISION	:		
TRUNKS -		IMMEDIATE DIAL	F0043
TRUNKS -		STOP-GO	F0044
VARIABLE INTER-DIGITAL TIMING			F0045
TRUNKS -		WINK START	F0047
TRUNK TYPES	:		
DIGITAL		DS-1 BIT RATE	F0052
SIGNALING AND SUPERVISION	:		
DETECTION OF		ANSWER SUPERVISION	F0055
DETECTION OF		DISCONNECT	F0056
GLARE RESOLUTION			F0057
TRUNK GUARD TIMING			F0058
DETECTION OF		HIT	F0059
RING BACK			F0061
RING FORWARD			F0062
TRUNKS -		REMOTE MAKE BUSY	F0063
MAINTENANCE AND TESTING	:		
ALARMS THRESHOLDING OF CRITICAL RESOURCES(MFR,DTR)			F0065
TRUNK TYPES	:		

ANALOG	TOLL CONNECTING	F0066
INTERFACES	:	
INCOMING TEST TRUNK FROM AECO	LOCAL TEST DESK	F0068
MAINTENANCE AND TESTING	:	
PER CALL TRUNK TESTING		F0070
ADMINISTRATION	:	
BASIC DATA MODIFICATION SYSTEM	COMMAND EDITING	F0077
BASIC DMO SYSTEM(ADD,DEL,MOD)	FEATURES	F0078
BASIC DMO SYSTEM(ADD,DEL,MOD)	LINE EQUIPMENT NO. (LEN)	F0079
BASIC DATA MODIFICATION SYSTEM	PROMPTED & UNPROMPTED INPUT	F0080
BASIC DMO SYSTEM(ADD,DEL,MOD)	SERVICES	F0081
BASIC DMO SYSTEM(ADD,DEL,MOD)	OFFICE DATA-TRANSLATION	F0082
BASIC DMO SYSTEM(ADD,DEL,MOD)	OFFICE DATA-TRUNK GROUPS	F0083
BASIC DMO SYSTEM(ADD,DEL,MOD)	OFFICE DATA-TRUNKS	F0084
REMOTED ADMINISTRATION		F0092
BASIC OPERATIONAL MEASUREMENT	-SELECTIVE PRINTOUT	F0093
SERVICES	:	
INTERCEPTED CALL ROUTED TO	ANNOUNCEMENT	F0094
INTERCEPTED CALL ROUTED TO	OPERATOR	F0095
INTERCEPTED CALL ROUTED TO	STONE	F0096
MACHINE ANNOUNCEMENTS	ANALOG	F0097
ORIGINATING AND TERMINATING SERVICE		F0098
DIALING AND DIALING PLAN	:	
DDD ACCESS (+1)		F0099
SERVICE CODE N11		F0100
LOCAL DIALING		F0101
NORTH AMERICAN CODE FORMAT		F0102
OPERATOR 0-		F0103
SWITCHING AND TRANSLATION	:	
RECEIVE/OUTPUT PULSE UP TO 15 DIGITS		F0104
INTERFACES	:	
INTERFACE TO	3CL SWITCHBOARD	F0108
INTERFACE TO	CAMA SWITCHBOARDS	F0109
MAINTENANCE AND TESTING	:	
ALARMS	VISUAL ON FRAMES/AISLES	F0110
INTERFACES	:	
MAGNETIC TAPE HANDLER 1600 BPI		F0112
1200 BAUD DIAL-UP DATA PORT		F0114
MAINTENANCE AND TESTING	:	
ALARMS	AUDIBLE/VISUAL	F0115
ALARMS	DEAD OFFICE ALARM	F0116
ALARMS	MAJOR MINOR CRITICAL	F0117
AUTO BUSY OUT OF FAULTY SUB-UNIT		F0118
BUSY OUT/IDLE EQUIPMENT		F0119
INTEGRATED CO COMMUNICATIONS		F0121
ADMINISTRATION	:	
BASIC DMO SYSTEM(ADD,DEL,MOD)	DIRECTORY NUMBERS (DN)	F0123
MAINTENANCE AND TESTING	:	
LINE/TRUNK STATUS QUERY OR DUMP		F0126
MAINTENANCE POSITION	DIAL-UP ACCESS	F0128
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Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	INPUT COMMAND SCREENING	I/O PORT RESTRICTION
Feature no	F0010	

DESCRIPTION

This feature allows the telco to restrict command usage on the basis of terminal identity instead of userid. Terminal restriction is achieved by allowing only one userid to be associated with the terminal. The restrictions applicable to the userid are therefore also applicable to the terminal.

A terminal is restricted to one userid by setting the name of the terminal in table TERMDEV (see 297-1001-451, 1/008) to a valid userid. The userid can be restricted to the desired commands by the use of the PRIVCLAS command.

When login is attempted from the restricted terminal, (depress the BREAK key then, after the question mark appears, type in LOGIN), the terminal is automatically logged in with the same userid as specified in TERMDEV and there is no prompt for userid and password. If the userid is not known in the system, the terminal behaves in the normal fashion and a prompt for userid and password is issued.

To change the terminal restrictions, any of the following methods can be used:

- Change the command classes the user is allowed access to, by use of the PERMIT command. The change becomes effective immediately.
- Change the class of a command to a class the userid is allowed access to, by the use of the PRIVCLAS command. This change is not effective until after the next warm restart.
- Change the terminal name in table TERMDEV to a userid which has the desired restrictions. This can be done only after the terminal has been logged off and placed in the offline state.

To restore the normal function of the terminal, one of the following methods can be used:

- The terminal name in table TERMDEV can be changed to a name which is not defined as a userid. The command SHOW USERS displays all the userids currently defined.

- Remove the userid from the system by the use of the command UNPERMIT. The terminal will still have the name it was given in table TERMDEV but, since the name is no longer a valid userid, the terminal is no longer restricted.

TABLE A

DUMPSAFE COMMAND_NAMES AND PROGRAM_NAMES

DESCRIPTION	COMMAND_NAME	PROGRAM_NAME
Basic MAP Commands	MAPCI	
	MTC	
TTP Commands	QUIT	TTP
	POST	TTP
	SEIZE	TTP
	TTPMAN	TTP
	DIAGN	TTP
	TLTEST	TTP
	CKTLOC	TTP
	HOLD	TTP
	NEXTH	TTP
	NEXTP	TTP
	NEXTA	TTP
	SAVE	TTP
	MONITOR	TTP
TTPMAN Commands	MW	TTP
	LOSS	TTP
	NOISE	TTP
	TO NEDEF	TTP
	TO NEGEN	TTP
	JACK	TTP
	HEADSET	TTP
	OUTPUL	TTP
	RLSCONN	TTP
	ONOFFHK	TTP
	RNGBF	TTP
TTP Monitor Commands	MONPOST	TTP
	MONLINK	TTP
	CALLTRF	TTP
	CKT	TTP
LTP Commands	LNS	
	LTP	
	QUIT	LTP
	POST	LTP
	BUSY	LTP
	RTS	LTP
	DIAGN	LTP
	CKTLOC	LTP
	HOLD	LTP
	NEXTH	LTP

NEXTP LTP
PREFIX LTP

LTPLTA Commands	LTPLTA MONLTA LTPLTA TALKLTA LTPLTA LNTST LTPLTA ORIG LTPLTA VDC LTPLTA VAC LTPLTA RES LTPLTA CAP LTPLTA LTA LTPLTA COIN LTPLTA RING LTPLTA DGTST LTPLTA
LTPMAN Commands	LTPMAN LOSS LTPMAN NOISE LTPMAN TONEGEN LTPMAN JACK LTPMAN RLSCONN LTPMAN
ALT Commands	ALT DEFINE ALT RUN ALT STATUS ALT CANCEL ALT SDIAG ALT DIAGN ALT LIT ALT

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DATA MODIFICATION SYSTEMDATA VALIDITY CHECKS
Feature no	F0011

DESCRIPTION

Data Validity Checks

Extensive use is made of validity and error checks and system safeguards to avoid functional input errors which may cause a loss of translation data integrity. Failure to pass the checks will abort the order (command) and output an error message to the operator. This error message is in sufficient detail to identify clearly the reason for failure. Diagnostic message and/or related data are output on the printer or VDU screen.

These responses provide the operating personnel with three types of information:

- a) confirmation that the information was accepted
- b) indications as to why the information was rejected
- c) requests for further information, if required

Package	NTX001AA21 COMMON BASIC		
Feature set	INTERFACES		
Feature	INTERFACE TO	S-C TURRET - VISUAL	
Feature no	F0013		

SEE FEATURE NUMBER F0108

Package	NTX001AA21 COMMON BASIC		
Feature set	INTERFACES		
Feature	INTERFACE TO	S-C SCAMA OPER POSN-	
Feature no	F0015		

SEE FEATURE NUMBER F0108

Package	NTX001AA21 COMMON BASIC		
Feature set	TRUNK TYPES		
Feature	ANALOG	SWITCHBOARD TRUNKS	
Feature no	F0016		

DESCRIPTION

THE DMS SYSTEM IS COMPATIBLE WITH THE FOLLOWING SYSTEMS: (IT SHOULD BE NOTED THAT NOT EVERY ASPECT OF INTERWORKING WITH THE SYSTEM LISTED BELOW WILL BE BUT RATHER THAT THE DMS DESIGN ASSURES COMPATIBILITY ON AN "AS REQUIRED" BASIS. DMS HAS AN INTRINSIC FLEXIBILITY SO THAT COMPATIBILITY MAY BE EFFICIENTLY CARRIED OUT AT THE TRUNK CIRCUIT AND SOFTWARE LEVEL WITHOUT MAJOR DESIGN CHANGES).

A) SWITCHING SYSTEMS:

SXS
 #1 X-BAR
 #5 X-BAR INCLUDING N5-1 AND N5-2
 #1 ESS
 CROSSBAR TANDEM
 4A CROSSBAR, AND 4A CROSSBAR ETS
 SA-1 CROSSBAR
 SF-1 CROSSBAR
 SP-1 4 WIRE ESS
 SP-1 2 WIRE ESS
 SP-1 2 WIRE LOCAL/TANDEM ESS
 #4 ESS
 #1 EAX
 LM ERICSSON ARK 523
 *DMS-1 (DMS-100 ACTING AS CENTRALIZED CONTROLLER)
 DIGITAL INTERFACE
 *DMS-10
 *DMS-100/200/300

B) ANCILLARY SYSTEMS:

THE DMS SHALL BE CAPABLE OF INTERCONNECTING WITH SUPPORTING SYSTEMS PRESENTLY IN USE.

#3, 3C, 3CL SWITCHBOARDS
 #1, 3, 7 INFORMATION DESKS
 #23 OPERATING DESKS (WITH AND WITHOUT DACS)
 #2 REPAIR DESK
 #6 SERVICE OBSERVING SET
 #14 LOCAL TEST DESK
 #3 TEST CABINET
 #6A ANNOUNCEMENT SYSTEMS
 CALRS

AUDICHRON
TOPS (SP-1 4W)
REFERENCE

NTP 297-1001-152 - TRUNK SELECTION AND COMPATIBILITY

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - E&M
Feature no F0021

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC		
Feature set	SIGNALING AND SUPERVISION		
Feature	TRUNKS -	REVERSE BATTERY	
Feature no	F0022		

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC		
Feature set	SIGNALING AND SUPERVISION		
Feature	TRUNKS -		SF
Feature no	F0023		

SEE FEATURE NUMBER F1100

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - HI-LO
Feature no F0024

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC		
Feature set	MAINTENANCE AND TESTING		
Feature	TESTLINES	100	ORIGINATING & TE
Feature no	F0026		

DESCRIPTION

Refer to AT&T Notes on Distant Dialing for a definition of the test lines 100-103.

To perform test lines test, the TTP level is first accessed (MAPCI -> MTC -> TRKS -> TTP). One of the menu commands of TTP level display is TLTest which include T100, T102 and T103. (T101 is not a test. Strictly speaking it is a communication line. As such it is not mentioned in TLTest). These commands are used to request a test on the trunk under the TTP control position.

To provide terminating test line facilities, the DMS machine must be provisioned with the proper hardware. The software is a standard offering. The terminating test lines are treated as trunks and are given pseudo CLLI codes. Terminating test lines translation tables have to be filled in to implement the feature.

Package	NTX001AA21 COMMON BASIC		
Feature set	MAINTENANCE AND TESTING		
Feature	TESTLINES	101	ORIGINATING & TE
Feature no	F0027		

SEE FEATURE NUMBER F0026

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	TESTLINES	102 ORIGINATING & TE
Feature no	F0028	

SEE FEATURE NUMBER F0026

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	TESTLINES	103 ORIGINATING & TE
Feature no	F0029	

SEE FEATURE NUMBER F0026

Package NTX001AA21 COMMON BASIC
Feature set INTERFACES
Feature INTERFACE TO MODIFIED N.E. TSD FO
Feature no F0033

SEE FEATURE NUMBER F0108

Package	NTX001AA21 COMMON BASIC
Feature set	INTERFACES
Feature	INTERFACE TO STROMBERG-CARLSON TU
Feature no	F0034

DESCRIPTION

Calls requiring operator identification of the calling number (ONI) are routed to an operator at a Stromberg Carlson ONI Turret or to Stromberg Carlson #3 Toll Switchboard, when traffic loads are high. If all positions are busy and/or not available, the call is entered into a calls waiting queue (with or without ringing). Any call entered into the queue will remain there until either a position becomes available, or the call times out (25 sec.). If the calls waiting queue is full, the call will be switched to an overflow tone. When call is in the calls waiting queue the (ONI-CW) lamps at all the ONI positions will light.

When a call is routed to an available position the operator receives an indication as to the nature of the call (ANIF or ONI) via the ONI lamp. (Steady burn-in for ONI, flashing for ANIF) The operator will challenge the subscriber via the speech path and then key the digits (MF) to DMS via the pulsing path. If the keyed number is not accepted by DMS the (KP-BACK) lamp at the position will flash, as a re-order indication. The operator is expected to operate (KP-BACK) key which will send a re-set tone (700+1700 Hz) to DMS. The operator rechallenges the subscriber, and re-keys the digits. If the number is valid the position will release and be available to serve other calls.

If trouble on a call is encountered the operator can operate the (CANCEL CALL) key to force the release of the position, the associate subscriber will be switched to overflow by DMS.

Provisions to allow the operator to make the position busy via the (MAKE-BUSY) key and the re-set after recognition of an error by operating the (KP-BACK) key, are also included.

The #3 toll switchboards that are arranged for ONI operation will function in the same manner as described with exception of the following additions:

- 1) The operator must: return to normal the (ONI-CW) key, connect the position cord circuit to the (ONI) JK and have her headset plugged-in, to initiate the position available signal to DMS.
- 2) The talk-key must also be operated to close the speech path from the jack to her headset.

Signalling Requirements

POSITION

AVAILABLE: Grd on 'PT' lead from Pos indicating operator headset and MF key-set are attached.

SEIZURE: Grd on 'S1' lead from 2X65 'T & R' leads cut through to operator 'KPT-KPR' cut through to MF key set.

CALL

INDICATION: ONI - Grd on 'OI' lead from 2X65
- Grd on '1+' lead to position

ANIF - Grd on 'IF' lead from 2X65
- Interrupted Grd on '1+' lead to position

CHALLENGE AND

REGISTRATION: MF digits are sent to DMS via pulsing path.

ERROR

CORRECTION: - Grd on 'KPBK' lead from position
- Re-set signal consisting of 700 & 1700 Hz MF tones sent to DMS via 'KPT & KPR' leads, for a duration of at least 140 msec.

RE-ORDER: - Reversal on 'T & R' leads from 2X65
- Interrupted grd on 'KPBL' lead to position

RE-SET: - Same as error correction

RELEASE: - Keyed digits accepted, open on 'S1' lead from 2X65
- Open on '1+' lead to position
- position idle

FORCED

DISCONNECT: - Momentary Grd on 'CAL' lead from position.
- Momentary open on 'PO' lead to 2X65.
- Position idle (after release of key).

POSITION

BUSY: - Momentary Grd on 'MBK' lead from position.
- Open on 'PO' lead to 2X65.
- Grd on 'MBL' lead to position.
- Position made busy.

RE-STORE

FROM BUSY: - Momentary Grd on 'MBK' lead from position.
- Res Bat on 'PO' lead to 2X65.
- Open on 'MBL' lead to position.
- Position IDLE.

REFERENCES

S-440810 ONI TURRET
S-441251 ONI LINK CKT
S- POS ADAPTER CKT
GS 2X65AA CAMA POS SIGNALLING CKT
GS 2X66AA CAMA CALLS WAITING CKT
GS 5X74AA UNIVERSAL CAMA POS CKT
GS 5X77AA AUXILIARY CAMA POS CKT

Package NTX001AA21 COMMON BASIC
Feature set SWITCHING AND TRANSLATION
Feature OUTGOING TRUNK IDLE SELECTION
Feature no F0039

DESCRIPTION

THIS FEATURE ENABLES DMS TO SELECT THE OUTGOING TRUNK OR THE OUT- GOING PORTION OF A TWO-WAY TRUNK ON A MOST IDLE OR LEAST IDLE BASIS.

THE MOST IDLE OR THE LEAST IDLE OPTION IS TELCO SPECIFIABLE ON A TRUNK BASIS.

Package NTX001AA21 COMMON BASIC
Feature set MAINTENANCE AND TESTING
Feature OUTPUT ROUTING AND REPORTING
Feature no F0040

DESCRIPTION

A) DMS LOGS SYSTEM

IN DMS, OUTPUT REPORTS ARE CREATED BY THE INDIVIDUAL DMS SUBSYSTEM SOFTWARE AND ARE TRANSMITTED TO A HISTORY FILE, CALLED LOGS. THE LOGS SYSTEM IN TURN STORES THIS REPORT INFORMATION IN A LOG BUFFER DEDICATED TO THAT SUBSYSTEM. THERE ARE AS MANY LOG BUFFERS AS THERE ARE SUBSYSTEMS WHICH GENERATE REPORTS. IN ADDITION TO BEING LOGGED, THE OUTPUT REPORT IS ALSO FORWARDED TO AN OUTPUT DEVICE. THE ROUTING OF REPORTS IS CONTROLLED BY THE ROUTING AND REPORTING SYSTEM.

THE LOG BUFFERS ARE OF SUFFICIENT SIZE TO HOLD SEVERAL HOURS OF SUBSYSTEM REPORTS AT PEAK OUTPUT RATES. THE NUMBER OF REPORTS WHICH CAN BE HELD IS DETERMINED BY THE VALUE OF OFFICE PARAMETER LOG_CENTRAL_BUFFER_SIZE (SEE 297-1001-451, 1/024). THE ORDER IN WHICH REPORTS APPEAR IN A BUFFER IS THE SAME AS THE ORDER IN WHICH THEY ARE GENERATED. ONCE A SUBSYSTEM BUFFER IS FULL, THE NEXT REPORT THAT IS GENERATED DISPLACES THE OLDEST REPORT IN THAT BUFFER (E.G., A PUSH-POP TYPE MECHANISM). THE REPORT DISPLACED IS LOST UNLESS IT IS ROUTED TO SOME TYPE OF PERMANENT STORAGE DEVICE (E.G., A MAGNETIC TAPE).

THERE ARE SEVERAL COMMANDS THAT ALLOW TELCO PERSONNEL TO INTERROGATE THE CONTENTS AND DISPLAY PARTICULARS OF THE LOGS SYSTEM. THE COMMANDS ALLOW:

- SELETING A LOG OF A PARTICULAR SUBSYSTEM FOR INSPECTION
- DISPLAYING THE NEWEST OR OLDEST ENTRY
- DISPLAYING THE PREVIOUS OR NEXT ENTRY IN A LOG
- DELETING OR ERASING THE LOG CONTENTS OF A PARTICULAR LOG
- DISPLAYING THE LOGS CURRENTLY DEFINED IN THE SYSTEM
- DISPLAYING NEW REORTS AS THEY ARE GENERATED AT A MODIFI-
ABLE SCAN RATE
- DISPLAYING EITHER THE NORMAL OR AN ABBREVIATED FORM OF AN
OUTPUT REPORT B) REPORT ROUTING

A REPORT IS A RECORD OF AN EVENT THAT CONTAINS USEFUL INFORMATION FOR MAINTENANCE OR ADMINISTRATIVE PURPOSES. EXAMPLES OF EVENTS ARE: AN EQUIPMENT FAULT, A CHANGE IN STATE OF A PIECE OF EQUIPMENT, THE FAILURE OR SUCCESS OF A TEST. FOR FURTHER DETAILS OF EVENT TYPES, REPORT STRUCTURE, AND SPECIFIC REPORT FORMATS, REFER TO 297-1001-510.

EVERY TYPE OF REPORT THAT CAN BE GENERATED IS ASSIGNED A SINGLE CLASS NUMBER ON EITHER AN INDIVIDUAL REPORT BASIS, OR ON A LOG NAME BASIS. ALL DEVICES CAN BE ASSIGNED ONE OR MORE CLASS NUMBERS. A REPORT IS SENT TO AN I/O DEVICE ONLY IF THE REPORT CLASS MATCHES ONE OF THE CLASSES ASSIGNED TO THE I/O DEVICE. EACH I/O DEVICE CAN BE ASSIGNED AN ALTERNATE (BACKUP) DEVICE TO WHICH REPORTS ARE SENT WHEN THE MAIN TERMINAL DEVICE IS NOT OPERATIONAL. A SINGLE I/O DEVICE CAN BE THE ALTERNATE FOR ONE OR MORE I/O DEVICES IN THE SYSTEM. THE SPECIFICATION OF AN ALTERNATE DEVICE IS DONE IN TABLE LOGDEV. IF THE NUMBER OF REPORTS A DEVICE HAS TO HANDLE IS VERY LARGE, THE OFFICE PARAMETER LOG_DEVICE_BUFFER_SIZE CAN BE CHANGED TO ACCOMODATE THE LARGER NUMBER OF REPORTS.

THE ASSIGNMENT OF OUTPUT REPORT CLASSES IS USUALLY GOVERNED BY THE ASSIGNED FUNCTION OF THE I/O DEVICE IN QUESTION. THE PROCESS OF CLASSIFICATION BY MEANS OF REPORT CLASSES PREVENTS OPERATING GROUPS WITH DIFFERENT RESPONSIBILITIES WITHIN THE TELEPHONE COMPANY (TELCO) ORGANIZATION FROM INTERFERING WITH EACH OTHER. IT IS ADVISABLE THAT THE REPRESENTATIVES OF ALL CONCERNED OPERATING GROUPS BE CONSULTED TO ENSURE THAT THE ASSIGNMENT OF REPORT CLASSES AND INPUT COMANDS MEETS THE REQUIREMENTS OF EACH GROUP. (SEE USER RESTRICTED SCREENING)

THE ASSIGNMENT OF REPORTS TO CLASSES IS INITIALLY TRANSMITTED BY THE TELCO TO NORTHERN TELECOM LIMITED (NTI) FOR DATA FILLING VIA INPUT FORMS 2320, THE LOG DEVICE TABLE RECORD, AND 2321, THE LOG CLASS TABLE RECORD. ONCE THE INITIAL DATA IS COMPLETED, THE TELCO CAN MODIFY THE ASSIGNMENTS EITHER ON A TEMPORARY OR PERMANENT BASIS.

A SOFTWARE MODULE CALLED LOG UTILITY (LOGUTIL) PROVIDES THE MECHANISM FOR CONTROLLING, ON A TEMPORARY BASIS, THE ROUTING OF REPORTS TO THE VARIOUS INPUT AND OUTPUT (I/O) DEVICES (SEE 297-1001-153). IT ALSO MAINTAINS A HISTORY LOG, OR HOLDING AREA, OF ALL REPORTS GENERATED BY THE VARIOUS SUBSYSTEMS, AND PROVIDES THE MEANS FOR INTERROGATING AND SEARCHING THIS HISTORY LOG. PERMANENT MODIFICATIONS ARE ACCOMPLISHED BY MEANS OF THE TABLE EDITOR COMMANDS (297-1001-310) TO THE TWO ROUTING AND REPORTING CUSTOMER DATA TABLES: LOGCLASS AND LOGDEV (SEE 297-1001-451, 1/004).

ON EVERY SYSTEM RESTART, REPORT ROUTING IS REESTABLISHED TO

ALL DEVICES AS INDICATED IN THE DATA TABLES AND ANY TEMPORARY REPORT ROUTING CHANGES THAT WERE INITIATED PRIOR TO THE RESTART ARE CLEARED.

THE FOLLOWING ARE COMMANDS AVAILABLE TO OUTPUT ROUTING AND REPORTING SYSTEM:

I) ROUTING COMMANDS

ADDREP IO-DEV REP-LIST	- ADDS A REPORT TO THOSE PRINTED BY A DEVICE.
DELREP IO-DEV REP-LIST	- DELETES A REPORT FROM THOSE PRINTED BY A DEVICE.
ADDCLASS IO-DEV CLASSES	- ADDS CLASSES TO THOSE PRINTED BY A DEVICE.
DELCLASS IO-DEV CLASSES	- DELETES CLASSES FROM THOSE PRINTED BY A DEVICE.
REROUTE IO-DEVS	- REROUTE ALL REPORTS TO THE RESPECTIVE BACKUPS.
RESETROUTE	- RESET ALL ROUTING INFO TO THAT IN LOGCLASS AND LOGDEV.
CLASS CLASS REP-LIST	- SET REPORTS TO A NEW CLASS.

II) REPORT GENERATION COMMANDS

SUPPRESS REP-LIST	- SUPPRESS REPORTS.
RESUME REP-LIST	- RESUME REPORTS THAT ARE SUPPRESSED.
STARTDEV IO-DEVS	- START THE SPECIFIED DEVICES.
STOPDEV IO-DEVS	- STOP THE SPECIFIED DEVICES.
RESET	- RESUME ALL SUPPRESSED REPORTS AND SET ALL THRESHOLDS TO ZERO.
RENUMBER	- ASSIGN A NUMBER TO REPORTS THAT DON'T HAVE A NUMBER.
THRESHOLD N REP-LIST	- OUTPUT AFTER NTH REPORT ONLY.
TIMERESET HOURS REP-LIST	- TIME LIMIT BEFORE AUTOMATIC RESET OF THRESHOLD COUNTS.

III) OTHER COMMANDS

LISTROUTE CLASS CLASSES DEVICE IO-DEVS	REPORT REP-LIST
	- LIST ROUTING INFO FOR CLASSES.
	- LIST ROUTING INFO FOR DEVICES.
	- LIST ROUTING INFO FOR REPORTS.
LISTDEVS	- LIST STATUS OF EACH LOG DEVICE KNOWN TO THE LOG SYSTEM.
BACKUP IO-DEV BY IO-DEV	- ASSIGN BACKUP DEVICE.
DELDEVICE IO-DEV	- DELETE DEVICE FROM LOG SYSTEM.
LISTTIME	- LIST ALL REPORTS THAT ARE ON A RESET SCHEDULE.

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - DELAY DIAL
Feature no F0041

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	INTEGRITY CHECKING, CONTINUITY & FACILITY CHECKS ON
Feature no	F0042

DESCRIPTION

DURING THE INITIAL CALL SET UP TO ANOTHER SWITCHING SYSTEM, A SIGNAL INTEGRITY CHECK IS MADE. FOR TRUNKS WITH DELAY DIAL OR WINK START THE CHECK IS FOR THE CORRECT RESPONSE FOR THE DISTANCE OFFICE. FOR LOOP, REVERSE BATTERY SUPERVISION TRUNKS THE CHECK IS FOR CIRCUIT CONTINUITY AND CORRECT POLARITY ON THE TIP AND RING.

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - IMMEDIATE DIAL
Feature no F0043

SEE FEATURE NUMBER F1100

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - STOP-GO
Feature no F0044

SEE FEATURE NUMBER F1100

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature VARIABLE INTER-DIGITAL TIMING
Feature no F0045

DESCRIPTION

THE INTERDIGITAL TIME IS THE INTERVAL FROM THE END OF THE LAST ON-HOOK PULSE OF ONE DIGITAL TRAIN OF DIAL PULSES TO THE BEGINNING OF THE FIRST ON-HOOK PULSE OF THE NEXT DIGIT TRAIN.

IN DMS, THIS INTERDIGITAL TIMING IS VARIABLE AND TELCO SPECIFIABLE. THE RANGE VARIES FROM 70 MSEC TO 1000 MSEC FOR DP (BY STEP OF 10 MSEC.) AND A FIXED 7.0 MSEC FOR MF.

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - WINK START
Feature no F0047

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC		
Feature set	TRUNK TYPES		
Feature	DIGITAL	DS-1 BIT RATE	
Feature no	F0052		

DESCRIPTION

DMS CAN ACCOMODATE ANY MIX OF ANALOG AND DIGITAL TRUNKS UP TO A TOTAL OF 60,000. THE TREND IN FUTURE IS TOWARDS INCREASING DIGI- TIZATION OF THE NETWORK.

DMS INTERFACES DIRECTLY WITH A PCM SPAN LINE AT THE DS-1 RATE, WITHOUT THE NEED FOR CHANNEL BANKS.

DIGITAL TRUNKS CAN BE INCOMING, OUTGOING OR 2-WAY.

TRUNKS ARE USUALLY GROUPED INTO TRUNK GROUPS. DMS CAN ACCOMODATE UP TO 2048 TRUNK GROUPS WITH UP TO 1024 TRUNKS IN EACH TRUNK GROUP.

Package	NTX001AA21 COMMON BASIC		
Feature set	SIGNALING AND SUPERVISION		
Feature	DETECTION OF	DISCONNECT	
Feature no	F0056		

SEE FEATURE NUMBER F0059

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature GLARE RESOLUTION
Feature no F0057

DESCRIPTION

THE OPERATING COMPANY WILL BE ABLE TO INPUT BY DMO THE MANNER IN WHICH THE NEXT TRUNK IS SELECTED FOR EACH TWO WAY TRUNK GROUP. THE OPTIONS WHICH MAY BE SELECTED ARE:

- A) MOST IDLE
- B) LEASE IDLE

THE OPTION SELECTED BY THE TELCO IS DEPENDENT UPON THE WAY THE TRUNKS ARE SELECTED BY THE INTERFACING SWITCHER. THUS SIMULTANEOUS SEIZURES FROM BOTH ENDS ARE NORMALLY PREVENTED UNLESS ONLY ONE IDLE TRUNK REMAINS IN THE GROUP.

WHEN A TRUNK IS SEIZED AT BOTH ENDS SIMULTANEOUSLY, DMS WILL BE ABLE TO:

- A) IDENTIFY THAT THIS HAS OCCURRED,
- B) IF THE OFFICE IS DESIGNATED AS THE "CONTROLLED END", DMS WILL DISENGAGE FROM THIS BLOCKING CONDITION AND PERMIT THE "CONTROLLING END" TO PROCEED WITH THE CAL ATTEMPT. THE "CONTROLLED END" WILL PROCEED THROUGH THE NORMAL STEPS (ANOTHER TRUNK, ANOTHER ROUTE, ALL TRUNKS BUSY).

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNK GUARD TIMING
Feature no F0058

DESCRIPTION

OUTGOING TRUNKS RETURNED TO IDLE FROM EITHER CALL PROCESSING OR MAINTENANCE ACTION ARE SUBJECTED TO GUARD TIMING TO ALLOW THE DISTANT OFFICE TO RELEASE PRIOR TO RE-SEIZURE BY DMS. TRUNK GUARD TIMING CAN BE SPECIFIED ON A TRUNK GROUP BASIS IN THE RANGE 0 TO 2550 MS IN 10 MS STEPS.

Package NTX001AA21 COMMON BASIC
 Feature set SIGNALING AND SUPERVISION
 Feature DETECTION OF HIT
 Feature no F0059

DESCRIPTION

A) HITS: ANY TEMPORARY CHANGE OF STATE (ON-HOOK OR OFF-HOOK) WHICH DOES NOT PERSIST LONG ENOUGH TO BE RECOGNISED AS A VALID AND LEGITIMATE INFORMATION OR SUPERVISORY SIGNAL IN THE SIGNALLING PROTOCOL DURING A NORMAL CALL PROCESSING IS CONSIDERED AS A HIT. DMS WILL INCREMENT THE APPROPRIATE REGISTER WHENEVER A HIT IS ENCOUNTERED.

B) DISCONNECT: DISCONNECT TIMING IS TELCO SPECIFIABLE. THE TELCO CAN SELECT FROM A RANGE OF VALUES AS FOLLOWS:

TIMING	RANGE	INCREMENT	DEFAULT VALUE
-----	-----	-----	-----
CALLING PARTY DISCONNECT	0.16 SEC	0.15 - 2.0 SEC	0.01 SEC
CALLED PARTY DISCONNECT	10 SEC	0.2 - 32 SEC	0.1 SEC

ANY ON-HOOK SIGNAL WITH DURATION EXCEEDING THE TELCO SPECIFIED DISCONNECT TIMINGS WILL BE TREATED BY DMS AS LEGITIMATE DISCONNECT SIGNAL.

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature RING BACK
Feature no F0061

DESCRIPTION

THE RINGBACK SIGNAL IS APPLIED BY AN OPERATOR AT A SWITCHBOARD OR TOPS OR TSPS POSITION BY OPERATING A RINGING KEY. THIS ENABLES THE OPERATOR TO RECALL THE ATTENDANT AT A HOTEL OR MOTEL PBX TO SUPPLY TIME AND CHARGE INFORMATION FOR IMMEDIATE BILLING OF A COMPLETED CUSTOMER'S CALL. IT ALLOWS THE OPERATOR TO RECALL A COIN CUSTOMER WHO HAS GONE ON-HOOK WITHOUT PAYING OVERTIME CHARGES.

DEPENDING UPON THE TRUNK CIRCUIT DESIGN AND THE SWITCHING SYSTEM, THE RINGBACK SIGNAL SENT MAY BE 20 HZ RINGING ON T&R CONDUCTORS, AN ON-HOOK WINK, A GATE OPENING ON-HOOK FOLLOWED BY INBAND M:F: TONES, OR BY A TRAIN OF ON-HOOK WINKS, KNOWN AS MULTIWINK SIGNAL.

AS AN END OFFICE, DMS IS CAPABLE OF RECOGNIZING THE RINGBACK SIGNAL AND SENDS RINGING TO THE COIN LINE WHOSE CONNECTION IS STILL HELD.

AS A TOLL OFFICE, DMS IS ABLE TO REPEAT THE RINGBACK SIGNAL OR CONVERT TO A RECALL SIGNAL ON THE ORIGINATING OPERATOR'S CORD LAMP.

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature RING FORWARD
Feature no F0062

DESCRIPTION

THIS IS A SIGNAL USED BY AN OPERATOR AT THE CALLING END TO RECALL AN OPERATOR AT THE CALLED END ON AN ESTABLISHED CONNECTION. ON TRUNKS ARRANGED FOR USE WITH E&M LEAD SIGNALLING SYSTEMS, RELAYS IN THE OUTGOING TRUNK EQUIPMENT GENERATE A SINGLE ON-HOOK PULSE FOR EACH PULL OF THE RINGING KEY. AS APPLIED TO DISTANCE DIALLING CIRCUITS, RING FORWARD IS A MOMENTARY ON-HOOK OF 100 +_30 MILLISECONDS TRANSMITTED TOWARD THE CALLED END (50 TO 140 MILLISECONDS RECEIVED) WHICH IS CONVERTED AT THE DESTINATION OFFICE TO A RECALL SIGNAL ON THE OPERATOR'S ANSWERING CORD.

DMS WILL BE CAPABLE OF PASSING THE MOMENTARY ON-HOOK PULSE TO RECALL THE CALLED OPERATOR WITHOUT AFFECTING THE TIMING (100 +_ 30 MS) OF THE SIGNAL.

REFERENCE

AT&T NOTES ON DISTANCE DIALLING

Package	NTX001AA21 COMMON BASIC		
Feature set	SIGNALING AND SUPERVISION		
Feature	TRUNKS -	REMOTE MAKE BUSY	
Feature no	F0063		

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	ALARMS THRESHOLDING OF CRITICAL RESOURCES (MFR, DTR)
Feature no	F0065

DESCRIPTION

The telephone company can specify, as part of the office data, the 1% of trunks or service circuits in group which can be removed from service before an alarm (major, critical or minor) is displayed at the MAP.

Package NTX001AA21 COMMON BASIC
Feature set TRUNK TYPES
Feature ANALOG TOLL CONNECTING
Feature no F0066

SEE FEATURE NUMBER F0805

Package	NTX001AA21 COMMON BASIC
Feature set	INTERFACES
Feature	INCOMING TEST TRUNK FROM AECO LOCAL TEST DESK
Feature no	F0068

SEE FEATURE NUMBER F0108

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	PER CALL TRUNK TESTING
Feature no	F0070

description

per call trunk testing detects incoming and outgoing trunk irregularities which may occur during the processing of a call, such as:

1) for incoming trunks

hits, permanent signal, partial dial, mutilated digit, false start pulse, false key pulse, extra digit.

2) for outgoing trunks

integrity check failure, false supervision, unexpected stop-go, revised trunk (polarity), flash.

as a result of detected irregularities, trunks will be showered to test for high failure rate. detection of a possible trunk fault (i.e., failure of shower test) will result in a diagnostic test being carried out on the suspect trunk. if the trouble is confirmed, the circuit will remain out of service and the trouble register will be incremented. these tests provide the necessary fault resolution to differentiate between a dms trouble (e.g, circuit pack) and an external trouble (e.g., open facility).

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DATA MODIFICATION SYSTEMCOMMAND EDITING
Feature no	F0077

DESCRIPTION

Subscriber and office data are added, deleted or changed using Table Editor facility which is an online editing system. The operating company can also perform DMO using File Editor facility. In File Editor, so long as the commands are not filed, they can be edited/corrected without impacting on the actual customer tables. Service Order (SO) and Pending Order File (POF) have also command editing capability in the sense that lines of commands can be queried and changed before they are activated.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DMO SYSTEM(ADD,DEL,MOD) FEATURES
Feature no	F0078

SEE FEATURE NUMBER F0123

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DMO SYSTEM(ADD,DEL,MOD) LINE EQUIPMENT NO. (
Feature no	F0079

SEE FEATURE NUMBER F0123

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DATA MODIFICATION SYSTEMPROMPTED & UNPROMPT
Feature no	F0080

DESCRIPTION

DMS will prompt for further input if more is required but at the same time allows an experienced craftsperson to bypass the prompting altogether by using certain Table Editor commands. Field names of a tuple that require input values may be specified. Once specified the user merely inputs the corresponding values for those field names, or field numbers on one line of input, employing the required Table Editor command. Any fields not specified following the PROJECT command will take on preset default values.

REFERENCES

NTP 297-1001-115
NTP 297-1001-310

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DMO SYSTEM(ADD,DEL,MOD) SERVICES
Feature no	F0081

SEE FEATURE NUMBER F0123

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRANSLAT
Feature no	F0082

SEE FEATURE NUMBER F0123

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRUNK GR
Feature no	F0083

SEE FEATURE NUMBER F0123

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DMO SYSTEM(ADD,DEL,MOD) OFFICE DATA-TRUNKS
Feature no	F0084

SEE FEATURE NUMBER F0123

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	REMOTED ADMINISTRATION
Feature no	F0092

DESCRIPTION

MAP is used both for maintenance and administration purposes.

As MAP can be remoted, there is not problem in providing remote administration facility to operating companies. Remote administration, therefore, is provided via remote MAP on a dial-up or dedicated communication basis.

Package	NTX001AA21 COMMON BASIC
Feature set	SERVICES
Feature	INTERCEPTED CALL ROUTED TO ANNOUNCEMENT
Feature no	F0094

DESCRIPTION

INTERCEPT FACILITIES PROVIDE FOR THE ROUTING OF CALLS WHICH CAN- NOT BE COMPLETED DUE TO SUBSCRIBER, SWITCHING NETWORK, MACHINE IRREGULARITIES OR IMPOSED RESTRICTION. CALLS UNDER SUCH CONDI- TIONS WILL BE DIVERTED TO TONE (120 IPM), RECORDED OR OPERATOR.

INTERCEPT CONDITIONS RECOGNIZED BY THE DMS SWITCH ARE:

UNAUTHORIZED CAMA MISDIRECTED CAMA VACANT CODE TRUNK GROUP OVERFLOW NO CIRCUIT EMERGENCY ANNOUNCEMENT PRMANENT SIGNAL PARTIAL DIAL MUTILATED DIG- ITS INTEGRITY FAILURE HARDWARE MALFUNCTION

Package	NTX001AA21 COMMON BASIC
Feature set	SERVICES
Feature	INTERCEPTED CALL ROUTED TO OPERATOR
Feature no	F0095

SEE FEATURE NUMBER F0094

Package	NTX001AA21 COMMON BASIC		
Feature set	SERVICES		
Feature	INTERCEPTED CALL ROUTED TO	TONE	
Feature no	F0096		

SEE FEATURE NUMBER F0094

Package	NTX001AA21 COMMON BASIC		
Feature set	SERVICES		
Feature	MACHINE ANNOUNCEMENTS	ANALOG	
Feature no	F0097		

DESCRIPTION

THE ANNOUNCEMENT MACHINE PROVIDES UP TO 12 CHANNELS OF ANNOUNCEMENTS. THE RECORDED MESSAGE LENGTH IS 7 OR 14 SECONDS PER CHANNEL. ANNOUNCEMENTS APPEAR ON STANDARD TRUNK CIRCUITS CONNECTED TO THE SWITCH. EACH APPEARANCE MAY HAVE MULTIPLE CONNECTIONS TO IT (BROADCASTING). THE MAXIMUM NUMBER OF SIMULTANEOUS CONNECTIONS PERMITTED PER ANNOUNCEMENT TRUNK GROUP IS 512. BILINGUAL ANNOUNCEMENT IS AVAILABLE. IN THIS CASE 2 CHANNELS PER ANNOUNCEMENT GROUP (ONE FOR EACH LANGUAGE) ARE NORMALLY USED.

THE DMS SWITCH IS CAPABLE OF HANDLING UP TO 32 ANNOUNCEMENT GROUPS.

WITHIN EACH ANNOUNCEMENT GROUP, A MAXIMUM OF 8 CHANNELS CAN BE USED TO MAKE UP ONE COMPLETE MESSAGE.

Package	NTX001AA21 COMMON BASIC
Feature set	SERVICES
Feature	ORIGINATING AND TERMINATING SERVICE
Feature no	F0098

DESCRIPTION

THE SUBSCRIBER HAS THE ABILITY TO ORIGINATE AND TERMINATE CALLS.

Package	NTX001AA21 COMMON BASIC
Feature set	DIALING AND DIALING PLAN
Feature	DDD ACCESS (+1)
Feature no	F0099

DESCRIPTION

CODES ARE DIALLED BY SUBSCRIBERS TO ACCESS THE DDD NETWORK. STANDARD DIALING PROCEDURES ARE AS FOLLOWS:

STATION-TO-STATION

1 + 7 DIGITS

1 + 10 DIGITS

SEVEN DIGITS ARE USUALLY REQUIRED AFTER THE 1+ ACCESS CODE FOR DDD CALLS WITHIN THE HOME NUMBERING PLAN AREA (HNPA) AND 10 DIGITS FOR FOREIGN NUMBERING PLAN AREA (FNPA).

Package	NTX001AA21 COMMON BASIC
Feature set	DIALING AND DIALING PLAN
Feature	SERVICE CODE N11
Feature no	F0100

DESCRIPTION

SERVICE CODES IS A FEATURE THAT PROVIDES SIMPLIFIED DIALING IN ORDER TO COMPLETE CALLS TO FREQUENTLY CALLED SERVICE FACILITIES.

SERVICE CODES ARE OF THE FORM N11, WHERE N IS ANY DECIMAL DIGIT 2 THROUGH 9, WHEN THE SYSTEM RECEIVES A VALID SERVICE CODE AS THE FIRST THREE DIGITS DIALLED, DIALING IS CONSIDERED COMPLETE AND THE CALL IS ROUTED TO THE TRUNK GROUP ASSOCIATED WITH THE SERVICE REQUESTED, ALTHOUGH ALL SERVICE CODES ARE NOT UNIVERSALLY APPLIED I ALL CENTRAL OFFICES, THE NORMAL APPLICATION OF SERVICE CODES IS AS FOLLOWS:

A. LOCAL INFORMTION - 411 B. REPAIR - 611 C. BUSINESS OFFICE - 811 D. EMERGENCY - 911

CODES 211, 311, 511 AND 711 ARE RESERVED FOR POSSIBLE FUTURE SPE- CIAL SERVICES.

IF AN UNASSIGNED SERVICE CODE IS RECEIVED, THE CALL SHOULD BE GIVEN VACANT CODE TREATMENT.

Package	NTX001AA21 COMMON BASIC
Feature set	DIALING AND DIALING PLAN
Feature	LOCAL DIALING
Feature no	F0101

DESCRIPTION

EACH TELEPHONE MAIN STATION (IN A HNPA) IS ASSIGNED A UNIQUE 7-DIGIT NUMBER MADE UP OF A 3-DIGIT CENTRAL OFFICE CODE PLUS A 4-DIGIT STATION NUMBER (THOUSANDS GROUP). "X11" NUMBERS MAY BE TRANSLATED TO, AND ROUTED AS 7-DIGIT NUMBERS. LOCAL DIALING IS PERFORMED WITHIN A "LOCAL CALLING AREA", USUALLY WITHIN ONE NPA.

Package NTX001AA21 COMMON BASIC
Feature set DIALING AND DIALING PLAN
Feature NORTH AMERICAN CODE FORMAT
Feature no F0102

DESCRIPTION

THE ROUTING CODES FOR DISTANCE DIALLING WITHIN THE NORTH AMERICAN NUMBERING PLAN CONSIST OF TWO BASIC PARTS:

- 1) A 3-DIGIT AREA OR NUMBERING PLAN AREA (NPA) CODE
- 2) A 7-DIGIT TELEPHONE NUMBER MADE UP OF A 3-DIGIT CENTRAL OFFICE (CO) CODE PLUS A 4-DIGIT STATION NUMBER.

TOGETHER, THESE TEN DIGITS COMPRISE THE NETWORK "ADDRESS" OR "DESTINATION CODE" FOR EACH TELEPHONE. THIS ARRANGEMENT IS SHOWN BELOW AS IT WAS USED AT THE END OF 1973 PRIOR TO THE INTRODUCTION OF "INTERCHANGEABLE CODES".

AREA CODE TELEPHONE NUMBER N 0/1 X NNX-XXXX

WHERE X = ANY NUMBER FROM 0 THROUGH 9
 N = ANY NUMBER FROM 2 THROUGH 9
 0/1 = THE NUMBER 0 (ZERO) OR 1

WITH THE INTRODUCTION OF "INTERCHANGEABLE CODES", NXX CODES ARE AVAILABLE FOR CO AND NPA* CODES.

* EXCLUDING N11 CODES.
REFERENCE

AT&T NOTES ON DISTANCE DIALLING

Package NTX001AA21 COMMON BASIC
Feature set DIALING AND DIALING PLAN
Feature OPERATOR 0-
Feature no F0103

DESCRIPTION

OPERATOR ASSISTANCE N RESPONSE TO DIALLING A SINGLE DIGIT '0' IS A FEATURE THAT ROUTES A CALL DIRECTLY TO AN OPERATOR FOR ASSISTANCE. THE OPERATOR FACILITY MAY BE TSP, TSPS, OR A CORDBOARD, DEPENDING ON FEATURE ARRANGEMENTS OF THE CENTRAL OFFICE.

THE DMS DOES THE 4 SECONDS TIME-OUT TO DETERMINE WHETHER THE CALL IS A 0+ OR 0- TYPE, AND ROUTE THE CALL TO THE APPROPRIATE TRUNK.

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	RECEIVE/OUTPULSE UP TO 15 DIGITS
Feature no	F0104

DESCRIPTION

DMS HAS THE CAPABILITY TO RECEIVE AND/OR OUTPULSE UP TO 15 DIGITS.

THIS MEANS THAT DMS CAN HANDLE FIXED OR VARIABLE NUMBERING DIGITS FORMAT, LOCAL OR TOLL, NATIONAL OR INTERNATIONAL CALLS. THE 15 DIGITS INCLUDE THE PREFIXES.

Package	NTX001AA21 COMMON BASIC		
Feature set	INTERFACES		
Feature	INTERFACE TO	3CL SWITCHBOARD	
Feature no	F0108		

DESCRIPTION

DMS IS CAPABLE OF INTERFACING THE FOLLOWING SWITCHBOARDS:

- CAMA/3CL BOARDS
- S.C. TUNET FOR ONI AND VIAUAL INDICATORS
- NORTH ELECTRIC TSD FOR ONI
- S.C. SCAMA OPERATOR POSITIONS SWITCHBOARD
- A.E. #31 SWITCHBOARD

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	ALARMS	VISUAL ON FRAMES/AIS
Feature no	F0110	

DESCRIPTION

Alarm Control and Display Panel

The Alarm Control and Display panel (ACD), is functionally an integral part of the OAU. The ACD is physically separated from the OAU and located at the MAP for operational convenience. Mounted on the ACD are lamps which display the type and class of alarms detected by the alarm system, and switches which provide manual control of alarm system facilities. The ACD is linked to the alarm crosspoint field by connectorized cable for ease of installation.

Alarm Display Panel

The Alarm Display panel is a multiple of the ACD which has all the manual control switches removed except for the Audible Alarm Reset switch. Alarm Display panels (maximum 2) are provided on an optional basis as required by the telco (e.g., for cross-aisle visual alarms). The functions of the lamps and the single switch on the Alarm Display panel are the same as those on the ACD.

Exit Alarm Panel

An Exist Alarm panel is located near the main exit door of each DMS floor in a multifloored office. A maximum of three Exit Alarm panels (multiplied together) can be provided per DMS office. These panels direct maintenance personnel to the area, or the floor, of the office where an alarm condition has been detected. They also provide remote controls for the Night Alarm Transfer and Alarm Grouping circuits.

Package NTX001AA21 COMMON BASIC
Feature set INTERFACES
Feature MAGNETIC TAPE HANDLER 1600 BPI
Feature no F0112

DESCRIPTION

THE MAGNETIC TAPE CONTROLLER (MTC) CARD PROVIDES AN INTERFACE BETWEEN THE INPUT/OUTPUT CONTROLLER (IOC) AND ONE MAGNETIC TAPE DRIVE. THE MTC ACCEPTS AND RETURNS MESSAGES FROM AN TO THE IOC AND CONVERTS THE MESSAGES TO DATA TRANSFER AND CONTROL OPERATIONS FOR THE TAPE DRIVE.

THE DMS MACHINE ACCEPTS MAGNETIC TAPE HAVING THE FOLLOWING RECORDING CHARACTERISTICS:

- 1) TRACKS: 9-TRACK FORMAT
- 2) RECORDING DENSITY: 1600 CPI (BPI)
- 3) RECORDING TECHNIQUE: PHASE ENCODED
- 4) TAPE CHARACTER (BYTE): 8 BITS OF DATA PLUS 1 PARITY BIT (ODD PARITY)
- 5) BLOCK SIZE (PHYSICAL BLOCK): BETWEEN 18 AND 2048 TAPE CHARACTERS ARRANGED IN ACCORDANCE WITH THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) RECORDING FORMAT FOR MAGNETIC TAPE.

Package	NTX001AA21 COMMON BASIC
Feature set	INTERFACES
Feature	1200 BAUD DIAL-UP DATA PORT
Feature no	F0114

DESCRIPTION

1200 BAUD DIAL UP FACILITY IS USUALLY USED IN CONNECTION WITH ETAS (EMERGENCY TECHNICAL ASSISTANCE SERVICE). A DATA PHONE AND A 1200 BAUD EIA DIAL UP MODEM ARE REQUIRED TO INTERFACE WITH THE IOC. FOR RELIABILITY REASONS, THE DATA PHONE HAS A LINE APPEAR- ANCE NOT IN ITS OWN EXCHANGE BUT IN THE NEAREST LOCAL OFFICE.

THE DATA PHONE REACHES THE ETAS VIA THE DDD NETWORK.

Package	NTX001AA21 COMMON BASIC		
Feature set	MAINTENANCE AND TESTING		
Feature	ALARMS	AUDIBLE/VISUAL	
Feature no	F0115		

DESCRIPTION

The audible alarms are activated either on-site or are transferred by the Remote Alarm Transfer Circuit to a remote monitoring location. The on-site audible signalling devices are mounted on two different audible alarm panels: the main Audible Alarm Panel for DMS-100 Switch and optional TTC Audible Alarm Panel for the Trunk Test Center (TTC).

The main audible alarm panel provides the following signalling devices:

a) Critical Bell - a loud bell which signals:

- a Dead System alarm,
- a critical DMS System equipment failure,
- a critical DMS Power Plant failure,
- a critical system or power plant failure in another system (if alarm grouping is in effect).

b) Major Chime - a loud tone bar, struck at 60 ipm which signals:

- a major DMS System failure,
- a major DMS Power Plant failure,
- a Frame Supervisory Panel alarm on any equipment aisle,
- a major equipment failure in another system (if alarm grouping is in effect).

c) Alarm Battery Subset - a loud telephone ringer (two bells with resonators) which signals the following major alarms:

- an alarm battery supply failure at a PDC,
- a battery failure at the OAU or the associated MTM,
- failure of an internal supply circuit at the OAU or MTM (+/-130V supply, or 20 Hz AC ringing supply),
- a loss of communication between the Central Control and the OAU or MTM.

d) Minor Alarm Subset - a loud telephone ringer (two bells without resonators) which signals:

- a minor DMS System equipment failure,
- a minor DMS Power Plant failure,

- a minor equipment failure in another system (if alarm grouping is in effect),
- an incoming call on a 101 Communication Test Line at the TTC (if night alarm transfer is in effect).

The TTC audible alarm panel provides a TTC Chime which signals an incoming call on a 101 Communication Test Line

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	ALARMS	DEAD OFFICE ALARM
Feature no	F0116	

DESCRIPTION

Remoting

The Remote Alarm Transfer circuit facilitates the transfer of major and minor alarm indications, for the DMS office and power plant, to a remote alarm receiving circuit in a distant office. This permits the local office to be unattended. Since the remote alarm receiving circuit monitors only two classes of alarms, major and minor, the DMS critical alarms are transferred to the remote location as majors. If alarm grouping is in effect, alarms originating on preceding and succeeding floors are also transferred to the remote location.

The alarms are transferred to the distant office by the momentary operation of the non-locking Alarm Transfer switch at the ACD, or by the operation of the non-locking Alarm Reset key at the remote alarm receiving circuit in the distant office. When the alarms are transferred the Alarm Transfer lamp, above the Alarm Transfer switch at the ACD, lights. Remote alarm transfer is cancelled by re-operating the Alarm Transfer switch at the ACD, or the Alarm Reset key at the remote alarm receiving circuit in the distant office. To reset alarm indications at the distant office, the remote alarm transfer is cancelled and re-initiated by operating the Alarm Reset key twice.

Dead System Alarm

The Dead System alarm is generated by the alarm system hardware to indicate a loss of call processing ability in the DMS office. When a dead system condition occurs the dead system alarm hardware alerts telco personnel by sounding the critical alarm bell and lighting the Critical System lamp on the ACD.

The Dead System alarm is generated when the alarm circuits of both the OAU and the MTM detect a loss of communication with the CC. This alarm condition may be caused by multiple faults in the hardware of the DMS-100 Series Message System (NTP 297-1001-104), or by a loss of sanity in the CC software. In either case, call processing is affected and, due to the loss of communication, an alarm cannot be generated in the normal manner

through the alarm system software in the CC. If there are multiple faults in the message system the appropriate maintenance subsystem can detect the faults and alert maintenance personnel visually at the MAP VDU, but the corresponding audible and visual alarm hardware cannot be activated.

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	ALARMS	MAJOR MINOR CRITICAL
Feature no	F0117	

DESCRIPTION

Visual Alarms on Frames/Aisles

Each equipment aisle in the DMS office is equipped with End Aisle Pilot lamps (red) which light if a fault is detected by any Frame Supervisory Panel (FSP) in the aisle. Also each FSP in the aisle is equipped with a Frame Fail lamp which lights to indicate which frame in the aisle generated the alarm. The FSP for frames having cooling units are also equipped with a Fan Fail lamp.

Alarm Classes

Detected trouble conditions are classified in three levels of severity according to the urgency to respond to the trouble condition, or to return the affected equipment to normal operation. Trouble conditions are assigned to an alarm class by the maintenance subsystem which detects the trouble. The alarm classes, in decreasing order of severity, are Critical, Major, and Minor.

External Alarm Indication

External alarms are interfaced to the DMS system by scanpoints, which are assignable by telco personnel. These alarms are generated outside the switching office although they may be initiated by related devices such as Carrier Group alarms.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	AUTO BUSY OUT OF FAULTY SUB-UNIT
Feature no	F0118

DESCRIPTION

WHEN THE DMS, IN ITS NORMAL OPERATION, OR DURING PERIODIC TESTING, DISCOVERS A FAULT IN A SUB-UNIT, IT WILL AUTOMATICALLY BUSY IT OUT. THIS BUSY OUT IS CALLED SYSTEM MADE BUSY AND THERE IS A USAGE COUNT IN OM FOR THIS SYSTEM MADE BUSY CONNECTION.

Package NTX001AA21 COMMON BASIC
 Feature set MAINTENANCE AND TESTING
 Feature BUSY OUT/IDLE EQUIPMENT
 Feature no F0119

DESCRIPTION

THE CRAFTSPERSON HAS THE ABILITY TO BUSY OUT OR IDLE SPECIFIED TRUNKS BY ENTERING THE PROPER COMMANDS AT THE TTP LEVEL OR LTP LEVEL OF THE MENU DISPLAY.

REMOVING TRUNKS FROM SERVICE (BUSY) -----

THE MANUAL BUSY COMMAND APPLIES TO THE TRUNK UNDER THE TTP CONTROL POSITION THEREBY SETTING THE RETURN STATE OF THIS TRUNK TO MANUAL BUSY (MB), OR TO THE STATE INDICATED OR SETS THE TRUNK TO THE STATE INDICATED, IF IT IS NOT SEIZED. THIS COMMAND MAY ALSO BE APPLIED TO ALL THE POSTED TRUNKS. THE AVAILABLE TRUNKS ARE SET MB IMMEDIATELY AND THE SERVICE BUSY TRUNKS ARE REFERRED TO THE BUSY PROCESS OR TO THE STATE INDICATED. THE BUSY PROCESS SETS THE SERVICE BUSY TRUNKS TO THE MANUAL BUSY STATE WHEN THEY BECOME AVAILABLE.

RETURNING TRUNKS TO SERVICE (RTS)

THE RETURN TO SERVICE COMMAND APPLIES TO THE TRUNK UNDER THE TTP CONTROL POSITION TO SET ITS RETURN STATE TO IDLE IF SEIZED, OR IDLING IT IF IT IS NOT SEIZED WHEN IT IS RELEASED FROM THE TTP. THIS COMMAND CAN ALSO BE APPLIED TO ALL THE POSTED TRUNKS. HOWEVER, ONLY THE POSTED TRUNKS THAT ARE IN THE MANUAL BUSY STATE CAN BE RETURNED TO THE IDLE STATE. TO RETURN-TO-SERVICE TRUNKS THAT ARE IN A DIFFERENT STATE, OTHER THAN MANUAL BUSY, REQUIRES THEY BE MANUAL BUSY FIRST.

REFERENCE

NTP 297-1001-116 NTP 297-1001-501

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	INTEGRATED CO COMMUNICATIONS
Feature no	F0121

DESCRIPTION

THE MAINTENANCE AND ADMINISTRATION POSITION (MAP) FEATURES A CENTRAL OFFICE COMMUNICATION SYSTEM (COCS) CONSISTING OF A TELEPHONE MODULE (I.E., LOGIC SET) WHEREBY ALL THE COMMUNICATIONS TRUNK, 101 TEST LINES, LOCAL TALK LINES, HEADSET TALK/MONITOR LINES AND CENTRAL OFFICE (CO) LINES ARE TERMINATED.

REFERENCE

NTP 297-1001-110

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DMO SYSTEM(ADD,DEL,MOD) DIRECTORY NUMBERS (D
Feature no	F0123

DESCRIPTION

The DMS-100 Family of Digital Switching Systems provides a single data modification facility for both customer and office related data. Modification requests by maintenance and administrative personnel are specified in Data Modification Order (DMO's) and are implemented using the Table Editor (refer to NTP 297-1001-300).

Customer data such as directory numbers, line equipment numbers, features and services are contained in various data tables. Using Table Editor commands, the operating company has the ability to add, delete, or change any triples or fields within a specific table.

Office data such as trunk types, group numbers and translation information are contained in various data tables. Again, these tables may be modified by the operating company using various Table Editor commands.

REFERENCES

NTP 297-1001-451
NTP 297-2101-451
NTP 297-2201-451
NTP 297-2301-451

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	LINE/TRUNK STATUS QUERY OR DUMP
Feature no	F0126

DESCRIPTION

MAINTENANCE PERSONNEL HAVE THE ABILITY TO QUERY THE STATUS OF LINES/TRUNKS TO VARIOUS DEGREES, DEPENDING ON WHICH LEVEL IS ACCESSED AT THE LTP/TTP.

THE QUERY FOR TRUNK STATUS IS AVAILABLE AT THE MAINTENANCE LEVEL OF THE MENU (MTCE), AND SUBSEQUENT LOWER LEVELS. STKATUS CODES INDICATE THE NUMBER OF TRUNK GROUPS WITH SPECIFIC ALARM TYPES OR BUSY TYPES. TELESCOPING THROUGH THE TRUNKS LEVEL (TRKS) TO THE TRUNK GROUP STATUS DISPLAY LEVEL (STATTKGRP) ALLOWS THE CRAFT-SPERSON TO DISPLAY ALL TRUNK GROUPS OF A SPECIFIC TYPE (INCOMING, OUTGOING, ETC.) AND SPECIFIC ALARM STATUS (OPTIONAL). TELESCOPING TO THE TRUNKS STATUS LEVEL (STATTRKS) ALLOWS THE DISPLAY OF TRUNKS WITHIN A GROUP WHICH HAVE A SPECIFIED STATE.

IT IS POSSIBLE TO PRINT A HARD COPY OF THE TRUNK STATUS DISPLAY FROM ANY OF THE MENTIONED MENU LEVELS.

Package	NTX001AA21 COMMON BASIC		
Feature set	MAINTENANCE AND TESTING		
Feature	MAINTENANCE POSITION	DIAL-UP ACCESS	
Feature no	F0128		

DESCRIPTION

THE MAP (MAINTENANCE AND ADMINISTRATION POSITION) CAN BE:

1) LOCAL 2) REMOTE 3) REMOTE DIAL-UP

THE CURRENT LOO9P INTERFACE IS USED FOR THE LOCAL CONFIGURATION.

EIA MODEM IS USED FOR THE REMOTE CONFIGURATION AND AN EIA DIAL UP MODEM WITH DATA PHONE FOR THE REMOTE DIAL-UP CONFIGURATION.

Package NTX001AA21 COMMON BASIC
Feature set MAINTENANCE AND TESTING
Feature MAINTENANCE POSITION LOCAL
Feature no F0129

SEE FEATURE NUMBER F0128

Package NTX001AA21 COMMON BASIC
Feature set MAINTENANCE AND TESTING
Feature MAINTENANCE POSITION REMOTE
Feature no F0130

SEE FEATURE NUMBER F0128

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	MANUAL CONTROL OF SYSTEM CONFIGURATION
Feature no	F0131

DESCRIPTION

SYSTEM CONFIGURATION MAY BE CONTROLLED FROM THE MAINTENANCE POSITION IN ORDER THAT NORMAL MAINTENANCE AND EXTENSION ACTIVITY CAN TAKE PLACE. A CONTROL AND DISPLAY CAPABILITY IS ALSO AVAILABLE ON THE CENTRAL CONTROL COMPLEX FRAME. HOWEVER THIS IS USED ONLY IN AN EMERGENCY SITUATION.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	MANUAL LINE OR TRUNK ACCESS TESTING
Feature no	F0132

DESCRIPTION

FROM A MAINTENANCE AND ADMINISTRATIVE POSITION, AFTER TELESCOPING TO THE TRUNK TEST POSITION (TTP) SUBSYSTEM LEVEL FROM TRUNKS SYSTEM LEVEL, A TRUNK CAN BE ACCESSED OR SEIZED IN THE FOLLOWING WAYS:

- EITHER BY CLLI FOLLOWED BY CIRCUIT NUMBER - OR BY TM NAME, TM NUMBER AND TM POSITION NUMBER (0-29) - OR BY DC NAME, DC NUMBER, T1 NUMBER AND TS NUMBER (TIME SLOT)

AFTER THE TRUNK HAS BEEN POSTED AND SEIZED, MANUAL TESTING MAY THEN START. IN A SIMILAR WAY, A LINE CAN BE POSTED AND SEIZED AFTER TELESCOPING TO THE LINE TEST ACCESS (LTA) SUBSYSTEM LEVEL FROM LINES SYSTEM LEVEL.

THE MANUAL TESTS WHICH CAN BE INITIATED ARE TEST LINE TESTS OR DIAGNOSTIC TESTS.

Package NTX001AA21 COMMON BASIC
Feature set MAINTENANCE AND TESTING
Feature ROUTINE TESTING
Feature no F0135

DESCRIPTION

DMS-100 ROUTINE AUDIT SOFTWARE IS USED TO MAKE PERIODIC CHECKS ON THE DATA STRUCTURES OF THE VARIOUS SUB-SYSTEMS FOR INTEGRITY, REASONABLENESS AND, WHERE APPROPRIATE, TO SE THAT THEY MATCH THE ACTUAL HARDWARE STATES THAT THEY ARE MEANT TO REPRESENT. USUALLY ANY DISCREPANCY IS LOGGED AND, WHRE POSSIBLE, CORRECTED. WHERE THEY ARE VERY SERIOUS, UNRECOVERABLE DISCREPANCIES THE OFFICE ALARM MAY BE SOUNDED AND IN EXTREME SITUATIONS, MAINTENANCE MAY CAUSE A SYSTEM RESTART OR EVEN A RELOAD OF THE SYSTEM FROM TAPE.

THERE ARE FOUR LEVELS OF DMS AUDITS:

- AUDITS OF TELEPHONY EQUIPMENT SUCH AS LINES, TRUNKS, AND TONE RECEIVERS
- AUDITS OF CALL PROCESSING SOFTWARE RESOURCES - THESE ARE DATA STRUCTURES THAT CHART THE PROGRESS OF INDIVIDUAL CALLS
- AUDITS OF OPERATING SYSTEM SOFTWARE RESOURCES SUCH AS MAIL BOXES, LETTERS AND MEMORY
- AUDITS OF CALL COMPLETION

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	SEMI-AUTOMATIC TRUNK TESTING
Feature no	F0136

DESCRIPTION

THE AUTOMATIC TEST COMMANDS THAT ARE PROVIDED APPEAR ON THE TTP LEVEL DISPLAY. THESE ARE THE DIAGN (DIAGNOSTIC) AND TLTEST (TEST LINE TEST) COMMANDS.

THESE TWO AUTOMATIC TESTS CAN BE REQUESTED ON ANY TRUNK. ONCE THE COMMAND IS ENTERED, THE TTP INITIATES TEST AND DISPLAYS THE RESULTS ON THE VDU. THE TEST EQUIPMENT REQUIRED IS SELECTED BY ITS CORRESPONDING TEST SEQUENCE. THE TEST PERFORMED HAS A PREDE-TERMINED TEST SEQUENCE. ONCE THE TEST IS COMPLETED, THE TEST EQUIPMENT IS IDLED AND THE CIRCUIT UNDER TEST IS RETURNED TO THE TTP CONTROL.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	SYSTEM STATUS DISPLAY
Feature no	F0138

DESCRIPTION

THE FIRST 3 LINES IN THE MAP CRT SCREEN, WHEN THE MAP IS IN THE MAINTENANCE MODE, DISPLAY THE OVERALL SYSTEM STATUS AT ANY GIVEN MOMENT. THE FIRST LINE DISPLAYS THE HEADINGS OF THE MAINTENANCE SUBSYSTEMS. THE SECOND LINE DISPLAYS THE STATUS CODES BENEATH THE SUBSYSTEM HEADER TO SHOW THE MOST SERIOUS OUT OF SERVICE CONDITION EXISTING IN THE SUBSYSTEM. THE THIRD LINE DISPLAYS THE ALARM CLASS OF THE OUT OF SERVICE CONDITION. (CRITICAL, MAJOR, MINOR, ETC.)

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	ALARMS	REMOTING
Feature no	F0139	

DESCRIPTION

The Dead System alarm is generated by the alarm system hardware to indicate a loss of call processing ability in the DMS office. When a dead system condition occurs the dead system alarm hardware alerts Telco personnel by sounding the critical alarm bell and lighting the Critical System lamp on the ACD.

The Dead System alarm is generated when the alarm circuits of both the OAU and the MTM detect a loss of communication with the CC. This alarm condition may be caused by multiple faults in the hardware of DMS-100 Family Message System (297-1001-104), or by a loss of sanity in the CC software. In either case, call processing is affected and, due to the loss of communication, an alarm cannot be generated in the normal manner through the alarm system software in the CC. If there are multiple faults in the message system the appropriate maintenance subsystem can detect the faults and alert maintenance personnel visually at the MAP VDU, but the corresponding audible and visual alarm hardware cannot be activated.

The two SP points, one in the OAU and one in the MTM, used to generate the OAU alarm are also used to generate the Dead System alarm. In addition to controlling the alarm relay, each SD point also controls a normally operated Dead System relay which, in Version 1 Office Alarm Systems, is also contained in the Office Alarm Circuit 3 card.

A connection to ground is wired through break contacts of the Dead System relay in both the OAU and the MTM to the Critical Bell on the audible alarm panel, and to the Critical System lamp on the ACD. Battery (-48V) is connected to the Critical Bell from the OAU shelf, and to the Critical System lamp from the MTM shelf. When both the OAU and the MTM detect a loss of communication with the CC, both alarm SD points are released. This action releases both dead system relays, closing their break contacts, and generating the audible and visual critical system alarm.

Version 2 Dead System and OAU Alarms

The implementation of the OAU alarm and Dead System alarm in the Version 2 system varies from that described above, in that the scan and signal distribution points responsible for the generation of the alarms are incorporated into the OAU Dead System Circuit cards in the OAU and MTM, rather

than using separate scan and signal distribution cards. The OAU Dead System Circuit cards contain all necessary control relays.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	AUTOMATIC TROUBLE DIAGNOSTIC AND STANDBY SWITCHING
Feature no	F0140

DESCRIPTION

MAJOR SUBSYSTEMS OR MODULES ARE DIAGNOSED PERIODICALLY. WHEN A DIAGNOSTIC TEST OCATES A FAULT, THE AFFECTED EQUIPMENT UNIT IS PEGGED AND AUTOMATICALLY PLACED IN THE SYSTEM MADE BUSY STATE TO REMOVE IT FROM SERVICE. IF THIS EQUIPMENT UNIT HAS A BACK-UP (OR SPARE) THE BACK UP UNIT WILL BE SWITCHED INTO SERVICE AUTOMAT- ICALLY.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	T1 SYSTEM MTCE WHEN DIRECTLY CONNECTED
Feature no	F0144

DESCRIPTION

THE MAINTENANCE OF THE T1 SYSTEM IS USUALLY DONE EXTERNALLY AND IS NOT A FEATURE OF A SWITCHING MACHINE. THE T1 FAULTS ARE DETECTED AND DIAGNOSED IN THE CHANNEL BANK FRAME WHERE ALARM PANELS AND MAINTENANCE CONTROL KEYS ARE SITUATED.

WITH DMS, THE T1 WILL BE CONNECTED DIRECTLY TO THE SWITCH VIA THE DCM. THIS MAKES IT POSSIBLE FOR THE DMS TO MONITOR THE STATES AND THE CONDITIONS OF T1 SPANS.

THE DCM MAINTENANCE SUB-SYSTEM PROVIDES THE FOLLOWING MAINTENANCE FACILITIES:

- TIME FRAMING TEST INDICATION (CARRLOF) ON THE INCOMING SIDE OF THE ASSOCIATED DIGITAL CARRIER
- INCOMING BIT STREAM SLIP INDICATION (CARRSLP)
- PEG COUNT ON RECEPTION OF A MESSAGE INDICATING THAT BIPOLAR VIOLATION HAS EXCEEDED THE MAINTENANCE OF OUT-OF-SERVICE LIMITS (CARRBPVL)
- CARRIER FAIL INDICATION (CFL)
- SYSTEM MAKE BUSY (SBU) AND MANUAL MAKE BUSY (MBU)

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	ALARMS	EXTERNAL ALARM DETEC
Feature no	F0148	

DESCRIPTION

EXTERNAL ALARM INDICATION -----

EXTERNAL ALARMS ARE INTERFACED TO THE DMS SYSTEM BY SCANPOINTS, WHICH ARE ASSIGNABLE BY TELCO PERSONNEL. THESE ALARMS ARE GENERATED OUTSIDE THE SWITCHING OFFICE ALTHOUGH THEY MAY BE INITIATED BY RELATED DEVICES SUCH AS CARRIER GROUP ALARMS.

Package	NTX001AA21 COMMON BASIC		
Feature set	SIGNALING AND SUPERVISION		
Feature	TRUNKS -	BATTERY AND GROUND	
Feature no	F0149		

SEE FEATURE NUMBER F1100

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - LOOP
Feature no F0152

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	DELETE/PREFIX UP TO 15/11 DIGITS RESPECTIVELY
Feature no	F0154

DESCRIPTION

DMS HAS THE ABILITY TO DELETE FROM 0 TO 15 DIGITS AND PREFIX FROM 0 11 DIGITS.

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	FOREIGN AREA TRANSLATION
Feature no	F0155

DESCRIPTION

FOREIGN AREA TRANSLATION IS A FEATURE THAT PROVIDES SELECTIVE ROUTING FOR 10-DIGIT CALLS BASED UPON THE REQUESTED FNPA CODE AND OFFICE CODE. THIS TRANSLATION IS ONLY REQUIRED FOR FNPA'S WHICH CAN BE ACCESSED BY MORE THAN ONE ROUTE.

THE SYSTEM IS CAPABLE OF SELECTING A PREFERRED ROUTE TO THE FNPA BY EXAMINING (TRANSLATING) THE FIRST SIX DIGITS (AREA CODE PLUS OFFICE CODE) OF A 10-DIGIT CALL.

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	INTERCHANGEABLE AREA/OFFICE CODES-E DIGIT UNBLOCKI
Feature no	F0156

DESCRIPTION

THIS FEATURE PERMITS NUMBERING PLAN AREA (NPA) CODES N0/1X AND CENTRAL OFFICE CODES NNX TO BE USED FOR EITHER CENTRAL OFFICE OR NPA CODES. THIS IS DONE BY UNBLOCKING THE "E" DIGIT.

Package NTX001AA21 COMMON BASIC
Feature set DIALING AND DIALING PLAN
Feature OPERATOR/TOLL CALLS (1N1/11XX)
Feature no F0157

DESCRIPTION

THIS FEATURE ENABLES DMS TO TRANSLATE AND ROUTE THE FOLLOWING SYSTEM CODES:

- TERMINATING TOLL CENTRE CODES (TTC) - 0/1XX SERIES
- OPERATOR CODES:
 - OPC3 - 0/1XX SERIES
 - OPC4 - 11XX SERIES
 - OPC5 - 11XXX SERIES

THESE CODES ARE NOT DIALED BY THE SUBSCRIBERS. THEIR PRINCIPLE USE IS TO ENABLE THE OPERATORS TO ACCESS VARIOUS OPERATORS, SERVICE AND INFORMATION DESKS.

SOME EXAMPLES OF THESE CALLS ARE:

121 INWARDS
131 TOLL INFORMATION
181 TOLL STATION
1155 PERSON CALL BACK TIME AND CHARGE
1156 PERSON CALL BACK HOTEL

Package NTX001AA21 COMMON BASIC
Feature set MAINTENANCE AND TESTING
Feature LINE/TRUNK TYPE QUERY
Feature no F0159

DESCRIPTION

TRUNK CIRCUIT TYPE INFORMATION IS DISPLAYED WHEN THE TRUNK TEST POSITION (TTP) LEVEL MENU IS ACCESED. THE CIRCUIT TYPE DISPLAY IS COMPOSED OF THREE SUB-FIELDS INDICATING:

1) TRUNK GROUP TYPE - INCOMING, OUTGOING, ETC. 2) DIRECTION - INTER-TOLL, TOLL COMPLETING, ETC. 3) PULSING TYPE - DP, MF, SF, CCIS, ETC.

IN A SIMILAR WAY, LINE TYPE INFORMATION IS DISPLAYED WHEN THE LINE TEST POSITION (LTP) LEVEL IS ACCESSED. THE LINE INFORMATION INCLUDES CIRCUIT-TYPE, LINE CLASS CODE, TIP OR RING PARTY, RINGIN CODE, CORD TYPE (A, B OR C) ETC.

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	TRANSLATION IMPLIED BY DIALLING PLAN AND SIGNALING
Feature no	F0162

DESCRIPTION

FULL TRANSLATION CAPABILITY FOR NORTH AMERICAN LOCAL AND DDD NETWORK IS PROVIDED.

1) DIGIT TRANSLATION AND ROUTING ON 3 TO 6 DIGITS 2) HOME AND FOREIGN AREA TRANSLATIONS 3 AND 6 DIGITS 3) INTERCHANGEABLE OFFICE AND AREA CODE TRANSLATION 4) SERVICE CODE TRANSLATION (N11 OR 11X) 5) THOUSANDS-DIGIT ROUTING

Package NTX001AA21 COMMON BASIC
Feature set SWITCHING AND TRANSLATION
Feature UP TO 7 ALTERNATE ROUTES
Feature no F0163

DESCRIPTION

WHEN ALL CALLS IN A SELECTED TRUNK GROUP ARE BUSY, THE DMS SWITCH HAS THE CAPABILITY OF ROUTING THE CAL UP TO A MAXIMUM OF 7 ALTER- NATE ROUTES AS SPECIFIED BY THE CUSTOMER. IF NO ALTERNATE ROUTE IS ACCESSIBLE, OVERFLOW TONE WILL BE RETURNED TO THE CALLING SUB- SCRIBER.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC OPERATIONAL MEASUREMENT-RCVR ATT-MENT DELAY
Feature no	F0313

DESCRIPTION

THE RECEIVER ATTACHMENT DELAY RECORDER IS A PROCESS BY WHICH TEST CALL ORIGINATIONS ARE GENERATED FOR THE PURPOSE OF TIMING THE INTERVAL PERIOD FROM THE TIME OF THE ORIGINAL REQUEST FOR ATTACHMENT TO AN MF (MULTI-FREQUENCY) RECEIVER TO THE ACTUAL TIME OF CONNECTION. THIS TEST PROGRAM PROVIDES NETWORK MANAGEMENT WITH A MEASURE OF MACHINE CONGESTION. RADR MEASUREMENTS FROM PART OF THE DMS 100 FAMILY OPERATIONAL MEASUREMENTS (OM) SYSTEMS. WITH THE NWM, FEATURE, THE PERCENTAGE OF CALLS ENCOUNTERING RECEIVER ATTACHMENT DELAY IS UPDATED EVERY MINUTE AND DISPLAYED ON THE NWM VDU. THE FEATURES ASSOCIATED WITH RADR ARE:

- (A) THE NUMBER OF TEST CALLS PER HOUR IS DATA MODIFIABLE
- (B) A LOWER DELAY THRESHOLD IS DATA MODIFIABLE
- (C) AN UPPER DELAY THRESHOLD IS DATA MODIFIABLE
- (D) THE NUMBER OF TEST CALLS ACTUALLY PROCESSED IS PEGGED
- (E) THE NUMBER OF TEST CALLS DELAYED MORE THAN THE LOWER THRESHOLD IS PEGGED
- (F) THE NUMBER OF TEST CALLS DELAYED MORE THAN THE UPPER THRESHOLD IS PEGGED
- (G) THE PERCENTAGE OF THE TEST CALLS DELAYED MORE THAN THE LOWER DELAY THRESHOLD IS RECORDED
- (H) THE RADR TEST PROGRAM MAY BE DISABLED AT ANY TIME BY SETTING THE CALL RATE TO ZERO.

REFERENCE

NTP 297-1001-452

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TRAFFIC ANALYSIS
Feature no	F0315

DESCRIPTION

This feature provides up to 256 peg count registers which can be assigned to measure traffic, on a trunk group basis, from any incoming trunk group to any outgoing trunk group.

Up to 32 preroute peg count registers may be stored in DMS-200. They are provisioned on a per office basis and not per trunk group.

These may be assigned by:

- a) NXX
- b) NPA
- c) NPA-NXX

Package	NTX001AA21 COMMON BASIC
Feature set	DIALING AND DIALING PLAN
Feature	TOLL CALLS WITHOUT PREFIX DIGIT 1
Feature no	F0602

DESCRIPTION

This feature allows subscribers to place any station-to-station toll call without first dialing a prefix "1". Only 7 or 10 digits are dialed.

Package	NTX001AA21 COMMON BASIC		
Feature set	TRUNK TYPES		
Feature	ANALOG	4-WIRE INTERTOLL	
Feature no	F0805		

DESCRIPTION

DMS PROVIDES FOR 2-WIRE OR 4-WIRE ANALOG TRUNKS.

TRUNKS CAN BE IC, OG OR 2-WAY.

LEVEL ADJUSTMENT PADS ARE PROVIDED WITHIN THE TRUNK CIRCUIT (MAN- UALLY ADJUSTABLE).

4W TRUNKS HAVE 600 OHM IMPEDANCE

2W TRUNKS MAY BE 600 OHM OR 900 OHM IMPEDANCE (ACCORDING TO TRUNK TYPE). A 2-WIRE TO 4-WIRE TERMINATING SET IS INCORPORATED WITHIN THE TRUNK. BALANCING OF THE TERMINATING SET IS PROVIDED AS A PLUG IN OPTION.

REFERENCE

NTP 297-1001-152 - TRUNK SELECTION AND COMPATIBILITY

Package	NTX001AA21 COMMON BASIC		
Feature set	TRUNK TYPES		
Feature	ANALOG	2-WIRE INTEROFFICE	
Feature no	F0806		

SEE FEATURE NUMBER F0805

Package	NTX001AA21 COMMON BASIC
Feature set	DIALING AND DIALING PLAN
Feature	INFORMATION
Feature no	F0807

DESCRIPTION

THESE ARE CODES DIALLED BY THE SUBSCRIBER TO REACH DIRECTORY ASSISTANCE. IDENTIFIED CODES ARE AS FOLLOWS:

LOCAL - 411 (OR EQUIVALENT)

HNPA - 555-1212 OR 1+555-1212 OR 1+411

FNPA - 1+NPA+555-1212 OR 1+NPA+411

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	SUBSTITUTE DIGITS (UP TO 11)
Feature no	F0808

DESCRIPTION

IN DMS TRANSLATION, SUBSTITUTION IS EQUIVALENT TO DELETING FOLLOWED BY PREFIXING. BUT THEN THE LIMITATION IS ON THE PREFIXING CAPABILITY OF DMS (UP TO 11 DIGITS).

HOWEVER, SUBSTITUTION CAN BE READILY ACHIEVED IN STANDARD PRE-TRANSLATION WHERE A REPLACEMENT CODE CAN BE DIRECTLY SPECIFIED. IT IS POSSIBLE TO REPLACE ANY NUMBER OF DIGITS BY 3 TO 11 DIGIT CODES.

EXAMPLE: CALLS TO REPAIR SERVICE DESK (611) ARE TO TERMINATE ON LINE WITH DIRECTORY NUMBER 725-2350.

PRE-TRANSLATION WILL ROUTE TO NATIONAL TRANSLATION (HOME NPA CODE TABLE) WITH REPLACEMENT CODE 725-2350 FOR DIGIT ANALYSIS.

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	PROVISION OF 2048 TRUNK GROUPS (1-WAY & 2-WAY)
Feature no	F0809

DESCRIPTION

THE MAXIMUM NUMBER OF TRUNK GROUPS THAT DMS CAN ACCOMMODATE IS 2048.
THIS INCLUDES 1-WAY (INCOMING OR OUTGOING) PLUS 2-WAY TRUNKS.

Package	NTX001AA21 COMMON BASIC		
Feature set	INTERFACES		
Feature	INTERFACE TO	DMS-10 ,DMS-100 ,DMS-2	
Feature no	F0810		

DESCRIPTION

DMS-100 FAMILY SWITCHERS CAN INTERFACE DIRECTLY TO DMS-10, AND WITH EACH OTHER VIA T1 SPANDS AND DCM TERMINAL INTERFACES IN STANDARD NORTH AMERICAN 24 CHANNEL 1.544 MBIT/S BIT-STREAM U-LAW SIGNALLING FORMAT (DE-3 FORMAT).

Package	NTX001AA21 COMMON BASIC		
Feature set	INTERFACES		
Feature	INTERFACE TO	T1,DE2/DE3/D1D	
Feature no	F0811		

DESCRIPTION

DMS INTERFACES DIRECTLY WITH A DS1 RATE SPAN LINE (E.G. T1) VIA A DIGITAL CARRIER MODULE (DCM) AND OBVIATES THE USE OF CHANNEL BANKS. FAR END CHANNEL BANKS MUST BE D2, D3 OR DID COMPATIBLE.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	INTERACTIVE CRT FOR MTCE I/O HAZELTINE MODULAR ON
Feature no	F0823

DESCRIPTION

THE MAINTENANCE I/O IS THE PRIMARY HUMAN INTERFACE TO THE DMS SWITCH. THE CRT TERMINAL CONNECTED TO THIS MAINTENANCE I/O PROVIDES ALL VISUALLY DISPLAYED INFORMATION FROM ALARM INDICATIONS TO TEST RESULTS. MANUAL INPUT TO THE SYSTEM ARE NEARLY ALL MADE THROUGH THE TERMINAL KEYBOARD. THE SOFTWARE GENERATED DISPLAY FOR MAINTENANCE AND TESTING IS BASED ON A "TELESCOPING" CONCEPT DEFINED AS THE FOLLOWING OF A BRANCHING SCHEME TO DETERMINE THE SMALLEST REPLACEABLE UNIT WHICH CAN BE CHANGED TO RESTORE SYSTEM STATUS TO NORMAL. IT IS ACHIEVED BY DISPLAYING VARIOUS LEVELS OF STATUS INFORMATION IN THE SYSTEM STATUS AND WORK AREAS OF THE CRT. THE STATUS DATA AT EACH LEVEL IS CONSTANTLY UPDATED IN REAL TIME. ASSOCIATED WITH EACH LEVEL IS A MENU OF POSSIBLE FUNCTIONS OR COMMANDS WHICH THE CRAFTSMAN CAN PERFORM AT THAT LEVEL OF INTERROGATION.

DMS WILL SUPPORT THE FOLLOWING VDU TERMINALS:

- HAZELTINE MODULAR ONE - VT-100 - CYBERNEX MDL-110

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	INTERACTIVE CRT FOR MTCE I/O VT100
Feature no	F0824

SEE FEATURE NUMBER F0823

Package NTX001AA21 COMMON BASIC
Feature set MAINTENANCE AND TESTING
Feature INTERACTIVE CRT FOR MTCE I/O CYBERNEX MDL-110
Feature no F0825

SEE FEATURE NUMBER F0823

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DATA MODIFICATION SYSTEMTRUNK DATA BASE QUER
Feature no	F0835

DESCRIPTION

The line data base queries in DMS are used to query the status (working or unassigned) of a directory number or line equipment, and to identify the service features, options and parameters associated with a working line which may be a flat rate, multi-party, PBX line or line with special services.

The trunk data base queries in DMS are used to determine the status (working or unassigned) of a trunk in a trunk group or in TM or DCM and to identify the characteristics associated with a trunk or a trunk group such as TMTYPE, TMNO (or DCMNO), IMCKTNO (DCMCKTNO), CARDCODE (DCMCKTTS), External trunk state which can be unequipped, working, or hardware assigned software unassigned.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DATA MODIFICATION SYSTEM EMERGENCY ACTIVATION
Feature no	F0836

DESCRIPTION

Emergency Activation

The normal mode of operation for the Data Modification System is with the two CPU in synchronization with each other (in-sync). Normally DMO entered while the CPU are out-of-sync will be rejected. However, in the rare event that the CPU are out-of-sync for longer than a few minutes, and urgent data changes must be made, an emergency activation mode is provided (for line/DN orders only). This mode permits DMO to be loaded into the active CPU.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BASIC DATA MODIFICATION SYSTEMDEFAULT FOR CONSEC S
Feature no	F0837

DESCRIPTION

If a particular DMO involves entering the same data for a large number of elements, it is possible to define a set of default values applicable to all elements. This is accomplished through the use of "Default" command in the Table Editor repertoire.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DISPLAY/PRINTER TERMINALS
Feature no	F0838

DESCRIPTION

A full range of VDU displays and printer terminals can be provided for administration purposes. Each terminal can be dedicated to a specific administrative function.

e.g. a terminal for service orders, another terminal for OM

Combination of functions for terminals is also possible. DMS family system offers great flexibility in terminals configuration, choice of characteristics (baud rate, SKR or RO, etc.) and secrecy of usage.

DMS will support the following VDU terminals: HAZELTINE Modular One

- VT-100
- Cybernex MDL-110

The essential features are:

- 1920 character screen (80 x 24)
- Addressable cursor positioning
- Transmission rate 300-1200 bauds
- EIA and current loop interface
- Protected and unprotected data operator input or erase from cursor position to end of line

Stand-alone serial printers are connected to DMS via multiterminal controller ports on the IOC. A serial printer can be shared by several VDU's and several functional I/O sub-systems. In most DMS applications, stand-alone serial printers would normally be provisioned on a per functional I/O sub-system basis.

Package NTX001AA21 COMMON BASIC
Feature set SERVICES
Feature CLASS 1 TO 5 SWITCHING
Feature no F0839

DESCRIPTION

DMS-100 FAMILY CAN BE USED TO PERFORM CLASS 1 TO 5 SWITCHING FUNCTIONS. THESE FUNCTIONS INCLUDE:

A) HOMING ARRANGEMENT

B) TRANSMISSION

- ANALOGUE TRANSMISSION
- DIGITAL TRANSMISSION

C) SWITCHING SYSTEM FUNCTIONS

- STORING OF DIGITS
- VARIABLE SPILLING - DELETION OF CERTAIN DIGITS WHEN NOT REQUIRED FOR OUTPUTTING
- PREFIXING OF DIGITS WHEN REQUIRED
- CODE CONVERSION - A COMBINATION OF DIGIT DELETION AND PREFIXING (ALSO TERMED SUBSTITUTION)
- TRANSLATION OF 3 OR 6 DIGITS
- AUTOMATIC ALTERNATE ROUTING

REFERENCE

AT&T NOTES ON DISTANCE DIALLING, SECTION 3.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	BUILT-IN TROUBLE SHOOT DIAG PROG TO ID ALL FAULTY
Feature no	F0840

DESCRIPTION

ALL SUB-SYSTEMS HAVE BUILT-IN MAINTENANCE PROGRAMS WHICH DO THE FOLLOWING:

- FAULT DETECTION - REMOVAL FROM SERVICE - DIAGNOSIS - FAULT LOCATION

A FAULT IS RECOGNIZED FIRST THROUGH THE USUAL OPERATION OF THE SWITCH (PARITY CHECKS, CODE CHECKS, ERROR BYTES, MATCHING, ETC.). THE MAINTENANCE PROGRAM THEN GENERATES MAINTENANCE INTERRUPT, DETERMINES FAULTY UNIT, REMOVES IT FROM SERVICE, REARRANGES HEALTHY UNIT AND CALLS PROPER DIAGNOSTIC PROGRAM TO LOCALIZE THE FAULTY UNIT.

A DIAGNOSTIC PROGRAM IS INITIATED IN ONE OF THE FOLLOWING WAYS:

- 1) FROM THE MAP
- 2) AS A RESULT OF AUDIT REQUESTS, EMITTED PERIODICALLY
- 3) AUTOMATICALLY, WHEN A FAULT IS DETECTED

Package NTX001AA21 COMMON BASIC
Feature set SWITCHING AND TRANSLATION
Feature NORTH AMERICAN LOCAL AND DDD SWITCHING
Feature no F0841

DESCRIPTION

THE DMS DIGIT TRANSLATION CONFORMS TO THE STANDARD NORTH AMERICAN NUMBERING PLAN AS OUTLINED IN SECTION 2 OF AT&T NOTES ON DISTANCE DIALLING. TRANSLATIONS ARE FLEXIBLE ENOUGH TO ACCOMMODATE OTHER NUMBERING PLANS.

Package NTX001AA21 COMMON BASIC
Feature set TONES
Feature NORTH AMERICAN PRECISE TONE PLAN
Feature no F0842

DESCRIPTION

TONES WHICH CONFORM TO THE PRECISE TONE PLAN ARE DIGITALLY PRODUCED. THE PRECISE TONE PLAN IS BASED ON 4 TONES HELD TO ± 0.5 FREQUENCY TOLERANCE AND ± 3 DB AMPLITUDE VARIATION. THESE TONES ARE 350, 440, 480 AND 620 HZ ASSIGNED SINGLY OR IN PAIRS.

DIAL TONE: 350 + 440 HZ AT -13 DBM PER FREQUENCY HIGH TONE: 480 HZ AT -17 DBM LOW TONE : 480 + 620 HZ AT -24 DBM PER FREQUENCY LINE BUSY: LOW TONE INTERRUPTED AT 60 IPM WITH APPROXIMATELY
EQUAL TONE-ON, TONE-OFF TIMES

REORDER, PATHS BUSY, NO CIRCUIT: LOW TONE INTERRUPTED AT 120 IPM

AUDIBLE RINGING: 440 + 480 HZ AT -19 DBM PER FREQUENCY

Package	NTX001AA21 COMMON BASIC		
Feature set	TRUNK TYPES		
Feature	ANALOG	EAS TRUNK (1-WAY,2-W	
Feature no	F1052		

SEE FEATURE NUMBER F0805

Package	NTX001AA21 COMMON BASIC		
Feature set	MAINTENANCE AND TESTING		
Feature	INPUT COMMAND SCREENING	AUTOMATIC LOG ON	
Feature no	F1053		

DESCRIPTION

See Input Command Screening - Terminal Restricted for details on automatic login.

Package	NTX001AA21 COMMON BASIC	
Feature set	MAINTENANCE AND TESTING	
Feature	INPUT COMMAND SCREENING	USER RESTRICTIONS
Feature no	F1062	

DESCRIPTION

Every DMS user (e.g., Switch Maintenance, Trunk Maintenance, Network Management) has a prime function and therefore a repertoire of input commands that the DMS system accepts from that specific user. The input commands are directly related to the function performed by that user and are screened on that basis (i.e., a user is allowed to input only those commands assigned to that user).

All DMS input commands and program names are selectively grouped (telco definable) into any input command class (a privilege class). There are a maximum of sixteen command classes numbered 0 through 15 of which all, none, or any set of these can be assigned to any DMS user. The assignment of command classes to specific users is accomplished via the permit command. This command can also be used to alter the set of classes already assigned to any user or to define new users.

Prior to the assignment of command classes to users (screening), the individual commands that are available in DMS must be first assigned a specific command class. The assignment of a command class to a specific command is accomplished via the PRIVCLAS command. The PRIVCLAS command sets up an internal DMS table of input commands and program names along with their corresponding defined classes. When a command is issued by a specific user, validity checks are performed to ensure this command class is associated with that user's profile, thus providing the command screening mechanism.

In addition to assigning a privilege class number to an input command, the PRIVCLAS command is also used to specify the dump safety status of the command. Input commands which may change (write to) protected store are considered DUMPUNSAFE; all other input commands, which cannot change protected store, are considered DUMPSAFE. A DUMPUNSAFE command is not allowed to execute while an Office Image is being dumped. All commands are initially considered DUMPUNSAFE. Dumpsafe commands should be defined by the telco before an office goes into service. The dump command must also be declared DUMPSAFE. A list of DUMPSAFE commands is given in Table A.

The following guidelines and command class definitions are important:

- Only one command class can be assigned to a command.
- The command classes are not hierarchical in any way; a user with any one class does not necessarily have any others.

- Some commands are unprivileged or have no classes assigned to them.
- Once commands are defined to their respective command classes these can be modified at any time.
- A change in command class becomes effective only after a WARM START has been performed.

Package NTX001AA21 COMMON BASIC
 Feature set SIGNALING AND SUPERVISION
 Feature TRUNKS - DIAL PULSE (10 PPS)
 Feature no F1100

DESCRIPTION

DMS HAS THE SIGNALLING AND SUPERVISION TYPES SUMMARIZED IN THE FOLLOWING TABLE WITH SELECTION OF THE PROPER HARDWARE. FURTHER DETAILS ARE AVAILABLE FROM NTP 297-1001-152 - TRUNK SELECTION AND COMPATIBILITY. DEFINITIONS OF THESE SIGNALS ARE FOUND IN THE AT&T NOTES ON DISTANCE DIALLING.

TYPE	SIGNALLING	METHOD	CONTROL	TYPES	MISC.	FEATURES	PULSE
PULSE	LOOP		IMMEDIATE DIAL	REMOTE MAKE BS			(DP)
REVERSE BATTERY	DELAY DIAL				MULTI-FREQUENCY		E&M
WINK START		(MF)		BATTERY & GROUND			STOP-GO
	(SF)		SINGLE FREQUENCY				
HI-LO							

Package NTX001AA21 COMMON BASIC
Feature set SIGNALING AND SUPERVISION
Feature TRUNKS - MF (7DPS)
Feature no F1101

SEE FEATURE NUMBER F1100

Package	NTX001AA21 COMMON BASIC		
Feature set	MAINTENANCE AND TESTING		
Feature	ALARMS	CARRIER GROUP	
Feature no	F1102		

DESCRIPTION

Carrier Group alarm is used to minimize the effects of carrier failure on the switching system and on service.

The digital lines (T1, DE2/De3/DID) are interfaced to the DMS via the DCM. Whenever a carrier fail is detected in the carrier system, an alarm status (CFL) is indicated on the MAP.

By posting and accessing the digital trunk group, the craftsman can perform tests on the failed circuits and busy them out to prevent the failed circuit from seizing the central office equipment.

Package	NTX001AA21 COMMON BASIC
Feature set	INTERFACES
Feature	BASIC I/O INTERFACE
Feature no	F1196

DESCRIPTION

THE BASIC MAN/MACHINE INTERFACE IS PROVIDED VIA A VISUAL DISPLAY UNIT (VDU). OTHER INPUT/OUTPUT DEVIDES SUCH AS TELEPRINTERS (STAND-ALONE SERIAL OR PARALLEL SLAVED TO VDUS) CAN BE USED IN CONJUNCTION WITH VISUAL DISPLAY UNIT(S) TO MEET THE OPRATING COM- PANY NEEDS AND PROCEDURES. A SERIAL PRINTER CAN BE SHARED BY SEVERAL VUDS. IN A SMALL OFFICE SEVERAL OR ALL USER FUNCTIONS MAY BE PERFORMED FROM A SINGLE VDU TERMINAL CALLED MAINTENANCE AND ADMINISTRATIVE POSITION (MAP).

THE FOLLOWING NUMBER OF SYSTEM TELEPRINTER/VDU CHANNELS AND TELEPRINTER/VDU MESSAGE CLASSES CAN BE PROVIDED:

- 32 SYSTEM TELEPRINTER/VDU CHANNELS - 32 OUTPUT MESSAGE CLASSES - 32 INPUT MESSAGE CLASSES

TELEPRINTER/VDU INPUT AND OUTPUT CLASSES ARE OPERATING COMPANY ASSIGNABLE.

THE STANDARD ASCII/EIA AND CURRENT LOOP HARDWARE INTERFACE IS PROVIDED TO I/O DEVICES.

THE I/O DEVICES MAY BE EITHER CO-LOCATED OR REMOTE (REQUIRE DATA SETS) FROM THE DMS MACHINE.

THE VDUS HAVE INTERACTIVE CAPABILITIES WITH THE DMS MACHINE AND ARE CONTINUOUSLY UPDATED WITH THE SYSTEM STATUS ON DISPLAY AREA.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TSMS PEG COUNT SOURCE AND DISPOSITION UP TO 16
Feature no	F1218

FEATURE SYNOPSIS

For a small POTS office this feature provides point to point OM peg-count for three call types: direct dial (DD), operator assisted (OA), and no prefix (NP).

The TFANIT OMA table, as a 16 x 16 matrix, allows the pegcount of 16 inputs to 16 outputs. The inputs (source) are defined by the incoming traffic separation numbers in the Trunk Group and Line Attribute Data Tables. The outputs (destinations) are defined by outgoing traffic separation numbers in the four data tables: trunk group, line attribute, tones and announcements.

To avoid confusion traffic separation numbers 1 & 2 are reserved in all offices, number 3 in Cama/Tops offices and numbers 4, 5 & 6 in local offices.

The output of the OM group TFCANIT can be accessed by the normal OM OMSHOW and OMPRT commands. An optional summary report is available with NTX088A.

FEATURE DESCRIPTION

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	PEG COUNT OF WARM AND COLD RESTARTS
Feature no	F1319

NTPs AFFECTED:

NTP 297-1001-114N OPERATIONAL MEASUREMENTS (OM)

DESCRIPTION:

Two additional OM registers are required to provide the number of calls disrupted by warm and cold restarts. The new registers are named WINITC and CINITC and are members of OM group CP. (REF: AT&T Technical Specification, section 6.3.3.7.)

DESIGN APPROACH:

Every call in the system is associated with a data area called a CCB (Call Condense Block). There is a unique CCB for each call.

As part of a cold restart, call processing initialization links every CCB in the system to the CCB free queue. This means the CCB is not associated with a call and is available for use. Since this is done for all CCBs, every call is taken down. The actual speech path for the call will still exist, but the system has effectively forgotten about the call and may appropriate its resources during the setup of a new call. This is done in module CPIOUI, and is the definitive measurement of calls lost over a cold restart.

Similarly, during a warm restart, call processing initialization links certain CCBs to the CCB free queue. However, only very few CCBs are reset in this case. Most of the CCBs are retained and the corresponding calls are passed on to call processing code for further treatment. Basing the WINITC counter solely on the number of CCBs reclaimed in CPIOUI does not give a very useful measurement.

In order to get a meaningful count of calls disrupted over a warm restart, code will be added in module CPIOUI to set a bit in the CCB of any call active at the time of the restart. Code will also be added to the error processors to check this bit in the event that a confusion message is received for a call, and, if the bit is set, the OM counter will be pegged and the bit will be reset.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	LGC/DTC BASIC CALL PROCESSING & MAINTENANCE
Feature no	F1323

FEATURE SYNOPSIS

This feature provides peripheral software for the LGC/DTC/LTC peripherals in support of call processing and maintenance. The software is downloaded from the CC during the BCS application process or following a cold restart.

FEATURE DESCRIPTION

The feature supports line and trunk call processing primitives, diagnostic and maintenance facilities and the procedure for application of new software without disruption of calls in talking state.

The software is downloaded from the CC and runs on the XPM processing environment of two tightly coupled 68000 processors - the master processor and the signalling processor.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	LGT/DTC ACTIVITY SWITCHING
Feature no	F1324

FEATURE SYNOPSIS

Purpose for this feature is to maintain a call in the talking state, which is answered and actively supervised connection. An uncontrolled SWACT occurs when there is a trap on the active LGC.

FEATURE DESCRIPTION

a) LTC Swact - uncontrolled

Because of message queuing in the LTC, the data being transferred to the inactive LTC is consistent with the CC call state. For example, call data is transferred, the connection is being resupervised and a SWACT occurs before the new integrity values can be transferred. This would cause the call to come down on the newly active side with an INTEGRITY LOST message. It can be seen that the number of calls that may be affected is directly related to the LTC message loading. The more messages outstanding in queues the greater the probability that the CC, the active LTC and inactive LTC call state are out of sync.

b) LTC SWACT - enhancements

The enhancements will include the following:

i) reduction of messages sent from the active to the inactive unit. Ideally whenever a trunk changes its call processing state from idle to cpb or cpb to idle, only one message should be sent to the inactive unit to reflect the status.

ii) modify the message for active call to include mapping and scanning functions. The current design assume that scanning and mapping functions are not active at the same time. However, there are trunk types that have both functions active together, resulting in potential 'hung' cpb when warm swact occurs.

iii) improvement of warm swact codes to provide robustness and efficiency.

References

BF0363
BF0364

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	ENHANCED REAL TIME INDICATOR
Feature no	F1489

FUNCTIONAL DESCRIPTION

1.0 DESCRIPTION OF MEASUREMENTS

This feature involves the development of a system monitoring tool to be called 'Activity'. The description of this tool follows.

1.1 OVERVIEW

This monitoring tool provides information regarding the following:

System Status This is composed of the standard MTC top level display of the MAP.

Traffic These measurements are extracted from operational measurement tables to reflect the amount of traffic being handled by the office.

Occupancy This uses firmware timing to determine the CPU processor occupancy for different classes of system activities.

Grade of Service This set of measurements reflects customer grade of service of the various queues in the system.

These measurements will allow Telco personnel to accurately determine the performance of their DMS switch.

1.2 QUEUES

Measurements will be taken on the priority 6 scheduler queue, the priority 5 scheduler queue (majority is call processing), and the background level scheduler queue (priorities 2, 3 and 4, mostly maintenance). The CCB queues that will be looked at are the CCB originating queue and the CCB progress queue. These are used for new originating calls and those in progress respectively. Note that the CCB progress queue has a slightly higher priority than the CCB originating queue.

In addition to the queues, various operational measurements will be extracted. There are also some other miscellaneous measurements which will be elaborated upon later.

1.3 TIME SAMPLES

The measurements will be taken and displayed over a sampling period of one minute. With this time sampling, the following phenomenon may occur. A

call is originated in this time sample, and completed in another, or a call is completed in this time sample that was originated in a previous one. This skew may cause some percentage measurements to hover below or above 100%, and not always be exactly 100%. This does not mean that calls are being lost.

2.0 MAN-MACHINE INTERFACE

This monitoring tool will be invoked from the MTC level of the MAP. The tool runs at high priority independent of other processes. The display area of the output is described in the section 'Specific Measurements and Output'. There is also a facility which permits logs to be generated for the measurements. This basically provides a summary of the map display's output. Every 15 minutes, 15 lines of output reflecting the screen display during the last 15 minutes, and one line of summary will be added to the log buffer and the total of 16 lines will be output as a log. The buffer will be large enough to hold 4 hours worth of reports. LOGUTIL must be turned on in order for the log outputs to be available. The subcommands for 'Activity' are enumerated below:

As soon as the Activity map level is entered, the monitoring will be started. Every user to subsequently enter the same map level from other terminals will restart the monitoring for all users. The screen will be updated, and logs will be generated. More details follow with the explanation of each subcommand.

START This subcommand will also cause the monitoring to commence. The screen display will be updated once every minute. From this point, the user can continue watching the display until he/she decides to stop it. If no command is issued to stop, the tool will automatically turn itself off after 4 hours and 15 minutes. When the START subcommand is invoked, the logs for 'Activity' will automatically be started up. The logs will remain running until either the QUIT subcommand is entered, or until the time limit expires. The extra few minutes in the maximum duration is to allow the final log to be output. The timer on the screen will reflect the remaining time of action for 'Activity'. It will also, therefore, reflect the time remaining for the logs.

If START is entered again, the tool continues to execute, but the timer is refreshed. This means that the user can continue for another 4 hours and 15 minutes. Note that if, say, 45 seconds has expired since the last output, the next one will appear in 15 seconds, even though the timer may only register 45 as its seconds portion. At this point, the seconds portion will be zeroed out, and the updates will continue on normally. The time span between each screen update will still be one minute.

When the Activity map level is first entered, it will automatically cause the monitoring to commence. The result will be the same as if START was entered. The use of this START subcommand is to reset the timer to the maximum, or to restart the monitoring if it has timed out.

STRTLOG If this subcommand is entered, a parameter of time must also be entered. This allows the logs to be running independent of the map display. The time parameter specifies for how long the logs are to be running. The maximum time allowable is 255 minutes, or less if the internal maximum time is less (this is an office parameter). The user will not be able to enter a duration greater than the value of the office parameter. If no parameter is entered, it will default to the maximum. The user should note that an office parameter value of less than 16 would not allow enough time for the first log to be output (the first 15 minute log will be output in the 16th minute). It is because of this that if the maximum duration in the office parameter table is less than 16, STRTLOG may not be entered with no duration parameter. Once the time limit has expired, the log system for 'Activity' will shut itself off. If the subcommand QUIT is subsequently entered, the logs will continue to run.

STOPLOG This subcommand tells the system to stop the execution of the logs for 'Activity'. When this is entered, the logs will stop, and the most recent, uncompleted report will not be recovered.

Only the logs will be stopped at this point. The monitoring will continue, and the screen updates will continue as normal.

QUIT This subcommand will cause the user to exit out of the 'Activity' map display. If the logs for 'Activity' were running, having been automatically invoked by initial Activity entry or by the START subcommand, they will be stopped at this point. If the logs had been invoked by the STRTLOG subcommand, then they will continue to run when QUIT is issued.

If a number of people are using the 'Activity' map display and the logs are running, where a STRTLOG had been entered, the last person to QUIT out of the display will be prompted to confirm that the logs are to be left running. This guards against the logs being accidentally left on.

2.1 IMPACT ON MAINTENANCE

If a mismatch occurs between the two CC's, this tool will automatically turn itself off and the machine will remain in synchronous operation. Because this tool runs at high priority, it should not be running if this occurs. The message 'Execution of Activity stopped due to mismatch. Please not invoke Activity for 15 minutes' will be output at this time to any map terminal in the Activity subsystem. If the logs for Activity were running at the time, a log will be generated giving the same message to the user. Note that the user will not be able to invoke 'Activity' for 15 minutes. This is to ensure that if another mismatch occurs, complete diagnostics may be run.

The user may enter the Activity subsystem, and attempt to start the monitoring. A message will be output telling the user of the previous mismatch, and the request for commencement of monitoring will be withheld for 15 minutes. After this time, the monitoring will start, and the tool will continue as expected.

2.2 IMPACT ON MAINTENANCE

This tool runs at high priority and will therefore affect service delays, occupancy and high priority queue measurements. The tool itself will be reflected by about 1% to 2% of the corresponding measurements. The firmware timing used by the tool adds overhead to all activities and is reflected by about 3% to 5% of the measurements CPOCC and SCHED.

The result is that this tool does somewhat reduce the efficiency of the call processing activity of the switch. It is for this reason that the tool will automatically turn itself off if left unattended.

2.3 EXPONENTIAL DISTRIBUTIONS

The measurements for the queues will be calculated on an exponential scale unless stated otherwise. Each entry on this exponential scale will represent a time range. The width of each entry will double with each consecutive entry for a particular measurement. The widths are based on a normal distribution calculated from the number of ticks that transpire for a particular time range. Each time range represents the time in milliseconds that a process waited on the particular queue.

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	AUTOMATIC ALTERNATE ROUTING
Feature no	F1608

FEATURE SYNOPSIS

This feature increases from 6 to 32 the maximum number of alternate routes that can be selected when a particular trunk group is busy.

FEATURE DESCRIPTION

Package NTX001AA21 COMMON BASIC
Feature set MAINTENANCE AND TESTING
Feature IDENTIFICATION OF INTERCEPT OUTPULSE ANI DIGIT 9
Feature no F2066

SEE FEATURE NUMBER F0623

Package	NTX001AA21 COMMON BASIC
Feature set	INTERFACES
Feature	AUTOMATIC INTERCEPT SERVICE (OUTPULSED CALLED NU
Feature no	F2070

FEATURE SYNOPSIS

This feature allows the DMS-100 to interface to an automatic intercept system. Calls to numbers to which a connection cannot be made can be identified on a per route basis.

FEATURE DESCRIPTION

The following types of numbers cannot be connected to:

- vacant office code
- vacant directory number
- deny terminating
- directory number intercept
- terminate on faulty line
- terminate on suspended line.

Treatment of these calls depends on the route treatment that is declared.

Ref: BR0070

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	VDU & PRINTER LINK TERMINAL CAPABILITY
Feature no	F2120

DESCRIPTION

This feature allows a Telco to make a parallel copy of I/O occurring on any device. The parallel copy can be directed to another terminal, a printer, SFDEV file, or a file on any other device. For example, this command can be used to keep a record of a terminal session, or a monitor activity at a remote terminal, or for training of the maintenance staff.

The feature is accessed at the MPA level via the following command:

```
RECORD <START <FROM DEVICE> <ONTO DEVICE>
        <STOP <FROM DEVICE> <ONTO DEVICE>
        <QUERY <FROM DEVICE> <ONTO DEVICE>
```

Start

A recording link is established between the FROM DEVICE and the ONTO DEVICE. If the ONTO DEVICE is SFDEV, tape, disk, etc. the output file name is RECORDFILE.

Both <FROM DEVICE> and <ONTO DEVICE> default to the user's terminal.

The recording stays active until it is stopped with record stop, until the user who started it logs out, or until a restart.

Any number of record links may be active simultaneously.

Stop

A previously established record link is removed.

Both <FROM DEVICE> and <ONTO DEVICE> default to the user's terminal.

Query

If FROM and ONTO are not given, types out all the currently active record links.

If only FROM is given, types out all current record links from that device.

If only ONTO is given, types out all current record links onto that device.

If both FROM and ONTO are given, types out only that record link.

Possible Responses:

"DONE"

- from record start and record stop if they are successful

"RECORDING ALREADY STARTED"

- from record start if a record link already exists between the FROM and ONTO devices

"RECORDING NOT STARTED"

Package	NTX001AA21 COMMON BASIC
Feature set	SERVICES
Feature	DIGITAL RECORDED ANNOUNCEMENT
Feature no	F2303

DEVELOPMENT

BNR softwre and hardware development is required.

FEATURE PACKAGING REQUIREMENTS

Incorporated in NTX001AA Common Basic.

FEATURE DESCRIPTION

The purpose of the DRA is to provide an economical replacement for the Audichron currently used to provide recorded announcements in the DMS-100 family of exchanges.

The DRA shelf consists of a Micro processor based controller, the proper interface to the network speech links and semiconductor memory banks as the recording media.

Both RAM and PROM types of memories will be used as dictated by a given application with the flexibility to implement up to 100% fill on any one type (RAM's or PROM's).

In order to minimize memory requirements and provided that the DMS-100 family transmission parameters and grades of serice are respected, the following can be considered:

- a) Use of other voice digitization techniques than the 8 bits PCM, for voice storage with conversion to PCM for interface to the speech links (DS-30).
- b) Concatenation of sub-phrases and artificial pause generation for the standard recorded announcements (PROM's).

The following features will be required:

1. Co-existance of the DRA and Audichron systems on same DMS switch.
2. DRA retrofit to DMS offices using Audichron.

3. A DMS office capability to support more than one DRA.
4. Recording Methods
 - a) On site, at the MAP using headset or Telephone.
 - b) From an Audichron under MAP control.
 - c) Data filled from Mag Tape, Disk or other DRA - automatically (cold start) or on request from MAP.
 - d) From a subscriber set (optional). The subscriber will be required to dial a special access number to record his announcement. The recording time will be preset (data base parameter) and prompting tones will be used to mark the beginning and end of the recording sequence.
5. The DRA will have up to 30 channels (DS-30 interface) with a capacity of up to 32 seconds per channel selectable in 1 second interval. The absolute recording time available will be a function of the PROM/RAM memory mix used. Using current technology an all RAM provisioned DRA will have a minimum of 250 seconds of total recording time (1 Mega byte of ADDRESSABLE memory).
6. Concurrent operation is expected on all DRA channel irrespective of the recorded Media (ROMS and RAMS) in both recording and playback modes.
7. The DRA will (under CC control) provide the capability of cycling several announcements evolving one or more channels (e.g. Bilingual announcements). These announcements will be accessible on a "BARGE-IN" or "non BARGE-IN" TELCO SELECTABLE option.
8. Intercept treatment of calls:
 - Ringback tone
 - DRA announcement with required cycling sequence
 - Option to re-switch call to operator after DRA cycle
 - Option to provide terminating treatment
9. The RAM's information must be protected against power outages and maintenance actions by insuring that this information is automatically stored on a non-volatile medium (Mag Tape or Disk) and automatically re-loaded after a cold start or power outage or from the MAP on manual request (Maintenance action).

The information stored in the non volatile medium should also contain all the pertinent data on the DRA configuration used (part of data base).

10. Maintenance of the DRA will be integrated into the DMS and the MAP. This will involve maintenance audits and diagnostics automatically run or manually requested at the MAP.
11. MAP/DRA Features:
 - a) MAP capability to identify to Telco Personnel
 - DRA configuration
 - Contents of recorded channels
 - Duration of each message
 - Unused recording time on DRA
 - If MAP is actively used for recordings provide elapsed time/available recording time on a DRA channel
 - b) Capability of re-configuring the DRA.
 - c) Telco personnel should be able to "patch" a subscriber at the MAP to allow on line recording as an interim solution should the feature described in 4d not be immediately available.
12. DRA customized services capability (future option, to be defined).
 - automatic intercept
 - voice messaging
 - etc. (Dictation facility)
13. Incorporation of Special Informatin Tones (SIT) and Location Codes as a data fillable input (office identifiers).

REFERENCE

Notes on the Network AT&T

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OM - OUTPUT ORDERING
Feature no	F2314

FEATURE SYNOPSIS

Currently Operational Measurement (OM) data are polled by downstream processors using protocols/formats which are sometimes fairly rigid, i.e. interpretation of the data is based on a predetermined field order in which the data is received. Consequently changes to the field order will cause the downstream processor to misinterpret data or lose data. This feature will have the capability to control/monitor field order changes during design phase.

The ordering can be in the following fashion:

- a) OM groups within each OM accumulating class
- b) OM classes
- c) fields within each OM group

FEATURE DESCRIPTION

This feature provides capability in the DMS-100 to control the OM groups defined for a particular BCS stream. The control is provided internally by the s/w to limit the addition of new OM groups only after appropriate documentation is available.

It will also provide capability whereby a customer can define the order of OM group outputs within each OM accumulating class. This way telcos can assign the high priority outputs first. This capability will be provided via a new table OMGRPORD where customer defines the order of the OM group outputs within each OM accumulating class.

There is no impact on the existing OM groups or Customer-Tables, Logs or MMI.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OFFICE ID IN TTY OUTPUT HEADER LABEL
Feature no	F2365

DESCRIPTION

This feature is required for Telecoms who have a centralized traffic control department for monitoring a number of switching centres. The control department is equipped with a number of TTY units connected on a dedicated basis, to the various switching centres. The information printed on the TTY's, in general, consists of OM's and SLU's.

In order to easily identify the printouts belonging to a particular C.O., it is required to show an office i.d. on traffic reports generated by the DMS-100 family systems. This office i.d. should contain a minimum of three characters, representing the NNX of a C.O. In order to provide more flexibility in assigning an office, it is suggested space be allowed for of a 10-character office i.d., the remaining 7 characters can be used to assign a C.O. location i.d., at the Telco's discretion.

The office i.d. should be printed on the top left corner of every new page of a printed report.

REFERENCE

RFF 365

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TRUNK OUT OF SERVICE FOR DATA CHANGE
Feature no	F2377

FEATURE SYNOPSIS

Changing trunk data can affect call processing if the trunk is busy. This feature informs the craftsman via a message if all trunks in a trunk group or subgroup are not out of service. Once all trunks are out of service a data change can be made without affecting call processing.

FEATURE DESCRIPTION

Package NTX001AA21 COMMON BASIC
 Feature set SWITCHING AND TRANSLATION
 Feature 1+ PERMISSIVE AND NON-PERMISSIVE DIALLING IN THE S
 Feature no F2449

FUNCTIONAL DESCRIPTION

BACKGROUND

Local Call Area Screening is used to determine whether or not the combination of the local calling area status(local or nonlocal) and the type of call (from standard pretranslator) is valid on any given call. Currently Local Call Area Screening is implemented through tables LCASCRCN and PFXTREAT.

Table LCASCRCN is indexed by snpa and the lca name to result in an LCASCR subtable. This subtable is indexed by a three digit code(npa/nxx) to yield a result of Y(es) if it is a local code and a result of N(o) if it is a nonlocal code. The logical structure of table LCASCRCN is as follows:

NPALOCNM			LCASCR		
-----			-----		
NPA	LCANAME				
---	-----	example	613	otwa	(11)

Table PFXTREAT determines the treatment to which a call is to be routed based on the type of call from the standard pretranslator and the local calling area status in the LCASCR subtable. The logical structure of table PFXTREAT is as follows:

TYPLCLCD			UPDTYPCA	TREAT	
-----			-----	-----	
TYPCALL	LOCAL				
-----	-----	example	dd	y	dd

msca

Any given office can have one of two prefix treatment datafill options. One datafill option requires the use of the prefix digit 1 (1+non-permissive) when making a long distance call and the second datafill option makes the use of the prefix digit 1 optional(1+ permissive). It is important to note that at the present time an office can have only ONE of the two datafill options.

The procedure local_call_area_screen, in program lcascl1, handles checking for valid combinations of type of call and local calling area status during call processing. If the type of call in the call handler block(chb) does not agree with the type of call from field updtypca (updated type of

call) in table PFXTREAT then the type of call in the chb is updated with the one from updtypca and allowed to complete. If the type of call in the chb and updtypca do agree then the call is routed to the treatment in table PFXTREAT. If the treatment is nil_treatment the call is allowed to complete.

Translation verification(traver) also makes use of the tables LCASCRCN and PFXTREAT.

PURPOSE

The purpose of this feature is to provide the telco with the ability to have up to four PFXTREAT datafill options present in the office. This will enable the telco to determine the need for the prefix digit 1 on an snpa and lca name basis rather than on a per office basis.

FUNCTIONAL IMPLEMENTATION

Table LCASCRCN is indexed by a two part key, SNPA + LCANAME, and currently has one field (the subtable LCASCR). The intended approach here is to create a new field in this table called PFXSELEC (prefix selection). This new field will accept one of four choices, OPTL, MAND, and two others which the telco can define if the need arises. To define these other choices the Telco must make a valid entry in table PFXTREAT first then the name used in the entry becomes a valid prefix treatment option and may be used in table LCASCRCN. Any attempt to define more than these two additional choices will be rejected as a bad key and a swerr will be logged by the data dictionary.

Table PFXTREAT is currently indexed by a two part key, TYPCALL and LOCAL. The intent here is to introduce a third part to the key to be placed before TYPCALL. This new part to the key will be the contents of the field PFXSELEC from table LCASCRCN. Since this new key has four choices table PFXTREAT will increase in size to 32 words from 8. The new structure of these tables as envisioned will be:

LCASCRCN: -----

	NPALOCNM			

	NPA	LCANAME	LCASCR	PFXSELEC
	----	-----	-----	-----
Example	613	otwa	(11)	opt1

PFXTREAT: -----

	TYPLCLD				
	-----			UPDTYPCA	TREAT
PFXSELEC	TYPCALL	LOCAL		-----	-----
-----	-----	-----			

Example optl dd y dd msca

The meaning of OPTL in field PFXSELEC is 1+permissive dialing and MAND is 1+non-permissive(mandatory) dialing on DD calls. The Telco will receive table PFXTREAT filled only with the version of the table which they now have in their office.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	CRITICAL MESSAGE PRIORITIZATION
Feature no	F2536

FEATURE DESCRIPTION

This feature provides for an optional method of report prioritization in the log system. The alarm levels of the log system form the basis for prioritization. Message prioritization may be turned on or off for each specific log device.

If prioritization is on for a given device, the report with the highest alarm level at any given time is the one which will be output. Logs with the same alarm level will be output in chronological order.

If the feature is not enabled for a given device, or if the feature is not installed, reports will be output as they are today, in a purely chronological order.

A new log SAVELOG, will be created as part of this feature, but it will not be optional. It will be used to prevent the loss of critical data during restarts.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BELL(U.S.) STANDARD ANNOUNCEMENTS VIA PROM
Feature no	F2566

FEATURE SYNOPSIS

This feature provides Bell (US) standard digitally recorded announcements as an optional alternative to the Bell Canada announcements.

FEATURE DESCRIPTION

Ref: H/W Feature H0389

NT1X76AB circuit pack and NT0V87AB firmware provide a standard set of digitally recorded announcements for BOC market. This set resides in ROM to provide permanent recordings. The speech data is in an AD PCM 4 bit format equivalent in sound to 8 bit PCM.

Subphrases are concatenated into several different announcements.

Standard Announcements for Bell (U.S.)

1. Vacant Code - We're sorry, your call cannot be completed as dialed. Please check the number and dial again, or call your operator to help you.
2. Receiver Off-Hook - If you'd like to make a call, please hang up and try again. If you need help, hang up and then dial your operator.
3. Coinless Coin Sent-Paid - We're sorry, your call cannot be completed as dialed from the phone you are using. Please read the instruction card or call your operator to help you.
4. Partial Digits Received - We're sorry, your call did not go through. Will you please try your call again.
5. All Trunks Busy - We're sorry, all circuits are busy now. Will you please try your call again later.
6. Prefix 1 Not Dialed - We're sorry, you must first dial a "1" when calling this number. Will you please hang up and try your call again.
7. Prefix Not Dialed - We're sorry, you must first dial a "1" or "0" when calling this number. Will you please hang up and try your call again.
8. Voice or Data Channel Failure - We're sorry, due to telephone company facility trouble, your call cannot be completed at this time. Will you try your call again later.

References

H0389 H/W Feature
GS1X76 DRA ROM General Spec
FD1X76 DRA ROM Functional Description
NTP 297-1001-527 DRA User Guide
FDOC BR0566

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	AUTOMATIC BUSY OUT OF TRUNKS UPON INTEGRITY CHECK
Feature no	F2588

FEATURE SYNOPSIS

This feature will perform a signalling test to verify that the two ends of the trunk circuit are capable of sending and receiving signals.

The test will be conducted from the near end office to the far end office. The circuit under test must be either an outgoing or a two way trunk circuit and it must have passed the diagnostics.

FEATURE DESCRIPTION

A request for a trunk diagnostic schedules a test process to operate loop around relays that isolate the trunk circuit card from the outside facility. The test process then calls the self-test routine, for that card, this determines the operational capability of the card. The result of the diagnostic indicates that the card passed the diagnostic or the card failed the diagnostic.

This feature provides an optional signalling test as part of the diagnostics tests. A diagnostic will be performed on the trunk circuit under test. If the diagnostic passes then a signalling test will be performed.

The signalling test will prepare the trunk circuit to expect a start dial or wink signal from the far end office in response to a seizure from the originating office. A clear forward will be sent to the far end if a timeout occurs or the expected signal is received or an invalid message is received.

The results of the test will be available in a log report that indicates a successful test or a failure. Existing logs trk107 and trk106 will be used to report a pass or failure. Presently the trk107 reports a successful diagnostic test. This will also be used to report a the result of a successful signalling test. Likewise the trk106 reports a diagnostic failure, it will also contain information on why the signalling test failed.

In the event of a failure the trunk circuit (clli and external trunk number) and the reason for the failure will be reported in the trk106 report.

The signalling tests will be performed only on trunk circuits where the output start signal is either a wink or delay dial. If the output signal start signal is immediate and the card is a 2x83aa card then we will check for normal battery or reverse battery conditions by scanning the appropriate scan points.

The failure condition will only indicate that the signalling test failed.

Inclusion of the start dial test in trunk diagnostics can be controlled by altering the value of a boolean in table OFCVAR. The telco can choose which trunk groups they want to test by changing the value of a bool from a default (false) to true. The feature will only test circuits that are classified as TRUNK CIRCUITS.

References

FDOC - BR0588

Package	NTX001AA21 COMMON BASIC
Feature set	SWITCHING AND TRANSLATION
Feature	KP & ST ACCEPTANCE ON AN ONI CALL
Feature no	F2599

FEATURE SYNOPSIS

Presently, you can dial only 7 digits from a CAMA position. If KP or ST are dialled, they are refused. This feature's purpose is to permit the user to dial EITHER 7 digits OR KP+7digits+ST.

FEATURE DESCRIPTION

An ONI line calls the CAMA position, which then dials the calling number.

1) Valid Combinations:

- 1a) 7 DIGITS
- 1b) KP + 7 DIGITS + ST

In these two cases, if the 7 digits constitute a valid number, the calling line will be connected to a valid trunk and the call will go through. The cama position will be released.

2) Invalid Combinations:

- 2a) the NNx is invalid
- 2b) more than 7 digits were dialled
- 2c) something other than a digit was dialled in the middle of the digits (e.g. 621KP23)

In these cases, digit reception will stop.

If the number of retries has not been exceeded (position '5 MAX_REORDERS' in table CPOSTIME defines the maximum number of retries), the lamp will flash, and will wait for you to hit the RESET key. Once you hit the RESET key, digit reception will resume, and you can dial a new number.

3) RESET Key:

If you hit the RESET key before 7 digits are received, the number you just dialled will be ignored. Digit reception will resume, and you can dial another number, provided your number of retries has not been exceeded.

Note that this feature will not affect the users of the CAMA position in its present form.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	PASSWORD COMMAND (SHOWPW)
Feature no	F2632

FEATURE SYNOPSIS

A new command SHOWPW will take 'USER_NAME' as a parameter and will display user's PASSWORD as response. This command is not optional but it will not be available at offices with PASSWORD ENCRYPTION feature for security reasons. Availability of the command to the user is controlled by his privclass.

FEATURE DESCRIPTION

Command SHOWPW will accept 'USER_NAME' as a parameter and will display user's PASSWORD.

The PASSWORD_ENCRYPTED is NT controlled OFFICE parameter.

Variable PASSWORD of type HASHED-PASSWORD is substituted for a STRUCTURE that contains both character and encrypted representations. This structure will be updated whenever commands PASSWORD or PERMIT are issued.

One and only one of the two representations is used in the field. Thus no inference can be made on the nature of encryption algorithm. The off-on transitions will be handled by the ASPECT used by TABLE EDITOR in the following manner:

- When encryption is turned on:
 - . encrypt passwords of all legal users
 - . using character representation as input
 - . destroy character representation in the end

The on_off transition is not provided to enhance security.

Ref FDOC - BR0632

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TREATMENT OMS - SEPARATE CATEGORIES
Feature no	F2660

FEATURE SYNOPSIS

The purpose of this feature is to reorganize the grouping of the OM registers which count the number of times each treatment is set. At present they are located in OM groups TRMT1 - TRMT4.

This feature creates six OM groups, each containing registers for one logical treatment category:

1. Customer unauthorized (CU)
2. Customer miscellaneous (CM)
3. Equipment related (ER)
4. Feature related (FR)
5. Resource shortage (RS)

The CU category spans two OM groups due to its large size. The registers in the existing OM groups will be zeroed in BCS-20 and the groups will be removed in BCS-21.

FEATURE DESCRIPTION

The separation of treatments into categories will have important benefits. In addition to providing a more logical grouping of treatment OMS it will allow the resulting data to be routed to different prime user groups for evaluation.

The following defines the new treatment groups:

- Customer unauthorized (CU): These treatments are used to notify the customer that his action is inappropriate for reasons of authorization. Usually this will indicate that the customer has dialed an invalid sequence of digits or has followed improper procedure for the action he is performing (e.g., UNOW - unauthorized OUTWATS call, TDND - toll denied).

- Customer miscellaneous (CM): These treatments notify the customer of call situations attributable to customer action but do not relate to authorization (e.g., PDIL - partial dial timeout, PSIE - permanent signal timeout).

- Equipment related (ER): These treatments indicate failures due to switching equipment malfunction (e.g., SYFL - system failure, RODR - reorder).

- Feature related (FR): These treatments indicate call situations which are attributable to certain call features (e.g., BUSY - busy line, MANL - manual line, CONF - confirmation tone).

- Resource shortage (RS): These treatments handle failures due to shortage of software or hardware resources, indicating an inadequate capacity to handle the presented load (e.g., NOSC - no service circuit, CQOV - CAMA queue overflow).

Ref:

1. For more information on individual treatments see NTP 297-1001- 451 Section 25.

For more information on assignment on treatments to treatment groups see NTP 297-1001-114.

BR0660 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OM - ACT. CALL DISP OFZ
Feature no	F2666

OM - ACT. CALL DISP OFZ (F2666/BR0666)

FEATURE SYNOPSIS

The purpose of this feature is to enhance the Office Traffic Summary by adding two OM Groups, OTS and SOTS, and to implement the pegging of these groups in the POTS environment (except CCIS, CSDDS and Equal Access).

FEATURE DESCRIPTION

The OTS OM Group records calls originating within or incoming into the DMS and the types of agents that these calls terminate to (actual call disposition). Calls pegged include those that are System Generated (ie. machine generated).

SOTS record other information regarding call dispositions such as attempts to get a network path (and failures in doing so), attempts to get speech paths (and failures in doing so) and also the number of outgoing trunk seize failures.

The philosophy of the OTS OM group of registers is to provide pegs for calls initiated in the office and pegs for all possible call outlets in order to satisfy some basic flow requirements. The pegs effectively follow the rule that for one origination there is one termination. In this way, there is a balance between call originations and call terminations.

The OTS registers are pegged based on actual call dispositions (ie. based on actual terminating agent), and monitors actual results instead of failures, unlike OFZ, which are pegged based on intended destinations.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OMS ON PER PM BASIS
Feature no	F2667

FEATURE SYNOPSIS

This feature provides OM - SBU & MBU on per line PM basis

FEATURE DESCRIPTION

This feature will provide two new maintenance OM groups, one (PM) on a per-PM basis and one (PMTYP) on a per-PM-type basis. These These new OM groups will replace the existing OM groups LM, TM, DCM, PM1 and PM2, which will be removed entirely in BCS20. The telco will be given the ability to exclude certain PM's of a given PM type from the per-PM-type total if they desire so as not to have PM's under test influencing the peg and usage counts of the subgroup total fields.

REFERENCES:

FDOC BR0667

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	LOCAL AUDIBLE ALARM RETIREMENT
Feature no	F2692

FEATURE SYNOPSIS

This feature makes it possible to automatically silence audible alarms after a five second delay, when the alarms are being transferred to a remote location.

FEATURE DESCRIPTION

When alarms are being transferred to a remote location, local audible alarms are automatically silenced after five seconds, if no other action has been taken to silence them.

To be silenced in this way, the corresponding tuple in Table ALMSD must have field AUDIBLE set to 'Y'.

If another audible alarm is activated while the first alarm is in its five-second delay, both alarms are silenced at the end of the five-second period.

The audible alarms associated with the Enhanced Dead System Alarm, NCPALARM, are not silenced by this feature while the NCPALARM is active.

Ref: FDOC BR0692

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	LOW VOLTAGE ALARM LOG MESSAGE
Feature no	F2699

FEATURE SYNOPSIS

This feature provides the DMS with a low voltage logs and alarm indication for the -48 volt battery plant of the DMS-100 Family of switches and its remote peripherals.

The feature provides a low voltage alarm log message every 15 minutes while the battery voltage of the switch or remote peripheral is below the low voltage alarm threshold.

FEATURE DESCRIPTION

The monitoring of the -48 volt battery is done by the battery plant charging system. A low voltage alarm is generated when the battery voltage is below a preset limit.

This feature incorporates the low voltage battery alarm in the DMS alarms by using alarm scan points. The battery plant low voltage alarm indicator will be connected to the alarm scan point. When the low voltage is detected it will energize the scan poin.

When the scan point changes state (low voltage detected) a log message will be generated to indicate the condition. At the same time a major external alarm will be raised by the alarm system. Every 15 minutes thereafter, while the low voltage level persists, a reminder log message will be generated to remind of a presence of a low battery voltage. When the battery voltage level returns to normal a log message will be generated to indicate the end of the low voltage level. The major alarm will be silenced.

The log message will indicate the time of the low voltage change, the scan point that detected the condition (scan point name), the change reason (ON/OFF - low voltage ON or OFF) and the time when the power level changed last. This provides an indication of how long the power source remained in the state prior to this change. For the reminder log, the time will indicate when the low voltage was detected.

A status report will be provided by request from the MAP EXT level. The report will contain the low voltage scan points, their state and the time when the scan point changed last.

Ref: DDOC BR0699

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	REORDER PURGE - IBN
Feature no	F2710

FEATURE SYNOPSIS

This feature will purge reorder, the treatment, from all IBN/p-phone software and replace with treatments that relate to the error e.g., hardware resource shortage, feature denied, etc.

Although reorder is still valid as a treatment, its use is now limited to its legitimate definition. The invalid cases are replaced by existing treatments and one new one. Customer group resource overflow (CGRO).

FEATURE DESCRIPTION

Valid definitions for the reorder treatment have been formulated. Treatments assigned in code to reorder but which do not fall under (5) other possible treatments. They are no service circuit, no software resource, feature not allowed, negative acknowledgement, system failure or customer group resource overflow.

Reorder treatment is given to calls for which distorted signals are received during dialling or in pulsing.

Any treatment can be datafilled to return any tone or announcement. All treatments have a corresponding OM register.

Reference:

FDOC B00710

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	FREEZEONREINIT PARAMETER
Feature no	F2715

FEATURE SYNOPSIS

The purpose of this feature is to introduce an office parameter which freeze the inactive side during restarts.

FEATURE DESCRIPTION

A new OFFICE_PARM is introduced through this feature. This parameter is called 'FREEZE_ON_REINIT' and is defined in 'OFCSTD'. The purpose of this parameter is to 'freeze' inactive side during restarts. The inactive side will be frozen every time the active will go for a restart, if FREEZE_ON_REINIT is set to "boolean Y". The default value for the office parm is "boolean N".

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Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	PROTECTION OF UNEXPIRED TAPES
Feature no	F2817

Synopsis

This feature provides new command ERASTAPE and changes existing command TAPECONFIRM. These changes protect unexpired tapes. Unexpired tapes cannot be erased by using the mount command with the tape format option.

Implementation

New command ERASTAPE is used to erase tapes. The system does not check the expiry date before erasing the tape. Volume label "BLANK" is written before the end-of-tape mark to indicate that this is a blank tape created by ERASTAPE command.

The TAPECONFIRM command can now be used to erase expired tapes only.

The following feature package is necessary for this feature to operate:

NTX000AA Bilge

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC BR0817

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DIRP SECURITY ENHANCEMENT
Feature no	F2818

FEATURE SYNOPSIS

This feature increases the Device Independent Recording Package (DIRP) security.

This feature also adds user information to the existing DIRP log message that indicates the use of the DIRP command RSETVOL.

FEATURE DESCRIPTION

Security is increased by generating a DIRP101 log message for some DIRP commands that prompt the user to confirm or reject the command execution.

TEXT2 of the existing DIRP log adds the user login id and volume name to make the message more informative and further increase the DIRP security.

Ref: FDOC BR0818

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	CLOSE LOGS TO SCCS AFTER RESTARTS
Feature no	F2875

FEATURE SYNOPSIS

This feature provides restart and warning messages in the No. 2 switching control centre system (SCCS or SCC2) format for offices that have purchased the SCCS-format logs feature, NTX210AA.

FEATURE DESCRIPTION

Telcos that use an SCCS mini-computer for the downstream processing of logs require all information sent to the SCCS to be in SCCS format. Since the SCCS is treated like a printer or terminal to which logs are sent, restart and warning messages are sent to the SCCS. Prior to this feature, restart and warning messages were not in SCCS format, even if the office had SCCS format logs being sent to their SCCS.

- "Restart message" refers to the message printed out by a DMS-100 on all terminal devices in table TERMDEV after a restart has occurred.

- "Warning message" refers to the message printed out on a device on which logs have been started, indicating that the log buffer for that device has wrapped around, resulting in one or more reports not being printed.

Ref: DDOC AL0152

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION AND TESTING
Feature	NPE - REWORK OF PM MAP DISPLAY
Feature no	F3331

FEATURE DESCRIPTION

The PM maintenance MAP level has been redesigned to provide:

- 1) More efficient use of MAP space,
- 2) More readable presentation of data,
- 3) Greater power and flexibility of basic commands,
- 4) Faster entry to various PM levels
- 5) Better accommodation of New Peripheral displays,
and
- 6) Better fault isolation capabilities when problems occur.

These requirements focus on 4 areas of the MAP:

- 1) Banner displays,
- 2) Alarms (status displays)
- 3) Working area displays,
and
- 4) Command structures.

This feature describes the Phase I PM MAP levels proposed for BCS14. Phase II of the PM MAP level changes will be implemented in the near future.

Phase I modifies 2 major aspects of the PM levels:

- 1) the PM maintenance toplevel display, and
- 2) the method for selecting a PM or group of PMs for maintenance.

These changes make more efficient use of the available MAP space and allow the craftsman to enter the PM level more rapidly.

The Mtc toplevel display will remain the same. The PM Mtc toplevel display will be modified to present only a banner display, not a detailed summary of all PMs as is now given. The PM banner display will summarize the number of PMs in each PM state. The toplevel menu will provide commands to:

- 1) Post PMs according to four criteria (e.g., Post a specific type of PM, a specific PM, the PMs in specified states, or all PMs. For example, Post TM8 would enter the general TM8 level where

individual TM8s could be Posted. Post TM8 0 would enter the general TM8 level and display the appropriate data for TM8 0. The Select command will no longer be used.

2) Enter the PM Status level to obtain a detailed state summary for all PMs. This level provides the display that is currently presented at the PM level.

3) List PMs according to PM state and type as is currently provided. The 'Lst' command will be renamed to 'Disp' and moved to slot 11 on the menu. The PM Type parameter has been made optional. If omitted, all PMs in the specified state are displayed. Additional capabilities for this command will be added in Phase II.

4) Enter the IPML (Inter-Peripheral Message Link) level. if present.

The structure of the standard PM commands (e.g., parameters) (e.g., Bsy, RTS, Tst, LoadPM,...) will not change (except as indicated above). Only the commands for selecting PMs and the PM toplevel displays are changing as part of this feature.

The Post command has two different sets of parameters depending on which PM level has been entered. In the PM level the craftsman can Post:

- | | |
|---|---------------------------|
| 1) All PMs: | Post allpms |
| 2) Any PM subsystem: e.g., TM8 | Post TM8 |
| 3) Any PM: | Post TM8 3 |
| 4) Any set of PMs: | Post TM8 3 5 6 DCM 2 4 |
| 5) All PMs of given type: | Post TM8 all DCM 2 3 5 |
| 6) All PMs in given state set: | Post InSv ISTb |
| 7) All of specified PMs in given state set: | Post TM8 2 4 DCM all ISTb |

In the level for a specific PM subsystem, additional Post parameters are allowed. The craftsman can Post:

- | | |
|---|----------------------|
| 1) All of the above. | |
| 2) All PMs of the current subsystem: | Post all |
| 3) Specified PMs of given subsystem: | Post 2 4 7 |
| 4) All PMs of subsystem in given state set: | Post InSv |
| 5) All of specified PM in given state set: | Post 2 4 6 ManB SysB |

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	NEW O/G IDLE SUPREVISION
Feature no	F3348

FUNCTIONAL DESCRIPTION

Currently one-way outgoing trunks wait until the end of guard timing before making a decision to place the trunk in an idle or lockout state. Similarly, seize attempts are delayed until the end of guard timing. This is in agreement with ATC 1980 Notes on the Network, section 5, paragraph 2.19. However, this paragraph also allows the option of sending a new seizure as soon as a valid onhook is detected. Feature C0820 implements this method in order to:

- (i) optimize exec store and exec ID usage in peripheral modules;
- (ii) reduce the delay between the software make-busy of the trunk and the sending of a forward connect signal; and
- (iii) make the handling of outgoing idle supervision comparable to two-way idle supervision following an outgoing call, and

Impact

This new method of trunk idling will apply to the following kinds of one-way outgoing trunks:

- DMS-100, 200 : All POTS trunks
- DMS-100 Scopedial : All trunks except CO (5X25) trunks and Autovon interswitch trunks.
- DMS-100 IBN, SL-100 : All trunks except CO (5x25), FX (FX1SIG)
- DMS-200 ATV : all trunks except Autovon interswitch trunks
- DMS-250 : All outgoing IMT's, DAL's, and ONAT's that use trunk signalling.
- DMS-MTX : all outgoing pots circuits that use trunk signalling.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TRUNK SIGNAL TIMING CHANGES
Feature no	F3349

FUNCTIONAL DESCRIPTION

Currently there is a delay before all outpulsing of called digits which is controlled by the office parameter PRE_DIAL_DELAY. This delay is required primarily for immediate start trunks, but affects all outpulsing equally.

In the 1980 Notes on the Network, Section 5, paragraphs 2.46 and 2.47, it is indicated that this delay should be 150 milliseconds for immediate start trunks. Furthermore, paragraph 3.28 indicates that for controlled outpulsing a recommended delay is 70 milliseconds.

In order to accomplish this separation of pre-dial-delay times, the office parameter PRE_DIAL_DELAY has been removed and is replaced by the following two new office parameters:

IMMED_PRE_DIAL_DELAY - applies to outgoing and two-way immediate start trunks only, and refers to the delay between seizure and outpulsing of digits. The unit is 10 milliseconds, and the recommended value is 15 (140-150 ms). This parameter is activated by busy and returning to service a trunk on each peripheral serving trunks (eg. DCM, TM, DTC).

WK_DD_PRE_DIAL_DELAY - applies to outgoing and two-way delay dial and wink start trunks, and refers to the delay between the receipt of trailing edge of the start signal, and the outpulsing of digits. The unit is 10 milliseconds, and the recommended value is 8 (70 - 80 ms). This parameter is activated by reloading or resending execs to all peripherals with trunks. This parameter does not affect delay dial or wink start AUTOVON intra-switch trunks.

In order to be able to wait more than 2.55 seconds for the leading edge of a delay dial signal, the units of the office parameter REC_PRE_DD_TIME have been changed from 10 milliseconds to 160 milliseconds. The new recommended value is 3 (320 to 480 milliseconds).

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DEFAULT DATA
Feature no	F3408

FEATURE DESCRIPTION

This feature provides facilities for specifying default values for all types defined in DMS. When a type is added to the Data Dictionary, default values for the type and any subtypes can be specified and stored. Utilities will be provided to retrieve and change the default data as required.

A new table DEFDATA will be created to access the default values. The table will show the type name and the default value for that type. A user can change, add, or delete the default value for a particular type through this table.

This feature will permit for faster input of data to tables. The user does less typing and makes fewer typing mistakes, but the big advantage is that he or she does not have to know what is a reasonable value for a field. This saves time in looking up every value in an NTP.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DRA - RECORDING ON EE PROM
Feature no	F3461

FEATURE SYNOPSIS

This feature introduces electrically erasable prom cards (EE PROM) to the digital recorded announcement machine (DRAM), in order to provide digitally recorded announcements related to mechanised credit card service. Utility procedures would reside in DRAM software which would be called according to user needs.

FEATURE DESCRIPTION

It is desirable that a calling card call in DMS requires no operator intervention. The functions performed by an operator in the course of a calling card call may be handled by TOPS (Traffic Operator Service) in association with the Digital Recorded Announcement Machine (DRAM).

The purpose of this feature is to provide the user interface to DRAM, whereby call processing may request playback of announcements instructing the caller on appropriate actions to take in order to complete a call successfully.

There exists seventeen possible announcements directing a caller in the course of a Mechanised Calling Card Call (MCCS).

The user (e.g. TOPS) would be given the facility to use DRAM as a service circuit so that the user may request the DRAM facility and connect to it. A subsequent request by the user to playback an announcement would result in an announcement played back over the connection. At any point while the playback is in progress, the user may request DRAM to stop playing back. At the end of the playback session the user would request the DRAM facility to be freed.

A new customer table, DRMUSERS will be introduced in this feature which would contain a list of all announcements required by a user and would also include facility for the customer to specify the prime language for the announcements.

In BCS 14 the only user for this interface would be the software for MCCS, in TOPS. MCCS announcements do not require a queuing facility. Hence, no queuing facility has been included in this feature. However, the initial procedure call from the user to this interface would include a Boolean which would indicate that a user requires queuing. For subsequent features, if queuing is required, the facility can easily be provided by expanding the existing code.

The MCCS announcements in this feature would take the form of pre-recorded phrases on two NT1X76CA double density EPROM cards. These announcements and their corresponding phrase numbers (PHRASENO) would be specified in the DRAM NTP. Using the 'ASSIGN' command in DRAMREC C1 increment these phrases would be 'ASSIGN'-ed in software, just the same way as standard announcements like the Blank Directory Number is 'ASSIGN'ed.

Provision would exist in software to 'RECORD' online the MCCS phrases on NT1X79AA electrically erasable PROM cards (EEPROM) when these are available. The procedure for recording would be the same as recording on the existing NT1X77AA RAM cards.

It is to be noted that only English MCCS phrases will be supported by the NT1X76CA EPROM card in this feature.

For offices without the NT1X76CA EPROM cards the MCCS phrases will have to be individually recorded, the procedure for 'RECORD'-ing being the same as for the standard announcements in DRAM. Note that the 'RECORD' command has been modified. See document CO980MM.

The following is a list of all the MCCS related announcements. The phrase names used are arbitrary. The choice of phrase names would be left to the customer except for the phrase names of the digits 0 to 9. For digits 0 to 9, both in English and French the phrase names given below must be strictly adhered to. As for the other phrases related to the MCCS announcements, the following have been chosen as it is difficult to choose meaningful names for each announcement.

PHRASENAME -----	CONTENTS -----
1. MCCS1ENG	Please dial your card number or zero for an operator now.
2. MCCS2ENG	Please dial your card number again now. (pause) The card number you have dialed is not valid.
3. MCCS3ENG	Please dial your card number.
4. MCCS4ENG	Please hang up and dial zero plus the number you are calling. (pause) The card number you have dialed is not valid.
5. MCCS5ENG	You may dial another call now.
6. MCCS6ENG	Please dial the number you are calling again now. (pause) The number you have dialed is not correct.
7. MCCS7ENG	Please dial the number you are calling.
8. MCCS8ENG	Please hang up and dial zero plus the number you are calling. (pause) The number you have dialed is not correct.
9. MCCS9ENG	Please hang up and dial zero plus the number you are calling.
10. MCCS10ENG	Valid number, unrestricted PIN, RAO XXX.
11. MCCS11ENG	Valid number, restricted PIN, RAO XXX.

12. MCCS12ENG	Valid number, unrestricted PIN, RAO unavailable.
13. MCCS13ENG	Invalid number, please dial again now.
14. MCCS14ENG	Invalid number, please hang up.
15. MCCS15ENG	Please hang up and dial direct. (pause) This number cannot be dialed as a sequence call.
16. MCCS16ENG	Thank you.
17. MCCSALERT	(alert tone following an announcement)
18. ENG1	One
19. ENG2	Two
20. ENG3	Three
21. ENG4	Four
22. ENG5	Five
23. ENG6	Six
24. ENG7	Seven
25. ENG8	Eight
26. ENG9	Nine
27. ENG0	Zero

Similarly, the French phrases would be as follows:

1. MCCS1FRE	-----
-	-
-	-
-	-
-	-
-	-
-	-
16. MCCS16FRE	-
17. FRE1	-
-	-
-	-
-	-
26. FRE0	-----

Since, the NT1X76CA EPROM cards would only support English MCCS announcements, the French phrases will have to be recorded if an office requires bilingual MCCS announcements. Such RECORD-ings may be done on the NT1X79AA EEPROM cards. The non-volatile nature of the EEPROM cards would render these announcements safe from accidental corruption as is common with the NT1X77AA RAM speech memory cards.

The number of cycles of a particular announcement to be played back, will be a datafillable parameter in Table ANNS. The number of cycles required for the MCCS announcements is 1.

The DRAM audit process will be enhanced in order to include audits on the NT1X76A EPROM and the NT1X79AA EEPROM cards. The existing announcement audit would be responsible for auditing the channels through which the MCCS announcements would be played back.

When DRAM is being used as a facility through this interface, the announcement members involved would be subjected to the same OM pegging as the standard announcements.

Announcement channels would not be dedicated to any particular MCCA announcement as is the current configuration for standard recorded announcements. Instead, MCCA would exist as a group in Table ANNS, having members in Table ANNMEMS and each member associated with a channel on the MTM. Any of the MCCA announcements may be played back through any one channel. This is necessary because TOPS needs immediate connection to the MCCA announcements as opposed to standard announcements where a caller gets an audible ring while waiting to hear an announcement. Since any particular channel is not dedicated to any specific MCCA announcement, the MCCA announcements would be 'single track' announcements. Hence, the Table DRAMTRK which specifies the tracks pertaining to each language will not be used for the MCCA phrases.

It should be noted that the cycle time for the MCCA announcements is variable and will have to be manipulated within DRAM software. Hence, during datafill the cycle time input in Table ANNS for the MCCA group will be disregarded. The maximum cycle field will be appropriately datafilled according to the need of the user. In the case of MCCA it will be 1.

DUMP and RESTORE process, when changing over from one BCS to another will be affected by this feature as an additional field, antype, (announcement type) has been introduced in Table ANNS. For Merchandised Calling Card Service the ANTYPE is MCCA. For standard announcements like PSPD, BLKDN, the ANTYPE is STND, which stands for standard.

To summarise, this interface would permit user specified announcements to be played back and the user is responsible for making connection to the announcement channel as well as supplying numeric digits to be played back where necessary, e.g. the RAO number in the case of MCCA. The user would be informed when the playback process is completed. The user would then take down the connection to the announcement channel and ask for DRAM to be freed.

References:

DRAM NTP : 297-1001-527
AT&T Technical Advisory No. 62

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TERMINATING NPA AMA RECORDS
Feature no	F3473

FEATURE SYNOPSIS

Feature description is not available.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	VARIABLE TIMING - DP TRUNK RECEPTION AND OUTPULSIN
Feature no	F3483

FEATURE DESCRIPTION

This feature for the Telcos optionally allows variable settings for make/break on TM DP outpulsing, and minimum received DP pulsewidth on DP trunks only.

Capability will be provided via OFCPARMS to allow the Telcos to change these timings as required. The default timings will be the same as used now (ie. 60 msec for make and 40 msec for break on TM DP outpulsing, and 25 msec for minimum received dp pulsewidth)

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	RADR WITH DTMF
Feature no	F3499

FEATURE DESCRIPTION

The Receiver Attachment Delay Recorder (RADR) is many processes (two per Receiver kind) running at the same priority as call processing. For each receiver kind, two processes request receivers with one process taking care of the case where attachment must wait and the other taking care of everything else.

A queue is maintained, which both processes have access to, on which the time of origination of the waiting requests is kept, until the request is met, or the upper threshold reached. This is scanned every half second.

Together, the processes time how long it takes to get these Receivers, using a lower and upper threshold, and also record the number of requests actually made. In this way, RADR tests machine congestion of the DMS under various traffic loads within different boundaries.

Previously, RADR tested only MF Receivers, but will now be expanded with the capability to test any Receiver type at the discretion of the operating company. This includes DTMF.

WARNINGS

WARNING : Turning on RADR for any Receiver type will affect the RCVR OM's of that Receiver type. The particular RCVR OM fields that will be affected are : RCVSZRS, RCVSZ2, RCVOVFL, RCVQOVF, RCVQABAN.

WARNING : As RADR can now test the availability of any Receiver type available in the Telco, the possibility exists that having RADR and DTSR turned on at the same time for line Receivers will have an impact on the corresponding OM's in both groups. This impact will be a result of the possible competition between both features for the line Receivers.

All Table Control in RADR is being replaced with New Table Control but this will be transparent to the user.

3.1.1 RADCALLR is specified. The range of valid values is 0 to 1800 (requests per hour). A value other than 0 activates RADR, while 0 deactivates it.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	PER CALL CAPACITY ENHANCEMENT
Feature no	F3740

FEATURE SYNOPSIS

This feature will provide a real time enhancement by improving selected high running call types real time performance. For line to line and trunk to trunk optimization.

FEATURE DESCRIPTION

This document describes the approach taken to provide a speedup of specific high running call types on the DMS-100 family of switches.

This speedup will be effective in BCS 14. The call types involved include:

- MF Intertoll
- DP Intertoll
- Call types using DTMF receivers/senders (lines and trunks)
- Simple line to line
- Line to local trunk
- Local trunk to line
- MF Incama ANI
- DP Incama ANI
- any call will benefit from the new way of dispatching duplex messages with precomputed headers.

The above mentioned call types will not have any major semantic changes made to them. Instead, some call types will use faster versions of existing procedures and others will make use of pre-built messages sent to peripheral processor.

A new way of sending duplex messages to network modules is implemented; it uses precomputed message headers for pathctrl/ npathctrl messages sent by the network software and updated by the maintenance software any time the route table is updated. For these messages the data part of the message is prebuilt by the initialisation software in 4 RAM buffers, the variable data of the message being filled in before the message is sent. A customised version of \$CMC_OUTPUT will assemble the message directly in the cmc buffer (if cmc is idle) or in a buffer to be queued.

All call failures will be treated in the same way as currently exists. However, failure paths will not have any speedup applied to them.

There will be no changes made to the maintenance system.

The speedup will apply to calls within the realm of line to line, line to trunk, trunk to line, and trunk to trunk call processing. The speedup resulted from the new way of dispatching duplex messages will apply to any type of call.

Certain combinations of calls within the above mentioned call types will not be fast. Most calls will take advantage of the faster procedures unless they diverge from the normal flow of a call. In this case, the call will revert to normal (slower) code.

This feature will be spread throughout local/toll call processing code. As this feature is not optional, no modularity is required.

This speedup is aimed at reducing above mentioned call types by 0.5 ms each.

All subsequent changes to these call types involving peripheral processor message changes must be included in the fast call processing stream or the benefits of this speedup will be short lived.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TERMINATING NPA IN AMA RECORDS
Feature no	F3768

FEATURE DESCRIPTION

The problem of filling in the terminating NPA on seven digit local calls can be performed via the use of the 'Z' preselector in the normal POTS pretranslator.

Changes to the Pretranslator code will be made so that the NPA-DERIVED bit in the AT&T LAMA records can be set properly.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OM TAPE - SUPPRESSION OF UNEQUIPPED MEMBERS(D RECO
Feature no	F3776

FEATURE DESCRIPTION

INTRODUCTION

When an OMCLASS scheduled & activated in table OMACC & OMTAPE, the Operational Measurement data will be transmitted to tape or via DATAPAC to telco's data center as per telco's instruction. The quantity of O.M. data being transmitted could be found excessively high. A possibility of data corruption during data transmission exists due to congestion.

Currently, a massive volume of "D" records is being dumped for unequipped members, up to the maximum size of equipments. This produces an excessive volume of zero data, in such OM groups as: CARR, TRK, LMD, etc.

By preventing measurement data being dumped for unequipped members, this feature will solve the data congestion problem.

DESCRIPTION

This feature will output the "D" record if found in the INDEXTOINFO proc. Therefore, just output the equipped members of the group, and change all the "K" records into sequential order.

OTHER CHANGE

In the "C" record, the Single(S) or Double(D) precision indicator should be moved before the 'Y' and 'N' for each group listed in type G record associated with the HOLDING class. The reason is to minimize the changes for downstream programming as the group might grow with ongoing expansion in DMS.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OM PRINT - SUPPRESSION OF ZERO DATA
Feature no	F3777

FEATURE DESCRIPTION

The prime function of this feature is to save real time, conserve paper, eliminate the long zero-data report and minimize the possibility of data congestion problems when the high volume of Operational Measurement data transmit into output devices (such as printer or UDC).

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	AMA REAL TIME ENHANCEMENTS(ATT FORMAT)
Feature no	F3778

FEATURE DESCRIPTION

The purpose of this feature is to provide a real-time optimization of the current methods of handling AMA data within the AMA system.

These optimizations can be broken down into three components:

1) Transferral Enhancements

Wherever possible, copying of AMA information from the Call Condense Block (CCB) to a recording medium will be done on a 'fast-block-move' basis. Since such information transferral is done on every recordable call a significant overall real time savings can be expected from this particular improvement.

2) Formatting Enhancements

The major real time savings which will be realised in this feature will come from a shift in the handling of AMA data at the end of a call.

The change which this feature will provide is to eliminate the time consuming attaching/detaching of recording units at the end of a call.

The AMA information will be formatted directly from the CCB at the end of a call and written directly into the AMA buffer. Because AMAPROC and Call Processing run at the same priority, no real time expenditures will result from this 'shift'.

Because there will be fewer recording units required a data store savings can be expected in the number of recording units engineered for each office. However since call processing can not 'afford' to wait for DIRP to empty a full AMA buffer before it writes to the buffer, additional AMA buffers will be internally provided to ensure that a means of writing AMA data to AMA buffer exists at all times.

3) Procedural Enhancements

Wherever possible timing conversion routines will be streamlined and minimized to provide a maximum possible

real time enhancement.

{) Important Note

The calls that will be affected by formatting directly from the ccb at the end of the call are those where ama information is located in the amadata of the ccb and not in a recording unit. This would represent about 95% of all calls in a normal DMS100, DMS200 or DMS100/200 office.

Notable exceptions which entail putting ama records into recording units before call disconnect, and which will not benefit from this enhancement include:

- IBN Originating Calls Which Use The CCB For Call Translation
(Virtually all billable calls in an IBN office) - Call Forwarded Billable Calls - Terminating Records such as INWATS, FNT, and LUSTERM - Vertical Service Records (3WC, CFW)

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	MINOR POF ENHANCEMENT
Feature no	F3779

FEATURE DESCRIPTION

This feature will implement some changes to the POF system. These are:

1. Optional removal of extraneous prompts for the activate and delete commands. Prompts can be turned off by specifying "np" for noprompt in the activate /delete commands.
2. Differentiation between activating/deleting all Data Order Files and all Pending Service Orders.
3. A "help" command will be added to list all available commands in PENDING.
4. Restricting datastore usage of the NPENDING and DMOTAB tables.
5. Minor changes to the MMI of the DISPLAY, ACTIVATE and DELETE commands. These commands are described fully in the MMI section of this document.

Package	NTX001AA21 COMMON BASIC
Feature set	FACILITIES
Feature	LOOP MONITOR ELIMINATION ON 2X83
Feature no	F3811

FEATURE SYNOPSIS

This feature provides a method by which the trunk functions normally in the presence of momentary continuity faults.

FEATURE DESCRIPTION

The purpose of this feature is to implement a method by which the trunk can function normally and not be affected by momentary continuity faults. To implement this the 2X83 trunk will no longer report errors while in the idle or off state. Invalid states will only be detected upon initial seizure. This makes 2X83 trunks similar in performance to other trunks.

Currently with NT2X83 (simple reverse battery outgoing) trunks all state transitions are verified by checking loop continuity (e.g. looking for short or loop faults) on the line. This verification is performed by examining the state of scan points which reside on the NT2X83 board. If the scan points are determined to be in an invalid state then an error is reported and the trunk is placed in a system busy state. Needless to say, if a call is terminating to this trunk then the call is treated with an appropriate error function.

In some instances the checking for invalid scan values is inappropriate. This is usually due to the fact that the other end of the trunk may only present the invalid condition for a short period of time. After which the trunk will return to normal. Although the invalid state is long enough to surpass the hook filter it is still part of the disconnect sequence and should be treated as such.

An example of this would be a 'cutoff on disconnect' option on the terminating end of the trunk. This option causes an open to be presented to the NT2X83 but in fact this open is part of the disconnect sequence. With the current implementation, if the open exceeds the hook filter time then an error message is reported and the CC then takes appropriate action (e.g. places the trunk in a system busy state).

EFFECT OF OPEN ON A TRUNK STATE

With this feature, the effects of an open on the trunk state (on the MAP) will be as follows :

1) Trunk sees an open while idle.

Nothing should happen if the trunk is IDLE and an open suddenly appears : the trunk should remain IDLE.

2) Trunk is open and attempt to seize is made.

If the trunk is currently IDLE, but open, and a call to it is attempted, the call should NOT be able to terminate : this feature checks the loop state of the trunk before permitting seizure. In this case, the trunk will become SB (system_busy), and a TRK121 log should be generated, with a trouble_code of 'REVERSED_TRUNK'.

3) Trunk is open and an RTS is done.

If the trunk is posted on the MAP, with a state of either IDLE or SB (cf. above), and an attempt to BSY and RTS it is made, the trunk will go IDLE if its loop state is now correct. However, if the trunk is still open (or short), it will then take a state of LOCKOUT until the open disappears and the loop state is correct (i.e., the state will change from 'LO' to 'IDLE' as soon as the loop state goes back to normal.

This is because the idling procedure detects a fault on the scan state of the trunk.

4) Trunk detects an open while connected.

If the trunk is engaged into a call (a proper connection is established) and becomes open, nothing should happen (i.e., that open should be ignored and the trunk state should not change).

When the call is finished, DMS will try to IDLE the trunk. If the invalid scan state (e.g., open) has disappeared, the trunk will appear as IDLE. If, however, the scan state is still invalid (e.g., the trunk is still open), the trunk will go into LOCKOUT. This is, as item 3 above, due to the fact that the idling process completes only when a proper scan state is achieved.

The trunk will go from LOCKOUT to IDLE once the invalid scan state (e.g., open) disappears and a proper onhook/offhook state exists.

REFERENCES

- 1) LSSGR Local Switching System General Requirements, AT&T 1980.
- 2) NOTES 1980 Notes on the Network, AT&T Network Planning Division.

Package	NTX001AA21 COMMON BASIC
Feature set	FACILITIES
Feature	SIX PORT CONT AS 2-THREE PORT CONT CKT
Feature no	F3812

FEATURE SYNOPSIS

This feature will permit a NT3X67 conference circuit card (1 x 6 ports) to be used as 2 x 3 ports similar to the NT1X31 card conference circuit card. In fact, the feature will take full advantage of the hardware capability of the NT3X67 conference circuit card which can be split as 2 by 3 ports.

FEATURE DESCRIPTION

The NT3X67 will be split by putting circuits 0,2,4 on one group and circuits 1,3,5 on the other. This is the only choice because of the way the hardware works.

From the end user point of view, nothing will change. All conference calls features will act the same way as before. The only difference will be that the user will need to specify the card code in the table CONF3PR. Thus, the software will know which card code is being used in order to implement the appropriate procedures.

This feature have no impact on actual users of conference call such as TOPS, Service Analysis, IBN, etc. Everything will work the same way as before.

NOTE 1. OM's will not be affected by this feature.

note 2. Once the configuration of the NT3X67 card has been set up, it cannot be changed without changing datafill.

note 3. The NT3X67AA card has the same provisioning rules as the NT1X31AA card.

DB Tables affected - CONF3PR

A Card - Code field is added

Ref: FDOC BC0982

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	CALL TIMING OFFICE PARAMETER REVISION
Feature no	F3813

FEATURE SYNOPSIS

There are currently three distinct sets of office parameters that deal with timing of AMA-billable calls. This proliferation of timing parameters is difficult to support and confusing. Consequently, this feature proposes to eliminate these three sets, and replace them with three new parameters:

- (a) MINIMUM_CHARGE_DURATION
- (b) SHORT_TIMED_RELEASE_DISC_TIME
- (c) LONG_TIMED_RELEASE_DISC_TIME

FEATURE DESCRIPTION

This Feature Desc. is divided into four parts. Section 1 identifies what timings need to be done. Section 2 describes the current assortment of parameters, and which calls they apply to. Section 3 describes the new parameters. Exceptions are covered in section 4.

1 Call Timing Requirements

There are two signals sent from the called party of a call that need to be timed - answer, and called party disconnect.

2 Old Call Timing Office Parameters

Before BCS15 there were three distinct sets of office parameters that dealt with timing of calls:

- (i) TOLL_ANSW_FLTR
-used by trunk to trunk and some trunk to line calls
& CLD_DISC_FLTR
-used by trunk to trunk and some line to trunk calls
- (ii) NORMAL_LN_ANSWER_VER_TIME
-used by line to line and line to trunk calls
& NORMAL_LN_CLD_PARTY_DISC_TIME
-used by line to line, some trunk to line, and some line to trunk calls;
- (iii) LN_LAMA_TRK_ANSWER_VER_TIME & LN_LAMA_TRK_CLD_PARTY_DISC_TIME
-not used at all

3 New Call Timing Office Parameters

The six office parameters referred to in 2 are replaced by the following three new parameters in BCS15:

(i) MINIMUM_CHARGE_DURATION

A call is defined as answered when the called party offhook exceeds this value, expressed in 10 ms units (LSSGR section 8.1.2.1A). Replaces TOLL_ANSW_FLTR, NORMAL_LN_ANSWER_VER_TIME, for all applications that used those office parameters. The range is 16 to 4080 (160 ms to 40.8 seconds). The recommended value, for Telcos that have a regulatory requirement not to charge calls of duration less than 2.0 secs, is 208.

(ii) SHORT_TIMED_RELEASE_DISC_TIME

The time, in 10 ms units, for which a called party onhook is timed for before releasing the connection to the calling party. This parameter will typically be used in calls with low set-up costs or scarce resources that must be deallocated quickly after use. An example of a call type that uses this parameter is Line-to-Line. The range is 16 to 4080 (160 ms to 40.8 seconds). The recommended value for this is 200 (2 seconds). This value is sufficiently short to free up resources quickly upon disconnect in a local call - but long enough to ignore flashes propagated into the network by older PBX's.

(iii) LONG_TIMED_RELEASE_DISC_TIME

The time, in 10 ms units, for which a called party onhook is timed for before releasing the connection to the calling party. This parameter will typically be used in calls with potentially high set-up costs. A typical application for this parameter is in Intertoll Trunk-to-Line or Cama trunk-to-Intertoll trunk calls. The range is 16 to 4080 (160 ms to 40.8 seconds). The recommended value for this is 1600 (16 seconds). This longer value gives subscribers more leeway in calls with a high set-up cost.

4 Exceptions

This feature applies only to those calls that were previously affected by the parameters that are being deleted. Previous references to CLD_DISC_FLTR will be replaced with references to LONG_TIMED_RELEASE_DISC_TIME and previous references to NORMAL_LN_CLD_PARTY_DISC_TIME will be replaced by references to SHORT_TIMED_RELEASE_DISC_TIME. All references to TOLL_ANSW_FLTR and NORMAL_LN_ANSWER_VER_TIME will be replaced by references to MINIMUM_CHARGE_DURATION.

References

1. LSSGR Local Switching System General Requirements, AT&T 1980.
2. NOTES 1980 Notes on the Network, AT&T Network Planning Division,
Fundamental Network Planning Section.
3. FDOC BC1108

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	CARRIER ENHANCEMENTS
Feature no	F3815

FEATURE SYNOPSIS

This feature provides the following major enhancements in carrier maintenance:-

- * -provide packaging option in carrier maintenance software,
- * -provide CBSY and PBSY in carrier state,
- * -introduce "CARRIER" map level to replace "DS1STAT" map level, and,
- * -introduce carrier maintenance table to control different alarm aspects and the number of system return-to-service's on each carrier.

FEATURE DESCRIPTION

Carrier is defined as the low-level protocol which maintains the communication on links connecting DMS peripherals to channel banks, DMS peripherals to remote DMS peripherals, or remote DMS peripherals to remote DMS peripherals.

There are two carrier standards served by DMS family of switches. They are differentiated by the provisioning of channels and alarms. Details of these two standards may be found in the following documents:-

- ATT PUB 48501 LSSGR,
- CCITT Recommendations Yellow Book Geneva 1980.

In this document, carriers specified by the former document are called 24-channel (DS1) carriers, and carriers specified by the latter document are called 30-channel (PCM30) carriers.

It should be noted that the term "CARRIER" is used to replace "DS1STAT" currently being used in the map. This is because DS1 specifies only 24-channel carriers.

This feature will enhance the carrier maintenance software in the following manner:-

Software Organization

This feature allows the carrier maintenance software to be packaged according to the standards being served by a DMS switch.

Man-Machine Interface

This feature allows more information, e.g. CBSY, PBSY, to be displayed in the map. CI commands are enhanced. POST conditions are increased. Disp command is added to display more details of a posted carrier.

Maintenance Control

Carrier maintenance table (CARRMTC) will be introduced. It allows the switch administration to datafill maintenance control information in central control and peripherals.

Carrier maintenance software constitutes subsystems which are responsible for busying, testing, auditing, and rts'ing carriers as well as displaying and logging carrier alarms.

SOFTWARE ORGANIZATION

The carrier maintenance software will consist of two main categories of subsystems:-

1. Generic Subsystem CARRMSUB

This subsystem is responsible for functions common to carriers of all standards. It will, therefore, reside in area COMMON.

2. Variant Subsystem CARRMDS1, CARRMD30

Each variant subsystem is designed to meet a specified standard. CARRMDS1 is responsible for 24-channel carriers and CARRMD30 is responsible for 30-channel carriers.

All variant subsystems will reside in area COMOPT and should be packaged according to the carrier environment being served by the DMS switch. If a DMS switch is required to serve both 24-channel and 30-channel carriers, both CARRMDS1 and CARRMD30 may be packaged.

In this feature, only CARRMSUB and CARRMDS1 will be implemented. Users should refer to FDOC C1076 for the implementation of CARRMD30.

MAN-MACHINE INTERFACE

The existing "DS1STAT" map level will be replaced by "CARRIER" map level.

References

1. ATT Pub 48501 LSSGR
2. CCITT Recom. Yellow Book 1980
3. FDOC C1075 and C1076

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	SYSTEM SPEED UP
Feature no	F3824

FEATURE SYNOPSIS

Enhancements have been made to speed up call processing and increase the real time capacity of the machine.

FEATURE DESCRIPTION

There are three software changes:

1. Extended Call Processing Environment

An extended call condense block (ECCB) similar to the CCB has been added to simplify complex feature code.

Table affected is OFCENG. There is a new parameter NUMECCBS. These blocks are 48 words each. Activation requires a cold restart or reload restart. For international applications currently, provide one ECCB for every CCB in the office.

MMI/CI commands affected are LOGUTIL, MAPCI, OMSHOW.

An OAUOT log has been added. It is an INFO log type with no alarm. The number is AUOT 263.

The CPSYS increment of MAPCI has been changed to incorporate the ECCB. The ECCBS data resides with the existing call processing resources data.

OMSHOW CP2 is the new CP operational measurement, an extension to the current CP OM. The counts are:

ECCBSZ - the number of ECCBs in use by applications
ECCBOVFL - ECCB is requested but none available
ECCBTRU - traffic usage of the ECCB.

2) Increase to Size of Message

The size of incoming messages, CPLETTERS and SOS messages has been increased for better data exchange between processes. This will reduce the number of messages and increase real time capacity.
No data tables are affected.

3) PROTEL DMS Compiler Changes

New op codes have been added to speed up processing in compiler version 500207. No data tables are affected.

References

FDOC fF0447

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OM OUTSIDE PLANT MEASUREMENTS - PHASE I
Feature no	F3825

FEATURE SYNOPSIS

This feature provides new OM measurements on PM initializations, cutoffs and outside plant circuit failures.

This feature does not include the addition of any pegs for the new peripherals.

FEATURE DESCRIPTION

The following pegs are added:

1. PM made system busy from an in-service (INSU) or in-service-trouble (ISTB) state. The pegs are LMSBP, DCMSBP and TMSBP.

2. PM man-busied from INSV or ISTB. The pegs are LMMBP, DCMMBP and TMMBP.

Note: LMMBP and LMSBP are also pegged when a warm-take-over takes place.

3. Number of terminals cut off when a peripheral is made system-busy from an INSB or ISTB state. The pegs are LMSBTCO, DCMSBTCO and TMSBTCO.

4. Number of terminals cut off when peripheral is mae man-busy from an INSB or ISTB state. The pegs are LMMBTCO, DCMMBTCO and TMMBTCO.

Note: LMMBTCO is incremented when a warm or cold take-back occurs from a man-busy state. LMSBTCO is incremented when a warm or cold take-back occurs from system-busy.

5. Number of outside plant circuit failures detected by system-called diagnostics. The pegs are LMCCTOP, DCMCCTOP and TMCCTOP.

Note: Line faults detected by the ALT tests (line insulation and long tests) will also cause LMCCTOP to be pegged.

The following pegs will be removed:

1. LMINITS, DCMINITS and TMYNITS currently exist and are incremented when PMS are reinitialized. These are replaced by the MB and SB groups above. The position of these field names maintained in the OM groups so that the positions of the other field names are not shifted. The PM-init pegs will always have

value '0'.

References

OM NTP

R0588 (outside plant cct failures)

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	ENHANCED PRIORITY TERMINAL
Feature no	F3826

FEATURE SYNOPSIS

This feature enables non-preferred background processes to be performed from a priority terminal.

FEATURE DESCRIPTION

This enhancement to the priority terminal feature will modify the scheduling of preferred background processes so as not to completely lock out non-preferred background. This will be done by periodically changing the order of searching the ready queue before looking at the preferred ready queue.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	MPC ROM MAINTENANCE AND CC CONTROLLER
Feature no	F3832

FEATURE SYNOPSIS

The purpose of this feature is to provide basic maintenance routines in ROM and facility to down load from CC.

FEATURE DESCRIPTION

ROM Maintenance is invoked at power-up, hardware reset, error recovery, or by CC command. It sends, receives and processes messages from the CC. Since ROM Maintenance operates as a separate entity from the main software load, it has a unique set of CC messages. The MPC ROM maintenance messages do the following:

- Query the status of the MPC
- Initiate the running of diagnostics
- Download application software
- Start execution of the downloaded application

ROM Maintenance messages are part of CC messaging. Multo-Protocol Controller (MPC) ROM maintenance is an internal action with no user interface.

In ROM Maintenance all work is performed by interrupt service routines, responding to incoming messages and sending acknowledgements. The exceptions are line inputs and events in the bounce mode (Asynchronous I/O). Messaging is via the IOC interface. The only message recognized after initialization is the QUERY MPC STATUS. Subsequent messages received are processed according to their ing to their function. Unsolicited command messages (Bounce Mode Input and Events) are sent when appropriate.

ROM maintenance execution is controlled by a state machine. Each as shown in Figure 4. Each incoming message is processed incoming message is processed and acknowledged with a response. All functions except the maintenance test are performed immediately. The results are reflected in the return code or, in some cases, in the data of the response message. For the maintenance test an immediate response is sent. When the test is completed, the results are queried by the QMTEST command. For input sent in the bounce test mode, an unsolicited command is sent containing the input data as a delayed response to the Issue prompt command.

ROM maintenance is exited in one of two ways:

1. When a "start application" message is recieved, the down-

loaded application is executed.

2. If a "break" is detected from the asynchronous port, Doodlebug is entered. A "break" condition will only be recognized after a sequence of characters is entered. This is to prevent an end-user from causing the MPC to enter Doodlebug. This sequence is "1X89AA".

Maintenance messages are part of CMC messaging. Messages received are ignored if any of the following is true:

1. Task ID not '000'B
2. Function number undefined
3. Message is not a command

If the message sequence number does not match what is expected, the message is echoed as a response with the appropriate return code and not. If ROM Maintenance is not in an acceptable state for the function of the message, the message is echoed as a response with the "Not Appropriate" return code. Listed below is a description of each message. An explanation of the message command and response is given.

The MPC ROM Maintenance and CC Loader is software that provides download and initialization control for application software and on board hardware diagnostics. This software includes:

A set of commands for low-level debugging

Initialization and exception vector processing

A set of commands that the CC issues to the MPC through the IOC to query the status of the MPC, perform diagnostics, and download and initiate the execution of software.

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Package	NTX001AA21 COMMON BASIC
Feature set	TRANSLATION AND SIGNALLING
Feature	DTMF OUTPULSING ON DTCS WITHOUT SENDERS
Feature no	F3842

FEATURE SYNOPSIS

This feature provides capability to outpulse DTMF digits on DTC trunks without attaching senders. DTMF tones are available on DTC's. This feature is applicable only on DTC trunks, other TRKS will still use senders.

FEATURE DESCRIPTION

This feature will enable trunk circuits on DTC's, RSC's and LTC's to outpulse in DTMC without having to attach (and then detach) a sender as the DTC is capable of generating DTMF digits.

DTMF trunks on other types of peripherals will still have to attach (and detach) senders (NT3X68AD).

This will allow for real-time savings when a trunk using DTMF is on one of those peripherals because the call process will not have to request a sender (and possibly wait for it), make the connection, release the sender and peg the sender OM's. As DTMF senders will not have to be provisioned for those trunks, this reduces the datafill, maintenance costs and hardware costs.

The internal connections will be the same as for an MF trunks. This implies that there will be a lower usage of network connections.

This feature will NOT provide for DTMF outpulsing without sender on IBN lines located on a LGC, an SCM or an LTC.

Ref: FDOC BC1295

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	LM TAKEOVER/TAKE BACK DIAGNOSTIC
Feature no	F3865

FEATURE SYNOPSIS

This feature provides a routine diagnostic to be performed during periods of low traffic to exercise the takeover/takeback procedure for the LM and RLM.

FEATURE DESCRIPTION

The feature is controlled by an office parameter in table OFCVAR which is modifiable using table control. Parameters are available to control the following:

- feature enable, defaults to disabled
- feature start time, defaults to 1 a.m.
- feature stop time, defaults to 3 a.m.
- number of failed units limit, default 2.

The exercise tests the LMs/RLMs one at a time until the failed units exceed the limit or the stop time is reached.

The diagnostic performs the following tests:

1. In service test of both bays:

The in service test will test the function of the LM/RLM controller cards, the ringing generators, the access to each equipped line by the bay, and the access to the secondary bus interface in each equipped of the bay by its mate. If the bay is a RLM bay, the HDLC control will also switch to the standby C-side message link to check that it works. If either bay fails the tests, a `lcdrex_failed` flag in `lm_node_status` for both the bay and its mate will be set, a `lmrex fail` log for the bay will be generated, and the routine exercise tests will be terminated.

If `lcdrex_enable` is off, the in service tests will only be run for the bay under test, and the tests will be terminated after this step. In that case, the result of this step will determine what `lcdrex_failed` flag is set to for this bay, and whether the `lmrex fail` log will be generated.

2. System-busy the bay with warm takeover by its mate:

The control of all the line_cards in the bay will be passed to its mate. If the takeover fails, a cold takeover will take place, the lcdrex_failed flags for both bays will be set, and a lmrex fail log for the bay will be generated. The routine exercise then proceeds with the next step, regardless of whether this step passed or failed.

NOTE: Some or all calls connected to the bay under test may be dropped during this step, and all calls will definitely be dropped if the warm takeover fails and results in a cold takeover.

3. In service test of the mate:

This will test the lines in all the bay's drawers to make sure they can be served by its mate, test the ringing generator serving it in both possible ringing generator configurations more completely than is done during the node audits, and perform a tone test on the test line in the bay to make sure that dial tone can be supplied to the bay by its mate. If this step fails, the lcdrex_failed flags for both bays will be set, and a lmrex fail log for the bay will be generated. The routine exercise then proceeds with the next step, regardless of whether this step passed or failed.

4. Return the bay to service with warm takeback:

The control of the lines in the bay will be returned to the bay. If the takeback is successful and all the previous steps have passed, the lcdrex_failed flag for the bay will be reset, and the routine exercise tests are then complete. If the takeback fails, the bay will be made system-busy again, the lcdrex_failed flags for both bays will be set, a lmrex fail log for the bay will be generated, and the routine exercise tests are terminated.

NOTE: Some or all calls connected to the bay under test may be dropped during this step.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	K AND S DSM INTEGRATION
Feature no	F3866

FEATURE SYNOPSIS

This feature provides the support to allow for the K&S DSM integration with the new DCM MTCE software.

FEATURE DESCRIPTION

This feature provides the mechanism to enable any required changes to common maintenance code, thereby enabling the integration of the DSM, the K&S version of the DCM, into the common single stream development of DMS-100 maintenance software.

Ref: FDOC BC1169

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	PM TO FACILITY MAINTENANCE IMPROVEMENTS
Feature no	F3879

FEATURE SYNOPSIS

This feature reduces the time taken to busy and return to service a peripheral and applies to both lines and trunks.

FEATURE DESCRIPTION

The feature reduces the time of busying and returning to service each terminal i.e. trunk or line. Hence the overall time of busying or RTSing the peripheral is reduced. The feature also reduces the impact on call processing of the peripheral maintenance actions.

TRUNKS

For trunks the maintenance time to busy each trunk is cut by approximately a factor of 10. (N.B. this factor is CPU time, not elapsed time. The ratio of CPU time to elapsed time increases with the priority of the process.) This reduction is achieved by (1) not calculating the trunk alarm level after each trunk is busied, (2) stop the terminal using messaging resources it does not need or use.

By not calculating the alarm levels for each trunk as it is busied, this will eliminate the constant updating of the alarms in the map display. Instead, the new alarm levels will be calculated and the levels displayed once, after all trunks have been busied and all the alarm levels have been recalculated. For RTSing each trunk, the duration is cut by approximately 50 percent. This is achieved by not calculating the trunk alarm level after each trunk is RTSed. In the RTSing case, the terminal must be allowed the messaging resources as a message must be sent to the trunk to RTS it.

The PM RTS does not impact call processing, hence no further reductions shall be implemented in the near future. For the PM Busy, it is necessary to reduce the impact on call processing. This is achieved by creating a table containing the status of all the nodes. The table is maintained by the node maintenance code. The net effect for call processing will be that it can determine (by reading the table) immediately after selecting a terminating agent whether that agent is in fact on a peripheral which has been busied out. In this case, another terminating agent can be selected.

LINES

The reductions currently possible in the Busy/Return to Service times for lines is minimal.

The reduction in impact to line call processing will be handled similar to trunks. Line call processing will check the node status table for the status of a peripheral before attempting to terminate on an agent on said peripheral.

Ref: FDOC BC1422

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	PM MAINTENANCE ENHANCEMENTS
Feature no	F3895

FEATURE SYNOPSIS

This feature provides:

- a) Improved robustness of XPM and LCM maintenance.
- b) Overload controls for XPM.
- c) Real time enhancements in the XPM.

FEATURE DESCRIPTION

a) Improved Robustness of XPM and LCM Maintenance

This feature focuses on some of the weaker areas of NPM and LCM maintenance and provides more efficient routines to enhance the robustness of the peripheral maintenance processes.

The specific items are:

- the RTS sequence of an XPM
- the BSY sequence of an XPM
- providing ringing generator optionality for LCMs (CC only)
- the control of parallel tasks on the units of an LCM
- control over the reporting of XPM exception reports.

b) Overload Controls for XPM

This feature provides improved handling of line call processing in the LTC under overload conditions. This overload control mechanism is an initial step to incorporate a more long term solution.

The control is broken into two parts:

1. Terminal Processing Task (TPT) queue restructure to maintain a steady grade of service under overload.
2. Methods to shed new originations when in overload.

c) Real-time Enhancements in XPM

The following list of items are areas where real time enhancements have been made in XPM call processing code. Most of these items directly af-

fect line call processing but generally will have an impact on AB trunk and CCIS call processing.

1. Optimize calls to procedure LOCATE_CHB:

In all call processing except p-phone, procedure LOCATE_CHB does not have to be called because there is at most only one CHB linked to the terminal.

2. Final tidy up of SERVER/TPT task merge and data structures cleanup:

This breaks down into three areas:

- a) MDB, server record merge and server record optimization
- b) Procedural interface for line terminal event reporting
- c) Optimize parameter passing

3. New interface for periodic signal and AB trunk signalling:

This should improve tones like busy and reorder as well as AB trunk wink timings under load.

4. Streamline TPTDRIVE code:

This code is invoked on every message into the TPT. Any savings here are gained for all call types.

5. Remove unnecessary messaging from KILLFCN processing.

6. Global review of any tidy up of call processing code:

This includes standardization of procedures and naming conventions for data structure manipulation as well as using the enhanced data structures.

Software Package - NTX001AA

Ref: FDOC's BC1433, BF0611, BF0612

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	CC BOOT LOADER FIRMWARE ENHANCEMENT
Feature no	F3960

FEATURE SYNOPSIS

The CC boot loader firmware is enhanced to support the new 1MW circuit pack and the 16MW controller circuit pack. In addition, memory fault location and spare switch-in are supported. The capability to run memory tests by manual initiation via the processor maintenance circuit pack is added.

FEATURE DESCRIPTION

The enhanced boot loading procedure provides the following features:

- the processor is able to switch-in a spare memory block on a memory shelf if a fault is encountered during boot loading. This prevents the boot load procedures from being terminated by a memory fault. The feature only provides spare switching for one bad block per shelf. A second fault will suspend boot loading and display the error code on the front panel hex display.
- changes are made to the bad card location and switching firmware to support the NT4X80 1MW memory card and the NT4X79 16MW memory controller.
- changes are made to support 1MW, 2MW and 8MW sizes of program store. The ability to differentiate the three store sizes and calculate the resulting maintenance addresses is provided.
- boot loading progress indication is given to switched with the remote maintenance an control option. Progress codes are generated at each major event of the boot loading procedure.

The thumbwheel memory test allows testing of all or part of data and program stores without the need for switch software to be running. The test is controlled via the thumbwheels on the face plate of the NT1X48 pack. The test allows the user to designate all or 1MW blocks of store for testing. Blocks are selected by inputting the desired block # (0-F for datastore, 0-7 for program store) after test selection. Test progress and results are given via the hex display.

Please reference FDOC BF0568 FN for detailed description of test operation.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	CALL PROCESSING ROBUSTNESS
Feature no	F3962

FEATURE SYNOPSIS

This feature implements enhancements to call processing audits for robustness. Counters implemented on a per call basis detect and kill misbehaved calls, audits of receivers prevent resource hogging.

FEATURE DESCRIPTION

A counter is added to track the number of calls in the process of being cleaned-up following a call death. This counter is used in combination with existing call processing resource counters to ensure sufficient call processing capacity to handle originations and progress messages following several call deaths.

A new receiver audit is required to recover hung receivers at times of high load. The new audit checks receiver tables against the CCB to which it is linked. If the CCB indicates the receiver is not linked, the receiver is recovered. The audit runs each 2 seconds and swaps out after 2 ticks.

Counters are implemented, incremented within the clock interrupt handler, for each CALLP with a linked CCB that is running at the time of the interrupt. At the time of the increment the counter value is compared with the maximum number allowed resulting from the office parameter 'CCB_CPU_LIMIT_PERCENTAGE'. The call process of a call that exceeds this parameter is killed. To prevent incorrect operation for long duration calls (e.g. attendant consoles) the counters are zeroed each minute.

Ref FDOC BC1517

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	CLLI ENHANCMENTS BCS APPL SPEEDUP
Feature no	F3964

FEATURE DESCRIPTION

This feature makes the Common Language Location Identifier (CLLI) name symbol type countable. This allows the capabilities of BC1162, Data Dictionary Type Usage Count, apply to this symbol type. As a result, data corruption resulting from deletion of the referenced data when accessed from multiple sources is minimized.

In addition, a CLLIMITCE tuple which contains default tuple values is added/deleted to/from the CLLIMITCE table whenever a CLLI tuple is created or deleted.

Reference FDOC BC1162, BC1490

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	PERIPHERAL STATUS CHECK REPORT BEFORE SWACT
Feature no	F3965

FEATURE SYNOPSIS

This feature is a continuation of the improved BCS application project. Various enhancements are provided in response to feedbacks from VO test sites and BCS 'applicators'.

FEATURE DESCRIPTION

The following improvements are combined in this feature:

- the status message resulting from the RESTARTSWCT command to report nodes that are not in a suitable state for warm swact is improved to include the device name as well as the node number.
- the capability to provide the device sanity checks within the warm swact process is made available through a CI command STATUSCHECK.
- the feature provides a break down of SWCTTIME by addition of extra time stamps within the warm swact process. Timing capability is enhanced from total swact time as follows:
 1. Time on BCSn side + restart on BCSn+ side
 2. Time on BCSn+ side up to but not including exec loading
 3. Exec loading old pms
 4. Exec loading new pms
 5. Time on BCSn+ side after exec loading.
- the new RESTOREX ECS command is a partial replacement for the LOADEX ECS command. This command is used to load execs to any or all pm types present. Functionally, if a pm type is selected (for example TM) then the bound in procedure for exec loading of TM nodes will be invoked. If all pms are selected, then a scan is made over node types and if an exec loading proc exists for that node type, then it is invoked.
- the LOADEX ECS command is now used to enable/disable or query exec loading over a warm swact. See MMI section for details.
- finally two new log reports are added to the SWNR log type. These indicate success/failure of exec loading to NPMS.

Reference FDOC BC1501

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	TERMINAL TYPES EXTENSION
Feature no	F5432

FEATURE SYNOPSIS

As the number of different new peripherals increases, more and more new terminal types are required to handle call processing to these nodes. The current maximum defineable number of terminal types of 16 has been reached. This feature increases the size of this table to accomodate 64 terminal types.

FEATURE DESCRIPTION

Current download of static data from the Central Control (CC) to the LTC contains information for this terminal type table. However, the terminal types are packed in a 4 bit field; thus each byte contains two terminal types. Due to the expansion of the terminal type field from 4 to 8 bits, the CC will now send only one terminal type per byte.

Due to backward compatibility, a new table containing the new format will be shipped down to the peripheral.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	FILE SYSTEM DEVICES INCREASED
Feature no	F5436

FEATURE SYNOPSIS

The purpose of this feature is to increase the limit of maximum number of device types from 15 to 3.

FEATURE DESCRIPTION

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Package	NTX001AA21 COMMON BASIC
Feature set	FACILITIES
Feature	CPU CAPACITY ENHANCEMENT (40 MHZ CPU)
Feature no	F5449

FEATURE SYNOPSIS

Increase DMS-100 call processing capacity by changing CPU clock to 40 mhz from 36 mhz. Achieved by the substitution of numerous pin compatible faster IC on the NT1X43 through NT1X48 circuit packs. Clock interrupt timer to remain at present period.

FEATURE DESCRIPTION

The 40 mhz central processing unit (CPU) is a capacity improvement option for 3X41 CPU shelves that has been achieved by:

- increasing the CPU clock from 36 mhz to 40 mhz
- substituting pin-compatible faster devices for slower devices
- redesigning critical logic and timing areas

However, the period of the software interrupt clock which is used by the DMS switch operating system (SOS) to define a process time slice has remained at 6.25 milliseconds.

The purpose of this feature is to provide the necessary central control (CC) maintenance software support for the 40 mhz CPU enhancement.

The 40 mhz CPU option is largely software independent but for minor diagnostic support required in CC maintenance. Software changes will be confined to the CC routine exercise (Rextst). This diagnostic is run daily by the system to diagnose CC hardware and can be run manually from the CC level of the maintenance and administration position (MAP).

The 40 mhz CPU option should produce a 10 percent improvement in the performance of DMS offices. In effect, a DMS with this option can execute 10 percent more instructions in a time slice than DMSs without this option. The software introduced by this feature does not reduce this improvement in any way.

References:

FDOC BC1518

NTP-297-1001-101

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OM TRANSFER SPEEDUP
Feature no	F5500

OM TRANSFER SPEEDUP (F5500/BC1735)FEATURE SYNOPSIS

This feature will reduce the amount of real time required to complete the transfer of the OM data in the active registers to the holding registers.

FEATURE DESCRIPTION

This feature will alter the method of transferring the data in the active registers to the holding registers. This will reduce the amount of real time required to complete the OM transfer process.

The OM transfer process is the process whereby the active registers (the registers actually being pegged by the cc software) are copied into the holding registers (the registers used for output purposes) and then zeroed to start accumulation for the next time period.

At present the OM transfer process copies the data from the active registers to the holding registers tuple by tuple (or column by column for the two level descriptors) and then zeroes the active registers. This feature will speedup the transfer process by making the OM transfer process more efficient. The transfer for the single level descriptors is already quite fast. However, in the case of two level descriptors the process can be improved by swapping the top level descriptors and then zeroing the new active registers.

A non-protected data structure is implemented for the new active and holding registers as they will be updated at every OM transfer period.

At the transfer time, on a per group basis for all two level descriptors the values of the new registers will be swapped. Thus the 'old' holding becomes the new active. The 'new' active registers will be zeroed. Finally the post transfer procedure for the group will be run. The transfer of active to holding will be run unpreemptable for each group. This will remove all inaccuracies associated with the transfer process.

For single level descriptors the active registers will overwrite the holding registers and then the active registers are zeroed. This will be done locked on a per group basis.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	IMPROVED AMA TIMING COMPENSATION
Feature no	F5577

FEATURE SYNOPSIS

Various compensations must be made to the elapsed times of calls before they are recorded by automatic message accounting (AMA). These compensations deal with filter times, minimum charge duration (MCD), timed release disconnect (TRD) and flash timing. This feature enhances the accuracy of the filter and MCD compensation while reducing the time it takes to make them.

FEATURE DESCRIPTION

The basic piece of information used in calculating the duration of a call for AMA is the elapsed time reported by a peripheral when the call is taken down. Before this time can be recorded by AMA, it must be adjusted to take into account two types of compensations: those that are fixed for all calls of a given type (eg, line to line, trunk to line, etc), and those that vary because they depend on characteristics of a line involved in the call or who disconnects first. MCD and filter times fall in the first category while TRD and flash timing belong in the second.

This feature addresses compensations that are fixed by the call type ie, MCD and filter times. For filter timing the single worst case value has been replaced by a specific value for each type of call. MCD compensations are improved by simplifying the logic which decides whether or not MCD timing applies for a given call. This reduces the time it takes to make these adjustments.

Ref:

LSSGR Section 8.1 (Billing)

BC1403 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	NETWORK
Feature	ENABLE GAINS ON CLSI NETWORK
Feature no	F5655

FEATURE SYNOPSIS

This feature provides software support for per channel digital gain in DSN Network.

FEATURE DESCRIPTION

Presently the 5X13, 7X27 and 8X11 network modules have the facility for digital loss pads on a per channel basis on their B-side crosspoint cards. Recently a new variation of the 5X13 network has been developed to allow for per channel digital gain pads on the A-side crosspoint cards. The network software already supports both gain and loss pads but the gain portion has been "turned off" until now.

This software feature will be to turn on the gain capability for the DSN network and the new version of the 5X13 (and 7X27) networks and provide some diagnostics for network paths using digital pads.

This feature covers the following area:

1. Handle network ODM for the new 5X13 and 7X27 PEC codes so that pad diagnostics can be gated.
2. Consolidation of network get and make connection utility procedures.
3. Modification of network get and make connection utility procedures.
4. Diagnostics to test the digital gain/loss of channels in a given network as part of the out of service network test.
5. Debug tools for lab testing of the feature.
6. Modification of existing utility procedures for network gain/loss pads.

Ref: BC1729

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	PM EXEC TABLE CONTROL RESTRICTIONS
Feature no	F5659

FEATURE SYNOPSIS

In order to rebustify PM inventory table control against human datafill error this feature will provide a utility which will verify the correctness of the exec lineup datafilled for a PM. These datafill errors may go unnoticed until field problems are encountered.

FEATURE DESCRIPTION

Several outages in the field may be directly attributed to incorrect exec lineup datafill. This feature will provide a utility which will verify the correctness of an exec lineup to be datafilled into a PM inventory table. This feature should be completely transparent to all Telcos except when an incorrect exec lineup is assigned in a PM inventory table.

In addition to the utility a manual override to the table control restrictions will be provided. This aspect of the feature will be provided to allow an override in the case that a special exec lineup must be created or changed to solve a field problem. This override is intended to be used by ETAS or under its supervision.

Ref: BC1821

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	FIXED TRUNK GROUP NUMBERING NOT OPTIONAL
Feature no	F5676

FEATURE SYNOPSIS

This feature provides for a new administrative number to be included with each trunk group Common Language Location Identifier (CLLI) for identification purposes, which will remain fixed over the life of the trunk group and will survive dumps and restores. Network Management interfaces will be modified to make use of this feature.

FEATURE DESCRIPTION

Trunk group identification via assignment of a CLLI associated number does not prevent the number being modified through system housekeeping after a dump/restore if operational changes were made prior to the dump/restore e.g., trunk group deletion. A significant implication is that all downstream processor databases that map numeric value to CLLI name must be re-aligned. To avoid this for certain applications an optional table TRKNAME was introduced to associate a CLLI name with a numeric value and retain that association through dumps/restarts. However, this is not used by Network management (Engineering and Administrative Data Acquisition System - EADAS), nor is there any guarantee that a given CLLI name would be allocated a number (since table TRKNAME requires separate datafill to table CLLI).

This feature therefore provides for modification of table CLLI to include a new field (ADNUM) which contains the unique administrative number to be associated with each trunk group. The number can range from 0 to 2047 and is customer assignable.

Table TRKNAME is retained as a read only table with updates automatically reflected from table CLLI.

Ref: FDOC BC1711

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	PATCH DOWNLOADING
Feature no	F5698

FEATURE SYNOPSIS

This feature provides a mechanism for reliable delivery of blocks of data over an unreliable communications channel between remote computers and DMS.

FEATURE DESCRIPTION

Current methods of inputting and filing download information provide limited error checking and depend on DMS editor.

This feature allows transfer of binary files and provides transmission error checking and error correction by implementing a communication protocol consisting of two layers:

Protocol layer provides a mechanism that ensures reliable delivery of data over asynchronous communications channel. This layer adds control information to each block of data sent. The receiving end uses this information to decide whether the data block should be re-transmitted.

Application layer functions in two modes: the interactive mode provides facilities to issue DMS commands from the remote end with error free transmission.

File transfer mode provides file transfer session between DMS and remote computer.

To invoke this module, the remote computer must run NTs communication system and emulate an ASCII terminal.

Ref:

DDOC BC1823

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	QUERY COMMAND ENHANCEMENTS
Feature no	F5699

FEATURE SYNOPSIS

This feature allows the user (captive office or VO) to find out, using query command, when a module was last modified.

FEATURE DESCRIPTION

Prior to this feature, in order to find out if a module had been replaced, the entire list of modules in the system had to be scanned and the appropriate bit (REPLACED etc) examined.

This feature keeps track of all modifications made to modules. The query command has been modified to print the time and date that a module was last reloaded, replaced, patched or source patched.

References:

BC1925 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	ROBUSTIFICATION OF LM/RLM MAINTENANCE
Feature no	F5701

FEATURE SYNOPSIS

This feature addresses existing LM/RLM PRS's as well as improvements to the LM REX test.

FEATURE DESCRIPTION

The following is a list of items which will be addressed by this feature:

1) LM REX Test Enhancement :

While running the LM REX test, metering information is lost, and some calls (e.g. console calls) cannot be saved. This feature will allow the users to exclude the out-of-service test portion of the LM REX test from individual LM in case that LM has any calls that are not stable 2-port calls or there is any calls up on that LM in order to preserve metering information. This is only applied for the scheduled daily test.

2) PRS - BA37099 :

When a network to DCMR link is busied out on both planes, the corresponding channels on the DCMR to RLM links will be marked busy, so that the channel selection procedure will not try to use those channels.

3) Maintenance Indication for LM/RLM :

While running any maintenance on LM/RLM, 2 new fields will be introduced as follows :-

- first field indicates whether maintenance is in progress.

- second field indicates the kind of maintenance action.

The following describes the maintenance action character strings that will appear on the second field, and its corresponding reasons :

- LM Problem : LM/RLM having problems.
- Activity Drop : LM/RLM drops activity.
- Status Change : State change on LM/RLM/links/ringing generator interface (RGI).
- System Busy : System busy LM/RLM.
- Audit : System audit.
- Tst : Test (inservice or out-of-service).
- REX : Routine exercise.
- Msg Overflow : Unsolicited messages overflow.
- Load : Downloading LM/RLM/EXEC/ESA.
- Bsy Force : Busy force.
- Warm Action : LM/RLM takeover/takeback.
- Hold Relay : Hold relay.

- 4) Modification on the LM takeover field :
During the LM takeover operation, the takeover field will indicate the LM is being taken over rather than indicating no takeover.

REFERENCE

FDOC BC2015

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	ROBUSTIFICATION OF CARRIER MAINTENANCE
Feature no	F5702

FEATURE SYNOPSIS

This feature moves carrier maintenance from the auxiliary processes to the main process for the following types of PM : DCM, DTC, LGC, LTC, LCM, RCC, IDTC, ILGC, ILTC.

FEATURE DESCRIPTION

Moving carrier maintenance to the main process will achieve the following:

- 1) Faster return to service of remote PMs after restart.
- 2) Availability of auxiliary process improved.
- 3) Unsolicited alarm messages not lost.

Ref: BC2016 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	ROBUSTIFICATION OF NETWORK MAINTENANCE
Feature no	F5704

FEATURE SYNOPSIS

This feature address Network Robustification, cleanup of PRS's and a general scrutiny design and testing of the functionality in this area.

FEATURE DESCRIPTION

This feature will address Network Robustification in a number of ways. The approach taken can be summarized as follows:

1. Improvements to the system response to error conditions detected by the switch.
2. Improvements to the Network logs and Netinteg level information.
3. Restructuring of the Central Control Network Maintenance Software.
4. Software support for a Hardware Network Simulator (LSC Network).

FDOC BC2018

Package NTX001AA21 COMMON BASIC
 Feature set MAINTENANCE
 Feature TRK RTS SPEED-UP PHASE I
 Feature no F5716

FEATURE SYNOPSIS

This feature optimizes the trunk state transition from Peripheral Module Busy (PMB) to Carrier Fail (CFL). This results in a faster digital trunk return to service (RTS) time after the RTS of a PM.

FEATURE DESCRIPTION

To reduce the time required for RTS all the trunks on a DTC after cold re-start the state of a trunk will depend on the state of the carrier.

The relationship between these states can be summarized in the following table:

PM STATE	CARRIER STATE	TRUNK STATE
SysB or MB	CBSy	PMB
INS	SysB	CFL
INS	INS	IDL

This optimization results from reduction of messaging to the trunk during the state of transition, and eliminating extra overhead inherent in the current method.

Ref: BF0938

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	NO-CALL - PROCESSING ALARM
Feature no	F5722

FEATURE SYNOPSIS

This feature provides an optional enhanced version of dead system alarm which is more sensitive and capable of detecting no call processing. (The existing regular version of dead system alarm detects a non-functional CC only.)

FEATURE DESCRIPTION

A new office parameter ENHANCED_DEAD_SYSTEM_ALARM in table OFCENG has been added. When set to NO, the existing regular dead system alarm is in effect. When set to YES, the enhanced version is in effect. Changing from one mode to the other requires no restart.

The regular dead system alarm (DSA) causes messages to be sent from CC into the office alarm unit (OAU). The OAU detects the presence or absence of these messages. If the messages are lost or the CC is unable to send these messages, the OAU raises the critical alarm.

The enhanced DSA is similar to the regular version except that the OAU makes calls to the CC. The OAU tries to make a call every 5 seconds.

If after 20 seconds the CC has not answered any of the calls, the OAU raises the critical alarm. The CC also counts the number of calls made by the OAU. If the CC has not received any calls from the OAU in 20 seconds, a critical no-call-processing alarm is raised in the EXT level of the MAP.

The enhanced version of the DSA may cause alarms to be raised even though it appears that the CC is functioning properly. This type of alarm occurs if call processing is unacceptably slow. If this occurs, a NCPALARM in the EXT level is raised.

The enhanced DSA causes the same audible and visual alarms to be raised as the existing regular DSA with the addition of a software alarm.

References:

BC2246 FDOC
NTP 297-1001-122 Alarm System Description
NTP 297-1001-517 External (EXT) Alarms

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION AND MAINTENANCE
Feature	LCM OVERLOAD CONTROL
Feature no	F5735

FEATURE SYNOPSIS

Overload controls provide a staged response to traffic peaks by allowing the LCM to finish work in progress by slowing down or rejecting incoming work until the peak has passed.

FEATURE DESCRIPTION

If the LCM cannot keep up with the arrival of new work or if it cannot communicate the messages it has processed while new work arrives, it runs out of data store. Each processor detects overload by monitoring the amount of data store available to queue work. Overload controls then react in stages by slowing down or rejecting new work until more store is available. The overload control stages are:

1. Inter unit communication - normally each processor sends a message from the update queue to its mate informing about the progress of call processing. Under overload the processor saves data store by not creating update messages for the mate. As a result calls in progress take priority over update messages.

2. Line scanning - this is the second stage of overload control. Under overload the processor stops scanning the bus interface card until more data store is available. This stops the incoming workload arriving in the LCM data store.

References:

BF0956 LCM Overload Controls

DMS-100 Family Peripheral Modules, NTP 297-1001-103

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	RLM SIGNAL PROCESSING STORE SAVING
Feature no	F5752

FEATURE SYNOPSIS

To provide an extra 80 bytes in RLM's signal processing area.

FEATURE DESCRIPTION

This feature is to recover as much storage as possible in the RLM SP firmware. This is necessary to provide room for the implementation of the ringing generator interrupt monitoring feature. The final savings is 107 bytes.

Ref: FDOC BF0792

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	AMA PRESERVATION OVER PERIPHERAL WARM SWACT
Feature no	F5755

FEATURE SYNOPSIS

This feature provides automatic message accounting (AMA) billing for all calls preserved over a peripheral warm activity switch (SWACT). The timing used is from the central control (CC).

FEATURE DESCRIPTION

Without AMA preservation feature, calls surviving a DTC (or LGC or LTC) warm swact are not billed, because the peripheral loses the start time of the call during the swact. The release call message reason for this situation is 'DEAD' as defined by feature F1234.

With AMA preservation feature, the CC recognizes 'DEAD' and uses CC timing to bill the call.

References

BC1717 FDOC
F1234 SWACT Peripheral Enhancement

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	ENHANCED DIRP FILE
Feature no	F5766

FEATURE SYNOPSIS

Enhanced DIRP (Device independent recording package) file clean up is introduced to improve DIRPs ability to choose the best volume to place the next file on. This ensures a more even disk volume utilization and minimizes erasures of processed files before they expire.

FEATURE DESCRIPTION

A volume is composed of files, file segs (512 kbytes of available space), and free space (less than file seg). Files can be processed, unprocessed, available, or not DIRPs. Those that are processed are either expired (passed minimum retention period) or non-expired. DIRP tries to maintain a minimum of 4 file segs per volume at all times. Prior to this feature DIRP defined available room as the number of file segs on a volume. This selection criterion created a potential for DIRP to favour a volume with more file segs but less expired files, thus often causing erasure of non-expired files, when expired files exist on another volume. Enhanced DIRP file clean up improves the volume selection process by expanding the selection criterion for best volume. DIRP now defines available room as the sum of file segs and old space (space used by expired files).

Ref:

NTP 297-1001-312 DIRP

BC1384 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	CPU DIAGNOSTIC IMPROVEMENTS
Feature no	F5870

FEATURE TITLE: CPU Diagnostic Improvements

FEATURE SYNOPSIS:

The Enhanced Inactive CPU Test Command, reduces possibility of mismatches while in sync due to ROM parity errors resulting from execution of certain OPCODES or handling interrupts, if ROM has faults. The test in active CPU diagnostics includes:

1. Micro code self tests
2. RAM tests, and
3. New ROM tests.

Tests are invoked by (1) the 'TST CPU' command, at the CC level of the MAP; (2) 'SYNC' operations prior to attempting to sync the machines, and (3) the CC maintenance procedure handling mismatches after the machines drop sync.

FEATURE DESCRIPTION:

The inactive CPU ROM tests to detect the ROM malfunctions, which are not detected by the existing CPU 'Micromaze' diagnostics. (The Micromaze is a series of CPU diagnostics which are designed to determine whether or not the CPU is capable of executing its program instructions. The Micromaze is run any time the CPU gets a manual reset, a mismatch interrupt or upon a software generated request from the active CPU.) The undetected ROM fault can result in outages by halting machine execution.

Fortunately, the ROM tests which check the ROM functioning, can be implemented in software and be executed by the inactive CPU.

Because the inactive CPU tests take place while the active and inactive machines are OUT OF SYNC, the new software tests will be capable of detecting these ROM errors before an attempt is made to sync the machines.

The inactive CPU ROM tests make use of the execution environment, ie, software procedures which usually are part of both the active and inactive side loads. (The active and inactive side loads are usually maintained the same, because of the objective to make the machines run in sync. The loads may differ to an extent normally accepted as correct, e.g., after dropping sync and loading nonresident programs or applying DSO patches.)

Whenever the TST CPU command with no further parameters is invoked, for example, the active CPU process determines the correctness of inactive

mate's execution environment, if the program store areas which make up this environment differ, the TST CPU command is aborted.

The 'MTCH PS' and 'COPY' commands may be used to eliminate differences between the active and inactive sides, or the 'ROM' option can be applied with no side effects provided that the other side does not contain another BCS image. The ROM option makes changes to the program store and RAM contents on the mate's side, i.e., a very small portion of program store is copied with no noticeable real time impact.

Ref: AL0043

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	MATCH COMMAND IMPROVEMENT
Feature no	F5871

FEATURE SYNOPSIS

The major function of this feature is to match Program Store (PS) on Active and Inactive Sides while out of SYNC, to determine which cards need to be copied, if any, before attempt is made to SYNC the machines.

FEATURE DESCRIPTION

The existing match command 'Mtch', invoked at the CC level of the maintenance and administration position (MAP), is modified to match all store, for all modules and cards, not just allocated store as it used to.

The new and most significant Mtch command function is to match PS on the active and inactive sides while out of sync, to save time on unnecessary copying of PS after two machines drop sync. While out of sync, active and inactive sides concurrently calculate and compare checksums for each module and card. If the PS contents differ, the user is provided with a list of cards to be copied. Then, after the indicated cards are copied, an attempt to sync can be made.

The mtch command applied to data store (DS) while out of sync will result in checking of all DS for parity errors on the active side only (not just allocated DS as it used to).

While in sync, all PS and DS will be checked for mismatches.

Ref: FDOC AL0045

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OUTAGE FOOTPRINT FACILITY
Feature no	F5872

FEATURE SYNOPSIS

This feature is intended to aid on those outages where in the past little or no information could be obtained (outages where several restarts occurred, and mismatches were lost), allowing for a quicker resolution.

FEATURE DESCRIPTION

On an ongoing basis the SYSLOG facility will record information that may prove useful if an outage occurs. Information that may be useful are traps, mismatches, CC SWACTS, etc.

When the switch obtains sanity after a restart, and if the switch is out of sync, the inactive syslog buffers are copied to the active side. This can be useful when activity switch restarts occur. The inactive side's active syslog buffer and the first system restart buffer that occurred in the last 5 hours will be recorded. If there was no system restart the most recent completed restart is taken.

Ref: FDOC AL0046

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	BABBLING IDIOT ENHANCEMENTS
Feature no	F5873

FEATURE SYNOPSIS

This feature provides improved detection and handling of babbling nodes. The following enhancements are made:

Three levels of babbling thresholds per node type.

- Better detection mechanism for low rate babblers.
- IO (input/output) node aspect for babbling node maintenance.
- Capability to handle multiple babblers.

FEATURE DESCRIPTION

A babbling node is any device that sends interrupt messages to the central control (CC) at an excessively high rate. For most of the nodes in DMS, it is 2500 interrupts in 9.2 seconds. If left alone, it can have serious effect on a switch.

Corrective action needs to be taken to remove the babbling node and restore normal processing. Current strategy, however, has some deficiencies:

- 1) Babbling threshold of 2500 is too high. Lower rate babblers will never exceed it.
- 2) Corrective action on detection of a babbling node is to shut down scanning on both of the central message controller (CMC) ports. This will cause the input output controller (IOC) or network to go out of service.
- 3) Multiple babblers cannot be detected.

To correct these problems, the following enhancements are made:

- 1) Three levels of babbling thresholds (LOW, MEDIUM, HIGH) to account for varying rates of babblers.
- 2) A new IO node aspect that will allow babbling nodes to be taken out of service as they occur, without affecting the entire network or IOC. This also allows the detection of multiple babblers in the same time frame.

Ref: FDOC AL0047

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	LCM DRAWER MAINTENANCE
Feature no	F5907

FEATURE SYNOPSIS

This feature will provide support to prevent LCM takeover from occurring when LCM drawer faults are detected by LCM diagnostics.

FEATURE DESCRIPTION

Drawer faults are detected by the LCM self test diagnostics which are then reported to the CC. A self test fail log is subsequently dumped indicating which test failed followed by a card list. The CC then invokes further FULL in-service diagnostics to ensure that the fault is not transient. If any one of the following DCC/BIC related tests failed the self test diagnostic and the FULL in-service diagnostic, the LCM would previously have been driven into takeover.

- BIC looparound
- BIC Scan
- DCC Looparound
- DCC-BIC Looparound

Since the BIC card is not a duplicated piece of hardware, faults which occur on a drawer will affect call processing service equally no matter which unit is inservice and controlling that drawer. It is the intent of this feature then to prevent takeover from occurring if a BIC (drawer) fault is detected. Since all of the above listed tests exercise various hardware in the DCC it must first be determined that the fault does not actually lie in the DCC for which takeover is justified. Due to the ambiguity of where the fault actually resided, takeover has previously been the preferred maintenance action when drawer faults were detected.

In the new design, if takeover occurs as a result of a reported drawer fault, then the DCC has been determined to be at fault even though the LCM has failed BIC diagnostics.

Valid drawer faults will not take an LCM unit out of service however the appropriate ISTB condition will be raised against that unit. The ISTB reason will be either Self test or Diag fail depending upon which diagnostic failed causing the ISTB condition to be set.

FDOC BF0957

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	SPEEDUP C1 DIRECTORIES
Feature no	F5916

FEATURE SYNOPSIS

The intent of this feature is to reduce the time required to add a command to a CI directory. This will result in improved terminal response time and reduced restart time.

FEATURE DESCRIPTION

There are 2 primitives ADDCOMMAND and ADDCIBINCOM used to make commands known to the command interpreter (CI).

ADDCOMMAND is used by applications, while ADDCIBINCOM is used only by SOS for adding system commands during restarts. After analysing these primitives by using callct, it was evident that there was room for improvement.

All applications which add commands to CI directories, will now have improved entry and restart times.

Ref: FDOC BC1486

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	IMPROVE SWITCH ROBUSTNESS AGAINST RAM ERRORS
Feature no	F5924

FEATURE SYNOPSIS

This feature improves switch robustness against RAM errors by providing coverage of RAM that is similar to the coverage currently being given to data store. This improved coverage will be provided by RAM diagnostics and new mismatch and trap strategies.

FEATURE DESCRIPTION

Corrupted values in the RAM STACK can result in many critical addresses being corrupted causing branches to unexpected locations. These bad branches can result in dropping sync, traps and restarts/ reloads. Errors in RAM can cause mismatches (when in sync) and traps (when out of sync). By enhancing the actions taken on these occasions, the effects on the switch can be lessened.

To prevent these problems and to correct them before they occur, the following solutions are implemented.

1. Read RAM before syncing. This detects parity errors when a location is read that has a parity error the process will trap, and syncing with corrupt data is prevented.
2. Implement RAM checksums. This provides a means of determining which side is correct when a mismatch occurs.
3. Modify the TRAP handler such that RAM PARITY traps with the DATA store hold register (DAMR) = DS are ignored. This provides the ability to correct RAM parity errors before the RAM location is accessed.
4. Check all of RAM for errors when a mismatch occurs with no FIR (fault indication register) bits set.
5. Provide a RAM retention test. This ensures that RAM can maintain a value and that there are no hard faults. This is done as part of the TEST CPU procedure which is done as part of the sync command and the TST CPU command.

REF: FDOC AL0077

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	TRUNK RTS SPEED-UP - PHASE II
Feature no	F5928

FEATURE SYNOPSIS

This feature speeds up the trunk return to service (RTS) process by streamlining the means by which office data is sent to peripherals.

FEATURE DESCRIPTION

A set of office parameters known as "office data" are global to an office and should be sent to a peripheral module (PM) only when needed, either when the peripheral is being RTSed, or when a change is made to one of the office parameters. Previous to this feature, the office data was sent to the PM every time an individual trunk was RTSed. The reason for this was that it would be easy to update the office data in a given PM simply by RTSing one of the trunks on the PM. However, when an entire PM is being RTSed, the office data will have been sent down once for every trunk on that PM, as each individual trunk is RTSed. This feature eliminates the extra transmission of office data to a peripheral.

Instead of sending down the office data once per trunk, it is only sent down the first time any trunk on a given PM is RTSed, either after the PM is RTSed, or after one of the office parameters is changed. Any subsequent RTS of a trunk on that PM does not cause the office data to be sent. The result is a faster trunk RTS.

For the case when a PM is being RTSed, the trunks are RTSed by the system, and office data is sent automatically on the first trunk RTS. However, if one of the office data parameters is changed, the new office data is only sent to a PM when a trunk on that PM is normally busied and RTSed by a craftsperson.

Ref: FDOC BF0939

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	BABBLING LINE HANDLER
Feature no	F5931

FEATURE TITLE: Incoming Message Overload Handling for Lines

FEATURE SYNOPSIS:

The purpose of this feature is to revisit the handling of incoming message overload lines. The main points of the feature are:

- the establishment of a new line state system busy, SB, to indicate when the system has taken a line out of service.
- the auditing of the diagnostic process to ensure that it is always capable of diagnosing lines.
- revisiting incoming message overload lines that have been disabled with the intention that continuous incoming message overload lines stay disabled but, transient incoming message overload lines will be returned to service when they have ceased to become a problem.
- the establishment of a RECIDIVIST (repeat offender) queue. This will provide a record of the 128 most frequently heard from incoming message overload lines. Providing such a record is meant to highlight problem areas such as commissioning or cabling problems which are all symptomatic of incoming message overload lines.

FEATURE DESCRIPTION:

An InComing Message Overload LINE (ICMOLINE) is defined as a line which is reporting excessive on/off hook transitions. The definition of excessive on/off hook transitions is currently hardcoded into the LCM firmware.

ICMOLINES have the ability to degrade and take down an LCM if not detected and removed from service. This feature revisits the disabling and removing from service of detected ICMOLINES.

This feature can be broken down into three areas:

- 1) Handling of ICMOLINE reports
- 2) The ICMOLINE audit
- 3) Providing a record of frequently reported ICMOLINES.

Ref: AG0053

Package	NTX001AA21 COMMON BASIC
Feature set	SIGNALLING AND SUPERVISION
Feature	TRUNK SUPERVISION OVER DTC SWACT
Feature no	F5935

FEATURE SYNOPSIS

This feature enhances the idle and stable call state synchronization messages for trunks sent from the active unit of the DTC to the inactive unit.

FEATURE DESCRIPTION

With this feature a single short message is sent to the inactive unit of the DTC from the active unit when a trunk resumes idle state. Prior to this feature two long messages were used. Data not transmitted is recreated in the idle unit.

This results in a reduction in the time required to assemble and deliver each message, leading to better call synchronization between active and inactive units and an improvement in the number of calls dropped during DTC warm SWACT.

Call start time is included in the stable call synchronization message sent from the active unit for each trunk in stable talking state. This will allow accurate call times to be maintained across warm SWACTs. Future CC software could made use of this more accurate call line data.

Ref: BC2330

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	ENHANCED LCM OVERLOAD CONTROLS
Feature no	F5936

FEATURE SYNOPSIS

This feature enhances overload controls in the LCM. LGC applies flow controls to LCMS and thus helps the LCMS to maintain throughput under overload.

FEATURE DESCRIPTION

The processors of the LCM have two resources: real time and data store. To spread the load over a longer period, the LCM queues work to be done in data store. If the LCM cannot keep up with the arrival of new work, or if it cannot communicate work it has finished, it runs out of data store to queue new work.

Overload controls were previously implemented (Ref 1) in the LCM. These controls were limited by two major deficiencies of the LCM: limited RAM address space and ignorance of the call processing state, LCM applies overload controls to originations, terminations and call in progress indiscriminately. Due to this indiscriminate nature of control, a constant throughput for all levels of overload cannot be maintained. As a result throughput decreases as overload increases.

In this feature LCMS report their load states to the LGC. The LGC decides which LCMS are overloaded and accordingly applies flows controls to origination messages for those LCMS. By applying selective controls LGC thus helps the LCMS to maintain throughput. LGC flow controls provide the following capabilities:

- 1) Origination flow control
- 2) Guaranteed dial tone
- 3) Per terminal queuing, and
- 4) LIFO queuing of originations

which are beyond the capacity of the LCM.

Ref: FDOC BF0956, FDOC BF0706, FDOC BF0958, FDOC AL0049

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	PM AUTOLOADING PHASE I
Feature no	F5953

FEATURE SYNOPSIS

This feature will reduce the elapsed and real time required to load an XPM unit under heavy traffic. Improve robustness of LDPMALL command to reduce system recovery time.

FEATURE DESCRIPTION

This feature will reduce the elapsed and the total CPU time required to load peripheral modules.

The total CPU time required to load a peripheral module will be reduced by approximately 18%. The elapsed time will be reduced by approximately 15% (or 40 seconds) under no call processing and approximately 28% (or 2:54 minutes) under 45% call processing.

REFERENCE

FDOC BC0806

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DIRP DISK ERASE FILE SECURITY ENHANCEMENT
Feature no	F6063

FEATURE SYNOPSIS

This feature implements a new command which renames "R" (Removed) DIRP (Device Independent Recording Package) disk files to "P" (Processed) DIRP disk files, thus returning previously unavailable files to DIRP for deletion as space is needed for recording. This command also deletes closed parallel files.

This feature also marks all DIRP FILESEGS as critical files.

FEATURE DESCRIPTION

A new DIRP level command CLEANUP is implemented by this feature. This command renames terminated "R" files to "P" files (an R file is terminated if its file date is earlier than or equal to the date supplied in the command line), so that they can be erased. CLEANUP command is also used on closed parallel disk files. They are erased immediately by this command. Independent of the CLEANUP command, this feature marks all DIRP FILESEGS as critical files. This will help prevent the user from inadvertently deleting DIRP FILESEGS and thus causing internal DIRP corruption.

Ref: NTP 297-1001-312 DIRP Reference Manual
BC1719 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	INCREASE THE NUMBER OF IO NODE TYPES
Feature no	F6084

FEATURE SYNOPSIS

The operating system for DMS-100 switch previously allowed a maximum of 32 node types. This has been constantly increasing, and exceeded the original intent of 32 types. Some of these node types were required for few hardware being developed. Other node types were required by new logical nodes being designed into the system. More node types were required in order to support the ever increasing DMS-100 software system.

FEATURE DESCRIPTION

The users of this feature are the DMS designers who design software which interfaces with the various nodes in the DMS system. The telco does not directly use this feature, but rather is the beneficiary as new peripheral modules are introduced.

The performance and the capacity of the DMS-100 switch does not change directly as a result of this feature. However, in the long run, the increase in node types will impact call carrying capacity by providing the ability to add new node types which can handle more calls. The operational sequence of DMS-100, the I/P and O/P requirements, the billing information, the logs information, telco date table information, service order information, and the operational measurement information do not change as a result of this feature. The data store required for tables that have one entry or tuple per node type does increase. The size of the static table, the allocated table, and the program store are approximately by 5350 words, 1800 words, and 250 bytes respectively.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	LOG SYSTEM INTERNAL CONTROL CLEANUP
Feature no	F6085

FEATURE SYNOPSIS

The purpose of this feature is to change the log system's internal process control mechanism so that the processes which write logs to physical devices can only be started or stopped by a single process, namely their daddy process.

FEATURE DESCRIPTION

This feature is being done to avoid situations where the daddy process misses messages sent to it and so is insurance that one of the processes writing logs had died, allow logs to resume automatically on a log device which momentarily became unavailable, and ensure that all primary log devices not explicitly stopped by a user are started on every restart, including BCS applications.

Examples:

LOGDEVP Process - each physical device (terminal, printer etc), has a process associated with it which writes logs to it. There may be a maximum of 32 log device processes existing at the same time.

LOGSLUI Process - this process is the 'daddy' process for the LOGDEVPS. It creates LOGDEVPS after a restart, and then monitors all of them, recreating any that it discovers have died. There is always only one LOGSLUI process.

CI Process - each DMS user gets his own CI process when he logs on, to allow him to execute various commands. Since there is one process per user, there may be many of these processes in the system. Since any user process may enter and use LOGUTIL commands to start and stop LOGDEVPS, every user process has the capability to start and stop any one of the up to 32 LOGDEVPS.

Ref: DDOC BC2312

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION AND MAINTENANCE
Feature	ALARMING ON DCM/RLM LINKS
Feature no	F6089

FEATURE SYNOPSIS

This feature provides the proper alarm indication for the status of the connection link between the peripheral modules DCM and RLM, and for the status of the link which connects an RLM to its mate.

FEATURE DESCRIPTION

The purpose of this feature is to enhance some aspects of the office alarm subsystem. Three major capabilities are provided as part of this enhancement:

1. Necessary alarm indication for the status of DCM/RLM links and links interconnecting an RLM pair;
2. Correction of deficiencies in the alarming mechanism for remote sites, and provisioning of full support for sites equipped with RLM's; and,
3. More flexibility and capabilities to the EXT MAP level, through the addition of a new CI command.

FDOC BC0724

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DIRP PROCESS REVIVAL
Feature no	F6092

FEATURE SYNOPSIS

This feature provides a command that will revive dead device independent recording package (DIRP) processes without requiring a system restart.

FEATURE DESCRIPTION

Dead DIRP processes can be revived with a new command REVIVE at DIRP level. While a process is being revived, the command waits up to one minute to learn the results of that attempt. If there are delays in processing the command and no results are received within that minute, the user is told to inspect logs later to learn the outcome.

All successful process revivals are logged in the DIRP101 log stream.

Ref: AF0149 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DIRP REALTIME ENHANCEMENTS
Feature no	F6093

FEATURE SYNOPSIS

This feature reduces the use of CPU real time by DIRP disk audit process DIRPDSON. The use of CPU real time is reduced in one or both of two ways: 1) by minimizing calls to CPU intensive disk utilities, and 2) by reducing scheduled runs of DIRPDSON from 5 minute audits to daily audits.

FEATURE DESCRIPTION

Prior to this feature the DIRP disk audit process DIRPDSON was running a 5 minute schedule and on demand from other DIRP software. BCS23 feature F6063 "DIRP DISK ERASE FILE SECURITY ENHANCEMENT" provided an environment in which the work done by DIRPDSON can be reduced. It did this by putting the erasure of DIRP disk files entirely under the control of DIRP itself. Now that DIRP was given this control, this feature (F6093) improves DIRPDSON disk audit process in two ways: 1) Its code for audit on demand is streamlined, and 2) It is run on a daily rather than a 5 minute schedule. Thus DIRPDSON runs less often and more efficiently.

DIRPTSON, the DIRP tape audit process, also moves from a 5 minute schedule to a daily one.

Ref: AF0150 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	NODE TYPE EXTENSION FOR NEW PERIPHERALS
Feature no	F6153

FEATURE TITLE: Node Type Extension for New Peripherals

FEATURE SYNOPSIS:

This feature increases the number of node types in the new peripherals from 32 to 64. The node types can be expanded to 256 in the future if required.

FEATURE DESCRIPTION:

Due to the development of new products, the number of node types allowable in the new peripherals has reached its maximum of 32 types. This feature will increase the node type to 64 and is transparent to the Telco.

Ref: AL0130
BC3211

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	PM AUTOLOADING - PHASE II
Feature no	F6154

FEATURE SYNOPSIS

This feature will provide general autoloader capability for the PM loader. XPM maintenance will be taking advantage of the above to provide auto reloads of XPMs requiring a new load. Dual plane loading will also be implemented for first level XPMs. This will reduce the load time of first level XPMs.

FEATURE DESCRIPTION

The LTC, RCC, MSB, IAC, and ESA node types will be providing PM autoloader.

1.1 XPM Autoloader Trigger:

A SYSB XPM that has failed 2 consecutive RTS attempts in a mode consistent with load corruption will be marked for auto load. Its sysb reason will be changed to "LOAD" and an auto load will be attempted if the required resources are available. An audit will re-attempt the auto load should the resources be unavailable.

1.2 Loading Loops:

Auto load will not be retried on XPM that have failed the ROM diag part of auto loading. This is to prevent futile loading loops. It is possible that some HW related problem will not be detected by the ROM DIAG, but may prevent successful loading, RTSing or sanity. Only 2 consecutive attempts at auto load will be permitted for XPM that fail to load, RTS, or remain in service for 10 minutes.

1.3 Load File Management:

A new table "PMLOAD" will be created to store a mapping between the load names and devices that the loads reside on. This will permit auto load to locate load files without craft intervention.

1.4 PMLOAD - XPM Inventory Table Interlock:

A load name will need to be entered in table PMLOADS before it is accepted as a load name in the XPM inventory tables.

All uses of a load name will need to be removed from the XPM inventory tables before it can be removed from PMLOADS table.

1.5 Office Alarms:

The Auto load feature will only be possible when the load files are stored in DISK.

A minor alarm will be raised if any PM load file data failed to be on a disk is not located there. The justification for this alarm is that the ability of MTC to recover PMs requiring reloads will be lost if the load file cannot be located.

The display in the PM slot for office alarms will be "PMLOAD" assuming that the above alarm is greater than any other PM alarm. By listing all the tuples in table PMLOADS, the craft will see a message for every file the system was unable to locate.

2. XPM Load Time:

Both message links to first level XPM units will be used when possible, to reduce load time. Load time will be reduced by approximately 30% of its original load time.

The improved loading rate for XPMs will further help reduce the outage time when an XPM requires reloading.

Ref: DDOC AL0131

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	LCM DRAWER MAINTENANCE - PHASE II
Feature no	F6155

FEATURE TITLE: LCM Drawer Mtce - Phase II

FEATURE SYNOPSIS:

This feature implements CC and LCM support for LCM drawer maintenances. Primary capability is to allow the system to effectively identify and remove a faulty drawer from service while not jeopardizing other call processing or LCM maintenance.

This feature provides maintenance for LCM drawers similar to other new peripheral maintenances.

FEATURE DESCRIPTION:

A new set of states are provided for each drawer listed below:

->In-service, the drawer is in-service and able to call process.

->I In-service trouble, drawer fault found, the drawer may still be able to call process on some lines but the LCM disables internal diagnostics on that drawer.

->S System-busy - Serious drawer fault detected, call processing not possible. The 32 lines on this logical drawer are busied with a line state LMB. These lines are no longer scanned for hook transitions. The LCM disables maintenance when a drawer is made SYSB.

->M Man-busy - Drawer has been busied out manually from the MAP. The effect on the drawer is equivalent to the system busy case.

->O Offline - The drawer has been offlined. No system maintenance will affect the drawer including any restart actions. A drawer can only be made offline if it is first in a man-busy state.

->Unequipped, the drawer is unoccupied and no lines are datafilled on that drawer.

Ref: F6155

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	TRUNK SUPERVISION OVER DTC SWACT
Feature no	F6156

FEATURE SYNOPSIS

This feature will send synchronization data for stable "AB" trunk calls to the inactive DTC unit. This data will allow these trunks to accept changes in supervision after a switch of activity with no disruption of service or intervention from the CC. The synchronization of stable "AB" trunk calls will also be supported on LTCs and RCCs.

FEATURE DESCRIPTION

1) Data Synchronization and Warm Swact

The DTC consists of two units connected by a high speed link (IMC - Intermediate communication link). The IMC is used by the active unit to inform its inactive in-service mate about activity changes on its terminals.

2) Current Synchronization of Stable Calls:

As a call reaches the stable state, the digital trunk is marked as requiring synchronization on the DTCs inactive unit. The synchronization software on the active unit gathers the relevant data and sends it to the inactive unit. The inactive unit unloads the data and uses it to set up its software data structures and hardware.

The final action of the inactive unit is to mark the trunk so that if a warm swact should occur, the call can be identified as having survived a switch of activity. This is required because the data that is transferred is sufficient to maintain only stable calls, not support supervision or any changes.

Should a warm swact occur, the trunk that is maintaining the stable call cannot release the call or respond to any new requests without being "reset" by the CC. The DTC will send the CC a message if any change in supervision is received or the end of the call is detected.

This message prompts the CC to reset the trunk so that it is ready to accept a new call. The message also informs the CC that call duration calculations, for billing purposes, must be done also in the CC.

3) Current Synchronization Differences for the RCC:

The RCC has no CSM resident hardware. Consequently, the host LTC must be notified of state changes for non-intraswitched trunks. This is accomplished by sending a message to the active LTC. The LTC warm swact mechanism will request the terminal be synchronized.

The synchronization software in the active LTC will gather the data relevant for remote trunk calls and send it to the inactive LTC. The inactive LTC will then unload the data and set up the necessary software and hardware to maintain a stable call.

CSM in the inactive LTC will be initiated so that should the LTC swact, the RCC will not accept any CSM changes. Any CSM changes following an LTC warm swact will result in the same action as described above for the DTC.

All portions, except CSM, of the DTC warm swact described above pertain to RCC warm swact as well.

4) Proposed Synchronization of Stable Calls:

The data transferred by the active unit will be altered to permit the inactive unit to completely synchronize a trunk maintaining a stable call. In the event of a warm swact, the CC need not "reset" the trunk.

The trunk will be able to accept changes in supervision and at the end of the call, the DTC will send the call duration and set the trunk in the correct state to accept new calls.

In addition, RCC trunk calls will be able to accept new supervision across a host LTC warm swact as well as an RCC warm swact.

Clarification must be made that this feature will only cover trunks. If a line is connected to a trunk on the same peripheral, the call cannot be resupervised. If the line is resupervised, the call will be taken down with a release call message, but the trunk will not be reset by the CC.

Ref: AG0079

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	TRUNK IDLE PRIMITIVE FOR DTCEX LINEUP
Feature no	F6158

FEATURE SYNOPSIS

This feature provides real time enhancements for trunks on XPM. These enhancements decrease the time required to RTS a trunk and to idle an active trunk.

Currently, the XPM performs a exec to idle a trunk. An exec is a sequence of actions which the XPM performs. The definitions for these execs are sent from the CC to the XPM when the XPM is returned to service. The exec to idle a trunk is relatively long and therefore slow. This feature speeds up this exec by providing a new sequence which performs the work of the exec. Since it is written in the XPM's native code, it is faster than the exec.

FEATURE DESCRIPTION

When a trunk is idled, the XPM begins scanning the trunk for an onhook and starts a timer for a duration specified by the exec. If the scan change is detected before the timer expires, the trunk enters the idle state and begins scanning for offhook. If the timer expires before the scan change is received, then the trunk enters the lock out state.

The new trunk idle primitive performs the actions required to scan the trunk for the onhook and to start the timer. It then handles the onhook scan change and the entry to the idle state.

If the timer expires while waiting for the onhook, the XPM will perform the same actions as before. An exec will be run to place the trunk into the lock out state.

Ref: AG0126

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	TABLE FOR DUMP/RESTORE OF LOGIN CONTROL DATA
Feature no	F6159

FEATURE SYNOPSIS

A table implementation to save time by dump/restoring terminal login control data at BCS application time. Two tables have been implemented to improve the BCS application process involving user data and control information by allowing this data to be dumped and restored. This will save using the PERMIT command and LOGINCONTROL command to explicitly re-enter the data in the new BCS.

FEATURE DESCRIPTION

This feature implements two tables, USERINF and LOGINCTRL.

- USERINF is made invisible to the telco. It will contain user's usernames and login information. It will only be visible at BCS application time, when it will be activated by adding its table to table CUSTAB, and is then deleted from CUSTAB afterwards. It should be datafilled before table CDCLOGON, and to be safe, after table TERMDEV. It will allow user data in the PERMIT command (except passwords) to be present after the restore.

- LOGINCTRL is made available to the telco. It is provided to enable the login control data to be dump/restored and will enable data to be preserved between BCSs. The telco is recommended to use the LOGINCTRL CI command to change this data. This table must be datafilled after table TERMDEV, since it is implemented as an extension to it. The data in this table consists of these user terminal attributes: TERMDIS, DISTIME, MAXLOGIN, MAXIDLE, MAXRETRY, DISABLON, FRCOURT, DIALBACK, DIALTYPE, NUMRINGS, AND NUMCALLS.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION AND MAINTENANCE
Feature	PREFCT TOOL
Feature no	F6189

FEATURE SYNOPSIS

This feature provides a new tool for tracking CPU usage percentages of preferred users.

FEATURE DESCRIPTION

At high call processing occupancy, terminal response times increase dramatically resulting in performance degradation of maintenance tasks. This is mainly due to the fact that background activities are forced to use their CPU time from the 8% minimum that the scheduler guarantees. At lower call processing occupancy, background processes get more CPU time not used by other processes.

Background activities are divided into two groups: guaranteed and non-guaranteed background activities. Guaranteed background processes get 4% of the CPU time at high call processing occupancies.

In order to maintain the guaranteed background terminal response times constant and independent of call processing rates, it is proposed to introduce a method of configuring field offices so that guaranteed background is assigned a certain percentage of the CPU time regardless of the call processing activity.

Hence the objective is to typify users by what work they do and how much CPU time they require. Once this data is obtained, it will then be possible to advise field offices as to what guaranteed background percentage to use in the configuration of their offices and what the resulting cost to their call processing capacity would be.

In order to get the data to categorize users, a new tool is needed and this tool will determine what commands are used, and how much CPU time they require. The data collected by this tool will be for users at a guaranteed terminal only.

Ref: BC1772 FDOC and BC2302 FDOC

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DEFERRED OM OUTPUT
Feature no	F6219

FEATURE SYNOPSIS

The purpose of this feature is to provide the capability to generate operational measurement register special reports (OMPRSPEC) from the OM data stored in the standard recording format (OMTAPE) on tape or disk. The reports produced would be in human-readable form.

FEATURE DESCRIPTION

This feature introduces six additional man-machine interface (MMI) commands by which means it is possible to produce OMPR reports in a comprehensible and human-readable form. The basic source for these reports is the OMTAPE formatted operational measurement data held on tape or disk.

The OMPRSPEC report resembles that of an actual OMPR log report except for certain minor differences. These include non-regeneration of the week, -date in the START and STOP times, and the practise of fields always being displayed in a fixed 4-column formation.

The feature has certain limitations in its implementation in that it enforces sequential access on the OM data file. Consequently reports must be generated in the order in which data is dumped onto tape or disk. Also the feature cannot reproduce total tuples nor does the OMACCKEY selection apply. When OMACCFLD is applied to select fields to be printed, it causes the OM group not to be recorded in OMTAPE format and consequently these groups are not available to OMPRSPEC for reporting. A further limitation arises from the use of OMTAPE SUPPRESSION ON is that the tuple numbers located in the key and information field records (K records) do not correspond to the real tuple numbers.

Ref: NTP 297-1001-320 OPERATIONAL MEASUREMENT REFERENCE MANUAL
DDOC AG0239

Package	NTX001AA21 COMMON BASIC
Feature set	CALL PROCESSING
Feature	ECCB IMPROVEMENTS
Feature no	F6233

FEATURE SYNOPSIS

This feature introduces a revision to the extended call condense block (ECCB) facility for use in call processing (CP) applications. The result will be an improvement in CP real time and increased CP data stability. The ECCB provides a faster means of accessing call data extension blocks (EXT) or similar data structures.

FEATURE DESCRIPTION

The per-call data required by call processing is accessed via a defined data structure known as a call condense block (CCB). Storing the data in this manner enables call processing to be interrupted on its flow, typically by a realtime break, without data corruption or process discontinuity.

Certain users require more per-call data than is provided for in a CCB. Prior to BCS-22 this was catered for by the concatenation of additional storage blocks to the CCB. The additional blocks were structurally divided into 3 equal 16-word areas which were refined by an application as required. The limitations of the ECCB data structure were that it could not support more than 3 concurrent users. Also, if only one application was required in a call, there were 32 words of store wasted. Furthermore, it placed an upper limit of 48 additional words on a call.

With this feature, the ECCB is changed to a structure which contains pointers. The ECCB becomes smaller in size whereas the application to which the ECCB points can be of any size.

There are two mutually exclusive methods of using the new ECCB structure. The first and most general use references the ECCB-contained pointers to application areas. Each of these areas can be independent and of differing size. Up to 4 concurrent applications can use the ECCB, though this can readily be increased merely by adding other pointers to the ECCB.

The second method of use provides a slightly faster access to the applications area by using a Datareg2 data register to point directly to the application area. With this method the ECCB use is limited to a single concurrent application.

The real time enhancement arising from the implementation of this feature, is the elimination of procedural calls to locate extension blocks, since the per call data is now referenced directly from the ECCB.

Ref: FDOC AL0195

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DEVICE INDEPENDENT SUPPORT FOR APPLICATION DATA TR
Feature no	F6237

FEATURE SYNOPSIS

This feature allows the data transferral package (XFER) to perform input/output (I/O) via specific devices without having to combine in all required drivers. Also convert to the new technique which initially supports MPC and DPC I/O.

FEATURE DESCRIPTION

This feature makes it possible for XFER to use either the MPC or the DPC I/O package. XFER now calls generic procedures to establish and perform data transferral functions. These procedures format the data for the communications package that is bound in and passes the requests to that particular I/O package.

1) Previous functionality: XFERs only means of communications were through DPC. XFER made requests directly from DPC.

2) Current functionality - XFER now issues generic requests for communications without any knowledge of which communications package is present. This feature makes it possible for XFER to use MPC as well as DPC.

3) Future functionality - in the future a new protocol is implemented it need merely provide the necessary tools and XFER will be able to use it.

Ref: AF0209

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OM OUTPUT ROBUSTNESS
Feature no	F6311

FEATURE SYNOPSIS

This feature will improve the robustness of operational measurement reports during periods of high call processing utilization by identifying that overwriting of OM data by subsequent scan data has occurred. The overwritten OM data will not be output, consequently all data contained in OM report outputs will be valid, though the report may be truncated.

FEATURE DESCRIPTION

Presently the integrity of operational measurement (OM) data is not guaranteed during periods of high call processing utilization. Consequently, it is possible for OM data of one scan to be overwritten by the OM data of a subsequent scan. The overwriting can occur either when data is held in the report registers awaiting output or when the data is in the accumulation registers during the accumulation period.

The implementation of this feature will identify that overwriting of OM data has occurred and will result in the output of:

REPORT ABORTED : DATA OVERWRITTEN

as an error message in place of the overwritten data.

All OM data output will be valid, although reports will be truncated when overwriting has occurred. OMs overwritten during the accumulation process will be indicated by an error message with no associated data output.

The improved robustness of OM reports (OMPRT) will also extend to OMSHOW and OMTAPE facilities. OMSHOW will display only valid data and OMTAPE will contain only valid data with an additional type 'Z' record after the last valid data record to indicate an incomplete report has occurred. The type 'Z' record will be used by OMPRDUMP to indicate that the report is incomplete.

This feature does not guarantee complete OM reports, only that data contained therein is valid. Other features and the provision of a dedicated OM printer will guarantee a higher completion rate for OM reports.

Ref: NTP 297-1001-114 DMS-100 Family Operational Measurements
NTP 297-1001-320 DMS-100 Family Operational Measurements Reference
Manual
FDOC AG0355, FDOC AL0205

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OMPRT OUTPUT BUFFERING
Feature no	F6312

FEATURE SYNOPSIS

This feature provides for optional buffering of Operational Measurement Printed Reports (OMPR), with the print out taking place during subsequent off-peak periods. The consequential result is an increase in CC efficiency during periods of peak load. The resilience of OMPR is also improved by this feature as buffered reports will survive WARM/COLD CC restarts as well as OMPR output device failure.

FEATURE DESCRIPTION

OMPRTs produced during periods of peak CC load are first saved in a disk buffer in a compressed format with the implementation of this feature. As scheduled by input parameters to the OMPRT table (OMPRT) and during periods of low CC load, the report to be printed is sent to a selected output device and not through the log system. The output device selected for OM printouts should be dedicated to OM printing and should not be a guaranteed terminal.

The order of printing OMs can be controlled through the use of table OMGRPORD resulting in OM printouts which reflect system configuration and improved readability. Reports can also be tagged with a filename for OM devices which can support files.

Buffering the OM reports results in increased resilience as the buffered OM data will survive WARM and COLD restarts by re-printing the interrupted report after the restart has been completed. Also, should the OM output device fail or be stopped for any reason, a log and minor alarm is raised. On clearing the problem or re-routing to another output device, reports can be resumed by manual intervention using special CI commands and no data loss will occur. If continuation does not occur for an extended period of time, the disk buffer will run until full and then all further reports will be reverted to the log system as in the unbuffered state again without loss of OM data.

Ref: DDOC AL0205, DDOC AG0355
NTP 297-1001-114 DMS-100 OPERATIONAL MEASUREMENTS
NTP 297-1001-320 DMS-100 OPERATIONAL MEASUREMENTS REFERENCE MANUAL

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	CC SUPPORT FOR DTU
Feature no	F6351

FEATURE SYNOPSIS

The feature will provide CC software support required to remove from service, test, and return to service the digital test unit (DTU) circuit from the trunk test position (TTP) MAP level.

FEATURE DESCRIPTION

The digital test unit (DTU), is a single line trunk card with PEC code 4X23AA. The firmware (M68000 micro program) controlling the DTU is downloadable by the central control (CC); each single physical DTU hardware has two trunk circuit appearances that can operate independently.

This feature will provide the CC software support required to busy, test and return to service a DTU circuit through the TTP MAP level.

This feature will not introduce any new command increment (CI) commands. It will make use of the existing commands (BSY/TST/RTS) from the TTP MAP level.

This feature does not require any application firmware resident within the DTU. All functions are performed by the bootstrap load. The bootstrap load is the default firmware load builds into the DTU's EPROM. If there is an application firmware resided within the DTU, all these functions (BSY/TST/RTS) will not corrupt the content of the application firmware.

Ref: AG0275

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	DTU F/W DOWNLOADER
Feature no	F6354

FEATURE SYNOPSIS

This feature will provide CC software support required to download the firmware to digital test unit (DTU) through a maintenance trunk module (MTM).

FEATURE DESCRIPTION

This feature will be activated by an existing CI hidden command "LOADFW" within the test trunk position (TTP) level of the MAP. This command, which is introduced in feature BC1259 (CC support for MTU downloading), will allow the user to perform the downloading the firmware to the DTU, and it can be invoked within all TTP MAP levels.

A filename option is provided in the LOADFW command to let the user to specify the filename of the firmware load. When activated, the load firmware software will extract DTU firmware from this given load file. In case no filename is given from the user, a datafilled default filename will be used. This filename will be datafilled in table OFCVAR as a new office parameter DTULDINFO. The implementation of the default filename will be developed in BCS-25.

A NOWAIT option is provided in the LOADFW command. When activated, the CI will not wait for the completion of the loading and new commands can be issued from the MAP after both logical DTUs have been put into one of the hold position.

A QUERY option is provided in the LOADFW command. When activated, the status of the firmware load for a particular DTU will be printed.

In case of not using the NOWAIT option, after the loading is finished, successful or not, a message will be printed onto the TTP MAP level indicating the result of the loading. In case of the NOWAIT option the status of the load can only be verified by using the QUERY option of the LOADFW command.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	HIGH WATER MARK OMS FOR CP,EXT,FTRQ
Feature no	F6402

FEATURE SYNOPSIS

Operational Measurements (OM) will be added by this feature to the CP2, EXT and FTRQ groups in order to measure the maximum number of central control software resources in simultaneous use. This will result in improved monitoring of the extent to which the resources in question are being utilized. Switch performance monitoring system (SPMS) indices will be produced from these measurements.

FEATURE DESCRIPTION

TYPE	REGISTER	RESOURCE
CP 2	CPLHI	CP Letters
	CCBHI	Call Condense Blocks
	CPHI	Call Processes
	OUTBHI	Outgoing Buffers
	MULTHI	Multiblocks
	WAKEHI	Wake up blocks
EXT	EXTHI	Extension Blocks
FTRQ	FTRQHI	Feature Queue

One existing OM (type CP2 register CPLLOW) directly corresponds to CPLHI and will be deleted in BCS24. Existing traffic usage registers which are currently provided for the above resources will become redundant and will be deleted in BCS 25.

At the beginning of each OM transfer period the active registers for all of the new registers are initialized to the current quantities of the respective resources in use. The OMs are up-dated continuously throughout the transfer period to reflect the peak number in simultaneous use. The value then placed in the holding register is the peak number of the corresponding software resources in simultaneous use during the preceding transfer period.

Accumulation of the new OMs in accumulating classes is carried out in exactly the same manner as for other OMs. Consequently the values given in OM printouts will be cumulative over the number of transfer periods. It is necessary to divide the cumulative usage by the number of transfer periods to obtain an "average" peak number of software resources in simultaneous use over the period of accumulation. True peak utilization can only be obtained by taking the maximum of the holding class values over the succeeding transfer periods and is not readily implemented in DMS-100.

OM thresholding is only partially applicable to these new OMs in that any sudden increase in resource utilization will be identified, but there will be no warning when an absolute threshold e.g., 95% has been passed.

Ref: NTP 297-1001-114 DMS-100 FAMILY OPERATIONAL MEASUREMENTS
DDOC AG0361

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	IMAGE TEST ENHANCEMENTS
Feature no	F6413

FEATURE SYNOPSIS

The purpose of this feature is to enhance the image test that runs as part of the central control (CC) routine exercise test (CC REXTST).

FEATURE DESCRIPTION

This test provides a means of detecting problems with the software load (image) under test that could prevent it from functioning properly. This allows the craftsperson to take appropriate action before a critical situation arises.

These enhancements place emphasis on the following:

- detecting some of the problems that could prevent users from logging into the switch: if a user can login, some forms of image corruption can be corrected by commands.
- store problems: tests are performed to ensure that the system that controls the switch's data store and program store is sane.

This feature helps prevent situations in which the craftsperson must go back many images before finding one that will restart successfully.

As part of the CC REXTST that runs once per day, the image is tested for restartability by running the image test on the inactive CC. The image test:

- 1) Drops the sync of the two CCs.
- 2) Performs a restart on the inactive CC.
- 3) Checks the sanity of the image on the inactive CC.
- 4) Attempts to re-sync the two CCs.

If any of the tests executed by the image test fails, the craftsperson is informed via the logs and via the MAP. An attempt is always made to re-sync the CCs in order to prevent simplex faults on the active CC from causing an outage. If the image test fails, the fault could only cause a problem if a restart is required. This would be the case if the two CCs were not synced after an image test failure and a fault occurred on the active CC. The craftsperson must take action to clear any faults detected by the image test.

The following tests are run as part of the enhanced image test:

- _ restart rotation
- _ inactive CC login
- _ critical process verification
- _ store gobbler detection
- _ store allocation
- _ trap analysis
- _ cpu load testing

Ref: DDOC AG0336

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DMS SCHEDULER CLASS FOR NOS FILE TRANSFER
Feature no	F6417

FEATURE SYNOPSIS

This feature addresses the real time impact of the interconnection of the DMS (Digital Multiplex System) and the DNC (Dynamic Network Controller). The goal is to limit the real time impact on DMS call processing and maintenance processing, while guaranteeing acceptable response delays for the centralized operations provided at the DNC end. The primary tasks are to create a new DMS process scheduler class to handle DMS/DNC file transfer transactions, to reassign other remote applications to existing process scheduler classes, and to verify that the changes listed above will guarantee acceptable response delays for the remote applications.

FEATURE DESCRIPTION

For the Phase I introduction of the Large Business Remote (LBR), several BCS 22/23 features provide centralized operation. The Phase I centralized operations are:

- Centralized maintenance and administration position (CMAP)
- Centralized alarm reporting (CALM)
- Centralized automatic message accounting (AMA) recording.

Access to these applications is provided by a DNC-500 that services all the switches in a HOST/LBR cluster, (the HOST and the LBRs are DMS-100 family switches). Therefore, the DNC interfaces with each switch in the cluster. The DNC is typically located some distance from the switches thus it can provide access to DMS applications from a central location.

There are three primary tasks associated with this feature: the addition of a new DMS scheduler process class for NOS (Network Operation System) file transfer, reassignment of other processes serving remote applications to existing process scheduler classes, and verification that the response delay time experienced by remote applications users are acceptable, after the proposed scheduler class changes are made.

Ref: DDOC BC1772, DDOC BC1419

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OUTAGE FOOTPRINT - PHASE II
Feature no	F6479

FEATURE SYNOPSIS

This feature enhances the existing outage footprint facility by improving and adding information on the outage footprint.

The outage footprint facility is designed to provide a quick method of determining the cause of an outage. The facility has three purposes:

- Provide a history of information leading to an outage.
- Take a snap shot of the system when an outage occurs.
- Provide a human readable output of outage related information.

FEATURE DESCRIPTION

This feature enhances the facilities available from the outage footprint facility. This feature operates in three modes: recording mode, snap-shotting mode, and outputting mode.

After a system image reload occurs, footprint automatically enters the recording mode. In this mode, footprint records traps, mismatches, warm restarts, cold restarts and software induced activity switches as these events will help point to the cause of the outage. This information is stored in DSSAVE. This type of data store survives every type of restart except a system image reload caused by a power loss. In that case, all recorded information is lost and recording begins again as if that restart is the initial booting of the image. The recorded events can be viewed by using the 'DUMP' command in the footprint CI directory, FOOTPRT.

Footprint enters snap-shotting mode when a CC restart occurs. This means footprint will copy critical system data such as some hardware registers and some RAM contents to a storage area for output after the outage is over. This gives the maintenance support group more information to use when analyzing the outage.

When a user requests outage-related information, footprint enters outputting mode. It displays all the events in the event buffer and displays the snap-shot associated with each warm restart, cold restart, and activity switch restart, if any. The user can have the values in selected system registers decoded into a human-readable form by using the 'TRNSL' command in the footprint CI directory, FOOTPRT.

The following list details the enhancements that have been made by this feature.

1. The mismatch event has been expanded to contain more information that might point to the cause of the outage, such as the contents of some hardware registers and some RAM locations.
2. During an out of sync restart, the event buffer on the inactive CC is copied to the active CC. This prevents the loss of information about the inactive CC that was generated while the CCs were out of sync.
3. The traceback in a restart event contains a more detailed traceback. Pre-BCS-25 footprint showed only one item in the traceback. A more detailed traceback helps in determining the origin of a restart.
4. A restart event shows which CC was active at the time of the restart. A restart event also shows if the CCs were in sync at the beginning of the restart.
5. A restart event caused by a death of initial process now contains the following information:
 - which initial process died
 - how the initial process died.
6. The CC trap rate just prior to a restart is included in the restart snap-shot. This data is unobtainable if the restart was a reload.
7. The restart numbers in the restart events in the event buffer are cross-referenced to those in the INIT logs. This assists in the analysis process.
8. A check is made on reload restarts to see if the restart was caused by a power loss. If this is the case, the footprint data is reset. This prevents incorrect information from being output.
9. Counts of the number of mismatches in the last seven days, the previous day, and the present day are given. This gives an indication of how fast an office may be degrading. This information is displayed in the CCMNT level of the MAP. Should a reload restart occur, these counts are reset and counting begins again.
10. Part of the restart snap-shot is a checksum of the locations in RAM that are considered static. This checksum is compared against a stored checksum to check for any discrepancies. This information aids in determining if the 1X44 RAM card is sane.
11. The following items are saved in the restart snap-shot, for both CCs where applicable.

Hardware registers:

- the fault indication register

- the status control register
- the resets register
- the interrupt request register
- the interrupt mask register
- the sync clock registers
- the CMC configuration register
- the mismatch status register

Additional items:

- the activity mask.

12. A new command in the footprint CI directory, TRNSL allows the user to decode each of the items in point 11 into a human-readable form.

13. Footprint has a CI directory of its own, called FOOTPRT. This makes entering footprint commands easier and faster. Only one user is allowed in the FOOTPRT CI directory at a time.

14. Information about mismatches that occur early in restarts are saved in the event buffer. This is needed to catch problems that occur before the regular mismatch handler is initialized.

15. If an event occurs during the processing of a trap or a mismatch, an indication is given that the processing of the interrupt was disrupted.

Ref: DDOC - OUTAGE FOOTPRINT PHASE II AL0044

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	DIALED LOOPBACK ON TRUNK
Feature no	F6528

FEATURE SYNOPSIS

This feature permits automatic application of loopbacks on trunks on an individual channel (DS-0) basis using normal call processing sequences. The loopback points are at the DMS-100 Network Module (NM) and looping back is on the same trunk. For loopback access, the incoming or two-way trunks need to dial a datafillable access code in the form of incoming digits to the switch. The terminating office will generate an answer signal back towards the originating office after the loopback has successfully set up on the network module.

FEATURE DESCRIPTION

This feature provides dialable loopbacks for trunks. The loopback is applied on the same incoming or two way trunk that receives the request for a loopback. The loopback is achieved in the NM by connecting the receive and transmit sides of the same trunk together.

The originating office accesses the loopbacks by using call processing procedures such as sending seizure, outpulsing digits, etc. The office providing loopbacks will activate the loopback providing:

- the incoming call is from a trunk,
- it is to terminate at this office, and
- the incoming digits match the datafilled loopback access code.

Thus a phone or a DU from an office in the network can request the far end local or PBX office for loopback on a (POTS or IBN) trunk by normal dialing.

Similarly, an office of any class in the hierarchical switching network can request a LOCAL or TOLL office in the network for a loopback by dialing from its test heads connected to the trunks.

In summary, the feature provides operating company installer and craftspersons loopback connections for evaluation of transmission paths from customer sites as well as between any two nodes of the class 4 and 5 offices in the switching network.

In addition to providing regular call progress signals such as winks and acknowledgements (in the case of using wink or delay dial signaling system), the terminating office after providing the loopback will also provide off hook (also called 'answer') signal to the originating office as indication of successful call termination.

As with normal call clear-down, established loopback calls can be taken down either by the originator at any time, or by the terminating office providing the loopback (after a datafillable timecost). In the latter case, the terminating office will remove the loopback before sending the on-hook signal and taking the trunk into idle state.

Ref: FDOC AC0285

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	FIXED TRUNK GROUP NUMBERING-SMDR
Feature no	F6564

FEATURE SYNOPSIS

Fixed trunk group numbering provides a new field in Table CLLI to store an administrative number (ADNUM) that will be associated with each common language location identifier (CLLI). Fixed trunk group numbering SMDR assigns this new field in all station message detail recording call records that include trunk group identification.

FEATURE DESCRIPTION

CLLIs are associated with a numeric value within the range of 0 to 2047 for administrative purposes. In the past, this value was determined by the order in which table CLLI was datafilled and was prone to change over dump and restore. Over a dump/restore operation, the resequencing of CLLIs would be due to deletion of entries from Table CLLI or additions of new CLLIs from EXT files. With the introduction of fixed trunk group numbering, Table CLLI will contain a new field to be data-filled by the customer. This new field, ADNUM, will contain an externally visible numeric identifier for each CLLI. This identifier will remain constant regardless of additions and deletions of table CLLI.

Fixed trunk group numbering - SMDR will impact all fields in SMDR call records that contain trunk group identifiers. These fields will now contain the administrative number, ADNUM, as found in Table CLLI.

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE AND TESTING
Feature	DYNAMIC PM RECONFIGURATION
Feature no	F6602

FEATURE SYNOPSIS

This feature allows C-side link reconfiguration, node reconfiguration, P-side link reconfiguration, and ringing data changes without having to update the static data of the affected in-service XPMs through a Return to Service.

FEATURE DESCRIPTION

This feature supports automatic inservice updates of static data, in Line Group Controllers, Line Trunk Controllers, Digital Trunk Controllers, and Remote Cluster Controllers, as a result of a link or node reconfiguration.

Ref: FDOC AG0696

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	LMD OM GROUP OPTIMIZATION
Feature no	F6627

FEATURE SYNOPSIS

This feature will reduce the CC Real Time required to collect LMD usage OM.

FEATURE DESCRIPTION

The intent of this feature is to reduce the consumption of processor time by the Operational Measurement (OM) slow-scan process OMSSAMP. This process belongs to a process class which should never consume more than 3% of available CPU time, but it has been observed to exceed 4% in offices with large numbers of lines.

The key to reducing the time spent by the OMSSAMP process is the optimization of the various slow-sampler procedures, beginning with the one which consumes the most time. This feature aims to cut the run-time of the procedure associated with the line traffic usage (LMTRU) registers of group LMD by 70%.

The LMTRU register measures occupancy in the Call Processing Busy (CPB) and Call Processing Busy-De-load (CPD) states. Although the measurement is of CC software state occupancy, the measurement accurately approximates channel usage, which is the quantity of interest to the operating company.

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	LCM O/G MESSAGE FLOW CONTROL
Feature no	F6628

Synopsis

This feature limits the number of messages sent to a Line Concentrating Module (LCM) in a given time period. This reduces the chance of activating overload control and therefore prevents messages from being lost. NT6X69 message buffers can be shared. This feature is activated only under heavy traffic to prevent the LCM from becoming overloaded.

Implementation

No other feature packages are necessary for this feature to operate.

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature can only be used on an XPM that uses the new messaging system, Feature BF0563.

This feature reduces the number of times that Feature BF0956 LCM Overload Control is activated.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AG0855

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	ENHANCED AMADUMP CAPABILITY
Feature no	F6994

FEATURE SYNOPSIS

AMADUMP is a non-resident utility that displays the contents of an Automatic Message Accounting (AMA) or Station Message Detail Recording (SMDR) file of any format in either symbolic or hexadecimal form.

This feature is a multi-part modification of AMADUMP, affecting it in the following ways:

- Removes the GRAPH, DURATION, and HELP subcommands
- Adds improvements specific to BellCore AMA format
- Improves the Command Interpreter (CI) interface
- Provides AMADUMP as resident software in all switches capable of providing AMA records.

FEATURE DESCRIPTION

BellCore Specific Changes

Beginning in BCS26, for BellCore AMA office, the DMS will support the Extended BellCore AMA Format (EBAF), ie. module code appending. The Enhanced AMADUMP Capability feature gives AMADUMP the ability to recognize module codes.

The block number of each block is displayed.

The block number, the Block Descriptor Word (BDW) and the reason the block is bad is displayed for each bad block encountered. Then, instead of skipping to the next block the display continues with the next record in the current block.

The records previously generated exclusively with the DUMP DATA subcommand are now included with the output from a DUMP CALL subcommand.

An entry number that corresponds to the appropriate filter entry is generated for entries for the filter table.

The status of the filter function is generated before the table entries for the filter table are displayed.

The character \$ indicates that no further prompting is desired during filter prompting for entry of filter fields.

The hexadecimal character a,b,c,d,e, and f are allowed during filter prompting for entry of filter fields. This gives the filter function the ability to screen for bad records.

CI Interface Improvements

DUMP Subcommand

The start block and number of blocks to dump parameters are reversed.

The lower limit of the start block parameter is increased from 0 to 1.

The upper limit of both the start block and the number of blocks to dump parameters are decreased from 32767 to 32000.

The file name is output at both the beginning and the end of the displayed data.

DUMP CALL

A reminder message is produced at the beginning of the dump, indicating that the filter function is on.

A message is displayed that says no entries were found when none of the filter criteria were met for the records in the file when a DUMP CALL is done with the filter function on.

FILTER ADD

Only one structure code (or record code) can be entered at a time when using the FILTER ADD subcommand to enter filter records.

Ref: FDOC AF0916

Package	NTX001AA21 COMMON BASIC
Feature set	ROBUSTNESS
Feature	TRAPINFO ENHANCEMENTS
Feature no	F7055

FEATURE SYNOPSIS

This feature saves trap information after a reload restart in a DMS-100 family switch.

FEATURE DESCRIPTION

When there is a trap in an office, the trap information details are saved in the trapinfo buffer.

This feature makes the trapinfo accessible after a reload restart. If an office has a reload from disk, the information in the trapinfo buffer is valid and can be dumped by the Operating Company or support personnel.

This feature preserves the last five traps after a rebooting of the system from the most recent image on the disk.

Ref: FDOC AG0695

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	FIXED TRUNK GROUP NUMBERING FOR THE OM SYSTEM
Feature no	F7058

FEATURE SYNOPSIS

This feature allows the Operational Measurement (OM) system to identify trunk groups by using the entries of the administrative number (ADNUM) field in table TRKNAME.

FEATURE DESCRIPTION

The ADNUM field has a numeric value range from 0 to 2047.

The ADNUM value has a one-to-one correspondence to a common language location identifier (CLLI). The ADNUM value of a CLLI is assigned when datafilling Table CLLI.

Table TRKNAME gets updated automatically when a change is made in Table CLLI.

The indices of the OM registers for trunk groups remain fixed over dump and restore processes and can be used to identify the corresponding CLLI through Table TRKNAME.

Ref: FDOC AG0568

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	SCHEDULED XPM PATCH APPLICATION
Feature no	F7118

FEATURE SYNOPSIS

This feature allows the Operating Company to schedule automatic application of XPM patches. Certain patches, considered unsuitable for automatic patch application, are flagged within the patch by the patch writer so they can be applied manually.

FEATURE DESCRIPTION

The development of source code patching, which provides the ability to create patches from source code, has made it possible to automatically apply XPM patches without having to take the unit out of service.

Downloaded patches go to disks specified in Table PADNDEV. The Operating Company datafills this table with the names of the disk volumes where they want patches to reside. Auto-patching can then determine where to find new patches by accessing this table.

Table PATCTRL is edited by the Operating Company to schedule automatic patch application. Once a patch is fully applied to all units of all eligible nodes the patch is removed from Table PATCTRL.

During auto-patching, a console file is kept, where any errors found during processing of a patch are reported.

Ref: FDOC AG1006

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	SCHEDULED CC/CM PATCH APPLICATION/IMAGE
Feature no	F7119

FEATURE SYNOPSIS

This feature automates the DMS CC patch application process.

FEATURE DESCRIPTION

This feature automatically calls up the commands needed for the patch application process. The patch development for Source Code Patching (SCP) and general downloading patch capabilities are unchanged.

This feature builds upon an existing patch information data structure which currently maintains a record of patch information. Information in Table PATCTRL and Table PATSET controls the automatic patch application process.

Ref: FDOC AG1007

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	DIRP RECORDING SPACE USAGE ENHANCEMENTS
Feature no	F7175

Synopsis

The Enhancements to DIRP Recording Space Usage feature allows the Device Independent Recording Package (DIRP) to keep Processed Files on disk longer before they are erased. To do this, the amount of disk space available to DIRP has been increased and the algorithm for selecting the volume on which to open a file has been improved.

Implementation

This feature adapts DIRP to use 64-megabyte volumes.

Each subsystem that sends data to DIRP is assigned a pool of volumes in Table DIRPPool. This feature increases the number of volumes that can be assigned to a pool in Table DIRPPool to 24.

This feature adds a new criterion for selecting the volume on which to put the standby file. If possible, DIRP does not open the new standby file on a volume that already contains available files or a file that was just active.

This feature requires the Disk Physical File System Rewrite feature to operate.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect any existing feature.

Restrictions

The criteria added to the volume selection algorithm by this feature are not used when volumes are selected immediately after a RELOAD restart.

Reference

FDOC AF1461

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	HX IMMUNITY REGIONS FOR C1 PROCESSES
Feature no	F7363

Synopsis

The HX Immunity Regions for CI Processes feature designates areas of software code to which the Halt Execution (HX) command does not apply.

This feature prevents the HX command from acting at a point in the software where such a stoppage would cause corruption in the system.

Implementation

No operating company action is required to implement this feature.

Areas of software code can be designated critical and until these areas have run, the HX command does not function. The system sends a message to the user's terminal when the HX will be delayed.

Processing is halted immediately when HX is entered unless the process that is running is HX immune.

The following feature package is necessary for this feature to operate:

NTX000AA Bilge

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

This feature affects only the HX command. Other means of stopping processes are not affected.

Reference

FDOC AL0972

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	OUTGOING MESSAGE FLOW CONTROL - CC
Feature no	F7381

Synopsis

This feature sets the outgoing message flow control parameters for North American line concentrating modules (LCM). The controls reside in the XPM and control the flow of messages to an LCM. The parameters are set to:

- * prevent loss of messages within the NA LCM due to bursts of outgoing messages
- * maintain the capacity of the LCM

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

The controls enabled by this activity are independent of any existing NA LCM flow controls.

This activity is only available on NA XPMs that use the messaging system provided by optional card NT6X69.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AG1262

Package	NTX001AA21 COMMON BASIC
Feature set	MAINTENANCE
Feature	CONFERENCE CIRUCIT (3/6 PORT) DIAGNOSTIC ENHANCEME
Feature no	G0060

FEATURE SYNOPSIS

This feature verifies that the conference circuit is able to pass voice communications in both directions between all ports on the conference circuit card.

FEATURE DESCRIPTION

This feature extends the 3/6 port conference circuit diagnostic to include a verification of two-way transmission between all ports on the conference circuit card.

This feature includes the following circuit packs: NT1X31AA, NT3X67AA, and the NT3X67BA.

Ref: FDOC AF1237

Package	NTX001AA21 COMMON BASIC
Feature set	ADMINISTRATION
Feature	MEMORY ADMINISTRATION - NEW OM
Feature no	G0116

Synopsis

This feature provides memory usage information for the DMS-100. The new operational measurement (OM) provides information on data store (DS) and program store (PS) usage and on the available memory. With this feature, users can track and administer the memory for either the NT-40 Central Control Complex or the DMS SuperNode.

Implementation

New OM group STORE provides operational information on DS and PS. It contains the following fields:

- * DSUSEDM: DS usage in megabytes
- * DSUSEDK: DS usage in kilobytes
- * PSUSEDM: PS usage in megabytes
- * PSUSEDK: PS usage in kilobytes
- * DSAVAILM: DS available in megabytes
- * DSAVAILK: DS available in kilobytes
- * PSAVAILM: PS available in megabytes
- * PSAVAILK: PS available in kilobytes
- * FREEEMB: total free or available megabytes
- * FREEKB: total free or available kilobytes
- * TOTALMB: total number of megabytes of memory which can be addressed by the SOS store allocator; excludes spare memory
- * TOTALKB: total number of kilobytes of memory which can be addressed by the SOS store allocator; excludes spare memory
- * MEMSPARE: spare memory in additional memory cards; = 0 for NT40

The following relationship exist between these registers:

Available store values in CCMNT is greater than or equal to

$DSAVAILM + DSAVAILK + PSAVAILM + PSAVAILK$

This relationship holds because the OMs do not include small blocks of memory that are available but can not be used for office extensions because they are fragmented.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature is not optional. It uses the OM System and Store to provide information required.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF1452

NTX006AA04 Status: RTM BUSINESS LINES

ADMINISTRATION	:	
PEG COUNT ON INWATS LINES		F0338
SERVICES	:	
INWATS	FLAT RATE	F0339
INWATS	ON TIMING REGISTERS	F0341
OUTWATS	CANADA	F0342
OUTWATS	U.S.A.	F0343
TYPES OF LINES	:	
AUTOMATIC LINE	(DATA LINE/HOT LINE)	F0344
TWX		F0345
SERVICES	:	
TWO WAY WATS LINES		F2411
TRANSLATION	:	
6 DIGIT OUTWATS BAND SCREENING		F2438
SERVICES	:	
OUTWATS TWO DIGIT ZONE SUPPORT		F2624
INWATS COMPLETION FROM LOCAL SOURCE		F2749

Package	NTX006AA04 BUSINESS LINES
Feature set	ADMINISTRATION
Feature	PEG COUNT ON INWATS LINES
Feature no	F0338

DESCRIPTION

This feature provides additional data regarding INWATS lines by pegging:

- 1) answer occurrences by line
- 2) don't answer occurrences by line
- 3) busy occurrences by line
- 4) overflow occurrences per group of INWATS line is a member of a hunt group.

Package	NTX006AA04 BUSINESS LINES		
Feature set	SERVICES		
Feature	INWATS	FLAT RATE	
Feature no	F0339		

DESCRIPTION

This feature allows a subscriber to receive telephone calls which have been placed without charge to the originating party from within specified areas.

If Measured Time billing is required a usage count is required on the line. The INWATS service and method of billing (flat rate/measured time) is assigned to the line in the office data.

If measured billing is applicable a usage register is assigned. Commands are available to read and reset individual registers or all line registers.

REFERENCE

AT&T Notes on Distance Dialing

Package	NTX006AA04 BUSINESS LINES		
Feature set	SERVICES		
Feature	INWATS	ON	TIMING REGISTERS
Feature no	F0341		

SEE FEATURE NUMBER F0339

Package	NTX006AA04 BUSINESS LINES		
Feature set	SERVICES		
Feature	OUTWATS	CANADA	
Feature no	F0342		

DESCRIPTION

This is a dial originating service only. It is employed on a station to station basis by which distance dialed calls are completed to progressively larger calling areas (called zone or bands) for which a subscriber may contract. Full time and measured calls are routed to CAMA or LAMA for billing.

Two types of services are provided:

- i) Full time services - allows unlimited calling within the contracted area for a flat rate per month, per access line.
- ii) Measured time services - calling privileges are identical but a flat monthly rate is charged for the first 10 hours usage, with an additional charge for each hour of over-time used.

The OUTWATS service, and the allowable bands are assigned to a line in the office data.

A call to a disallowed band is routed to an announcement, a tone, or an operator as specified by the telephone company.

Package	NTX006AA04 BUSINESS LINES		
Feature set	SERVICES		
Feature	OUTWATS	U.S.A.	
Feature no	F0343		

SEE FEATURE NUMBER F0342

Package	NTX006AA04 BUSINESS LINES		
Feature set	TYPES OF LINES		
Feature	AUTOMATIC LINE	(DATA LINE/HOT LINE)	
Feature no	F0344		

DESCRIPTION

On a line assigned Automatic Line service a specified called directory number is automatically outpulsed when the calling party goes off-hook. The called number is specified in the line data.

Package	NTX006AA04 BUSINESS LINES
Feature set	TYPES OF LINES
Feature	TWX
Feature no	F0345

DESCRIPTION

TWX service is assigned to a line in office data. DMS provides screening/translation and routing. TWX calls are recorded via LAMA if provided or routed to a toll office for CAMA.

REFERENCE

AT&T Notes on Distance Dialing

Package NTX006AA04 BUSINESS LINES
Feature set TRANSLATION
Feature 6 DIGIT OUTWATS BAND SCREENING
Feature no F2438

DESCRIPTION**BACKGROUND**

OUTWATS is a line feature designed to meet the needs of users who make substantial volumes of long distance calls. This capability is provided by geographical regions called service areas or zones, with the customer purchasing as many lines per zone as he requires. The arrangement of the zones varies slightly between the U.S. and Canadian systems:

- a) coverage is arranged by NPA, in concentric zones about the HNPA with each zone including all contained zones of the same type.
 - i) in some areas such as New York city, they wish to include parts of adjacent NPA's in the home zone. This is not currently supported.
- b) In Canada, the zones are numbered from 1 to 7 with zone 1 being the HNPA, zones 2 to 6 covering areas of increasing size, and zone 7 covering the entire country.
- c) In the U.S. the zones are broken into two types:
 - i) intra-state zones: zones 8,9 and 0 are used for areas of increasing size within the home state.
 - ii) inter-state zones: zones 1 to 6 cover the U.S. excluding the home state. Zones 1 to 5 cover increasingly large areas of the contiguous 48 states plus Puerto Rico and the Virgin Islands of the U.S. while zone 6 includes zone 5 plus Hawaii
- d) International OUTWATS (i.e. between Canada & U.S.) is not currently permitted.

REQUIREMENTS

A system is needed whereby the user can cause OUTWATS screening to be done based on the first six digits of the called number as opposed to the the current implementation which uses the first three digits only.

OUTWATS should also be compatible with ambiguous NPA and CO codes.

CURRENT SYSTEM

The current OUTWATS screening system takes advantage of the fact that NPA and CO (office) codes are distinguishable. If 7 digits are dialled, it will check if the SNPA (home/serving NPA) is datafilled and will use that zone if it is. If not datafilled, it will use the zone for the first 3 digits dialled. This allows the telco to partition the HNPA into several zones, if it so desires.

This scheme does not work (for partitioning the HNPA) if there are ambiguous codes in the office. (i.e. if there are FNPAs that correspond to office codes in the HNPA.)

This scheme does not allow the telco to partition FNPAs in a straightforward manner.

DESIGN APPROACH

To provide 6-digit screening and to make OUTWATS screening compatible with ambiguous codes, it is proposed that we alter the data schema of table OWATZONE as outlined in the DS section of this document. This will be an UC (upwards compatible) data change: the current data-fill will work in exactly the same way with the new system, however, the new system will allow more than one way of doing some of the current functions, to make it compatible with amb. codes.

OPTIONALITY

The OUTWATS feature is optional. This feature needs OUTWATS and will be non-optional.

Package	NTX006AA04 BUSINESS LINES
Feature set	SERVICES
Feature	OUTWATS TWO DIGIT ZONE SUPPORT
Feature no	F2624

FEATURE SYNOPSIS

This feature enhances OUTward Wide Area Telephone Service (OUTWATS) by increasing the numbers geographical zones that may be defined.

FEATURE DESCRIPTION

OUTWATS is a feature designed to meet the needs of users who make substantial volumes of long distance calls. This capability is provided by geographical regions called service areas or zones, with the customer purchasing as many lines per zone as required. Coverage is arranged by NPA in concentric zones about the HNPA with each zone including all contained zones of the same group. This feature currently allows an office to define ten zones labeled from 0 to 9.

Enhancement - This enhancement will allow each office to define up to thirteen zones. The additional three zones will be labeled with the symbols 'A', 'B' and 'C'. These symbols were chosen to avoid major changes in the I/O process for table ZONEORDR. Use of 10, 11 and 12 would have resulted in ambiguous cases. While these symbols will be used for input and output of tables, billing records will use the numbers 10, 11 and 12.

It will also allow up to thirteen vectors of OUTWATS zones to be defined in each entry of table ZONEORDR.

Optionality - This feature will be part of the standard OUTWATS feature package.

Impact - This feature does not affect any other feature.

Related Features - This feature requires the standard OUTWATS feature package.

Reference - FDOC - BR0624

Package	NTX006AA04 BUSINESS LINES
Feature set	SERVICES
Feature	INWATS COMPLETION FROM LOCAL SOURCE
Feature no	F2749

FEATURE SYNOPSIS

This feature is an enhancement to the existing INWATS feature. It provides the capability for INWATS calls to complete from the local source. This feature can be turned on by setting the office parameter INWATS_LOCAL_TERMINATION in table OFCENG.

FEATURE DESCRIPTION

This feature optimally provides the capability for local termination to inwats lines. This feature is used for:

- 1) Calls originated in the same office. This will eliminate the use of loop around arrangement for test calls to the inwats lines.
- 2) Inwats calls via incoming trunk with local (LCL) option as their originating service.

For more information refer to NTP 297-1001-451 Section 6 and G11.

Reference:

BR0749

NTX007AB02 Status: RTM PBX INTERFACE I (UPGRADE OF NTX007AA)

BUSINESS SERVICES	:	
FLASH IGNORE (PBX - 2 SEC DISC TIMING)		F0346
HUNTING OPTIONS	BRIDGED NIGHT NUMBER	F0347
HOTEL/MOTEL	REV BAT,3RD WIRE REGISTRATION	F0349
HUNTING	DIRECTORY NUMBER CIRCULAR	F0350
HUNTING	DISTRIBUTED LINE	F0351
HUNTING	MULTILINE	F0352
OVERFLOW TO:	DIRECTORY NUMBER	F0353
OVERFLOW REGISTRATION		F0354
OVERFLOW TO:	ROUTE	F0355
HUNTING OPTIONS	RANDOM MAKE BUSY	F0356
REMOTE SUBSCRIBER LINE OVERFLOW REGISTRATION		F0357
HUNTING OPTIONS	STOP HUNT	F0358
CUSTOMER SERVICES	:	
TOLL RESTRICTION		F0360
BUSINESS SERVICES	:	
HUNTING	DIRECTORY NUMBER SEQUENTIAL	F1105
OVERFLOW TO:	BUSY TONE	F1106
CUSTOMER SERVICES	:	
DIRECT OUTWARD DIAL (DOD)	ANALOG FACILITY	F1191
TYPES OF LINES	:	
PBX MESSAGE RATE		F1195
SERVICES	:	
ANSWER SUPERVISION TO PBXS FOR TOLL CALLS		F2430
CALLED PARTY HOLD ON CALLS TO PBX		F2502
BUSINESS SERVICES	:	
HUNT GROUP SIZE EXPANSION		F2750
DNH WITH CWT AND PREFERENTIAL HUNT OPTIONS		F2752
HUNT GROUP ENHANCEMENT		F5901

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	BUSINESS SERVICES
Feature	FLASH IGNORE (PBX - 2 SEC DISC TIMING)
Feature no	F0346

DESCRIPTION

This feature is assigned on a per line basis. It enables the DMS system to ignore any incoming switch hook flashes received from that line.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	HUNTING OPTIONS	BRIDGED NIGHT NUMBER	
Feature no	F0347		

DESCRIPTION

Bridged Night Numbers (BNN) can be assigned to DNH, MLH and DLH groups. This feature permits the customer to advertise a different number for night service without requiring a third wire. Scan points are not required.

For example, the customer may advertise that a different DN is to be dialed after 5:00 p.m. If the daytime DN is dialed, hunting as specified for the group will apply. If the BNN is dialed, the BNN will be rung. BNN involves the double assignment of LEN (Line Equipment Number).

Several BNN can be assigned, on an individual line basis, to a main hunt group. If required, hunting can take place among the BNN. If the BNN form a hunt group, hunting is sequential unless option CIR is assigned to the BNN group.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	HOTEL/MOTEL	REV BAT,3RD WIRE REG	
Feature no	F0349		

DESCRIPTION

Hotel rooms are equipped with extensions from one of a variety of dial PBX systems. The direct outward dialing capability is used by hotel guests placing calls within the local or extended calling area. One way out only lines are furnished at a flat monthly rate and all lines are toll denied or toll diverted.

Most hotels charge the guest for each local call completed. This is accomplished by equipping the PBX extension lines with message registers which are activated when local calls are completed.

Local Calls

Hotel/Motel PBX's require that the CO return answer supervision on PBX CO trunks for the operation of guest room message registers on local and EAS calls. Two such signalling requirements are:

a) Reverse Battery

This option is assigned to lines which are equipped with a remote hardware message register activated by reverse battery (RMR in LENLINES).

Upon called party answer, the CO will reverse the polarity of the tip and ring conductors of the PBX trunk and maintain the reversal as long as the connection is maintained and the called party remains off-hook.

b) SD Point

This option is assigned to lines which are equipped with a remote hardware message register activated by SD point (RMS in LENFEAT).

Upon called party answer, the CO will place CO battery (-48V through protective resistance) on the SD point per PBX trunk. Battery will be placed on this lead continuously upon answer of the called party.

Toll Calls

Guests access the local outgoing lines by dialing an access code, if 0 or 1 is subsequently dialed it is denied or diverted.

In non TOPS locations, Toll calls are completed by dialing an access code (i.e. 8) to reach the toll operator, or by dialing an access code to reach the PBX operator who then connects to the toll operator.

In TOPS locations, Toll calls are completed via the DMS by DDD or by dialing the regular TOPS access codes to reach the operator.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	HUNTING	DIRECTORY NUMBER CIR	
Feature no	F0350		

SEE FEATURE NUMBER F0351

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	HUNTING	DISTRIBUTED LINE	
Feature no	F0351		

DESCRIPTION

Line or station hunting provides a means of searching a number of lines to find an idle one. This applies to a group of individual lines (usually for the same subscriber) or to PBX lines.

The types of hunting provided by DMS are briefly described below:

Directory Number Hunting (DNH)

Each line in the hunt group has its own unique directory number (DN). The hunt group can be accessed by dialing the main number (called Pilot DN) or by dialing the DN of one of the hunt group members. Hunting starts at the number dialed. The number of lines hunted to find an idle line is dependent on the hunting option assigned to the DNH group.

Circular Hunting (CIR)

If option CIR (Circular hunting) is assigned to the group, all lines in the hunt group will be hunted regardless of the start point of hunting. If CIR is not assigned, the default is Sequential hunting (sometimes called Linear hunting). Sequential hunting starts at the number dialed and ends at the last number in the Hunt group. Therefore, if the Pilot DN was not dialed, not all lines will be hunted.

Multi-Line Hunting (MLH)

There is only a Pilot DN associated with the hunt group. To access the group, the Pilot is dialed. Hunting starts with the Pilot and ends at the last line, in a sequential fashion.

Distributed Line Hunting (DLH)

There is only a Pilot DN associated with the hunt group. To access the group, the Pilot is dialled. Hunting always starts on the subsequent (idle at the time last one was selected) line in the group.

DLH is assigned to large hunt groups which require equal distribution of calls.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	HUNTING	MULTILINE	
Feature no	F0352		

SEE FEATURE NUMBER F0351

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	OVERFLOW TO:	DIRECTORY NUMBER	
Feature no	F0353		

DESCRIPTION

THE FOLLOWING OVERFLOW FEATURES CAN BE ASSIGNED TO DNH, MLH AND DLH:

A) OVERFLOW TO A ROUTE (LOR).

IF ALL THE LINES IN A HUNT GROUP ARE BUSY, FEATURE LOR CAUSES HUNTING TO CONTINUE TO A SPECIFIED ROUTE INDEX.

B) OVERFLOW TO A DIRECTORY NUMBER (LOD).

THIS IS SOMETIMES CALLED SECRETARIAL HUNT. IF ALL THE LINES IN A HUNT GROUP ARE BUSY, FEATURE LOD CAUSES HUNTING TO CONTINUE TO A SPECIFIED DIRECTORY NUMBER. THIS DN CAN BE PART OF A HUNT GROUP.

C) OVERFLOW TO REGISTER

AN OVERFLOW REGISTER IS TO BE INCREMENTED EVERYTIME AN IDLE LINE CANNOT BE FOUND IN A HUNT GROUP. THIS SOFTWARE REGISTER IS SELECTED AUTOMATICALLY FOR PERMANENT ASSIGNMENT BY THE DMS SYSTEM.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	BUSINESS SERVICES
Feature	OVERFLOW REGISTRATION
Feature no	F0354

DESCRIPTION

This feature (OFS) allows a software register to be incremented everytime an idle line cannot be found in a hunt group. Up to 256 software registers can be assigned to line hunt group.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	OVERFLOW TO:	ROUTE	
Feature no	F0355		

DESCRIPTION

The following overflow features can be assigned to DNH, MLH and DLH:

a) Overflow to a Route (LOR)

If all the lines in a hunt group are busy, feature LOR causes hunting to continue to a specified route index.

b) Overflow to a Directory Number (LOD)

This is sometimes called Secretarial Hunt. If all the lines in a hunt group are busy, feature LOD causes hunting to continue to a specified directory number. This DN can be part of a hunt group.

c) Overflow to Busy Tone

If neither of the above two features are assigned and the hunt group is busy, the subscriber will hear busy tone.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	HUNTING OPTIONS	RANDOM MAKE BUSY	
Feature no	F0356		

DESCRIPTION

This feature provides a pre-selected list of lines to be turned into a one way outgoing operation only when a key is operated at the customer premises. Under this circumstance, all incoming calls to that station will receive a busy tone. However, the station can place outgoing calls and access any other features available to the station, but all line hunting to these stations will be skipped once when the key is activated.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	BUSINESS SERVICES
Feature	REMOTE SUBSCRIBER LINE OVERFLOW REGISTRATION
Feature no	F0357

DESCRIPTION

This feature increments a hardware register (OFR) and helps to determine the number of lost calls occurring in excessively busy terminal hunting groups. It can be used to determine what additional facilities may be required by certain hunting groups. The register is installed in the subscriber's premises and is operated from the central office by reverse battery over a dedicated pair of wires or via a third wire applique.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	BUSINESS SERVICES		
Feature	HUNTING OPTIONS	STOP HUNT	
Feature no	F0358		

DESCRIPTION

Stop Hunt (SHU). This cancels hunting at a line when activated. This feature can be assigned to 1, several or all lines in a hunt group. When this feature is activated (key operated) on a line in a DLH group, the hunting algorithm changes to MLH for the duration that the key is operated.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	CUSTOMER SERVICES
Feature	TOLL RESTRICTION
Feature no	F0360

DESCRIPTION

The PBX station with this service (TDN) is allowed to receive calls from the exchange network. It is denied dial access to the toll exchange network, including direct overseas dialing. Attempts to complete toll calls will be routed to:

- Attendant (intercept)
- Announcement, or
- Tone

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)		
Feature set	CUSTOMER SERVICES		
Feature	DIRECT OUTWARD DIAL (DOD)	ANALOG FACILITY	
Feature no	F1191		

DESCRIPTION

This feature permits Direct Outward Dialing (DOD) from PBX over analogue facility utilizing TM at DMS end.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	TYPES OF LINES
Feature	PBX MESSAGE RATE
Feature no	F1195

DESCRIPTION

WHEN THIS SERVICE IS EQUIPPED, A COUNT OF LOCAL MESSAGES IS ACCUMULATED FOR BILLING PURPOSES. MONTHLY CHARGES WILL CONSIST OF A FLAT RATE PORTION PLUS AN ABOVE CHARGE ON A PER CALL IN EXCESS OF A PREDETERMINED NUMBER OF LOCAL CALLS.

CALLS OUTSIDE THE LOCAL AREA ARE BILLED ON THE SAME BASIS AS THE INDIVIDUAL FLAT RATE LINE.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	SERVICES
Feature	ANSWER SUPERVISION TO PBXS FOR TOLL CALLS
Feature no	F2430

FEATURE SYNOPSIS

This feature provides answer supervision back to a PBX when the PBX is set up for call detail recording.

FEATURE DESCRIPTION

A typical network configuration has a PBX homing on a class 5 end office which in turn homes on a class 4 CAMA center. Both the PBX and the class 4 CAMA provide call detail records of toll calls, hence both require answer supervision.

At present the class 4 CAMA center sends a steady off hook signal back to the DMS-100 class 5 end office as an ANI-request (for ANI spill). Answer supervision is not provided back on an incoming CAMA connection.

This feature allows the class 4 CAMA and the class 5 end office to re-transmit answer supervision back to the PBX.

In the case where the class 5 end office has LAMA then the DMS-100 also has the ability to provide answer supervision back to the PBX.

The PBX-CO interface can be either:-

- a) Line card
- b) Two way DID/DOD analog trunk
- c) Two way DID/DOD digital trunk
- d) Two way INWATS/OUTWATS digital trunk

When this feature is provided, toll diversion and message registration will not be supported. With this feature, the ANI-Request from the class 5 office can still be either wink or steady off hook (Telco specifiable).

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	SERVICES
Feature	CALLED PARTY HOLD ON CALLS TO PBX
Feature no	F2502

FEATURE DESCRIPTION

Called Party Hold (CPH) is a feature where a terminator having the option has control of disconnect over the call (e.g. the call will not be taken down unless the terminator goes on-hook).

This feature will be made available on a per trunk group basis for calls outgoing to a PBX over a P2 trunk and on a per customer group basis for PX trunk, providing the incoming leg is not an operator trunk.

1. Called party hold on a 2-way DID/DOD PBX trunk

This feature will be provided to two way DID/DOD PBX trunks as trunk group option.

2. Called party hold on a 1 way DID PBX trunk.

Currently, one way DID service is provided to a PBX using TO (EAS) trunks (outgoing local trunks). In this new implementation, this service will be provided using one way of the P2 trunks. The called party hold option can be specified in the same manner as for other P2 trunks (trunk group data).

3. Called party hold on digital PBX trunks

This feature will be provided to PX trunks as a customer group option.

4. Called party hold on a PBX line

Called party hold option (CPH) will be added to the list of allowable options for a PBX line.

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	BUSINESS SERVICES
Feature	HUNT GROUP SIZE EXPANSION
Feature no	F2750

FEATURE SYNOPSIS

This feature enables hunt groups (directory number hunt, distributed line hunt and multiline hunt) to be defined up to 1024 members. It will not apply to bridged night number groups.

FEATURE DESCRIPTION

With this feature most DMS-100 hunt groups will support up to 1024 members. This will apply to DNH, DLH and MLH groups. BNN groups will retain their limit of 210 members. The total number of hunt groups allowed will remain at 8192.

Ref: FDOC BR0750 This Feature
AL0054 Hunt Group Enhancements

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	BUSINESS SERVICES
Feature	DNH WITH CWT AND PREFERENTIAL HUNT OPTIONS
Feature no	F2752

FEATURE SYNOPSIS

This feature adds two independent capabilities:

1. Compatibility of directory number hunt (DNH) with call waiting (CWT).
2. Compatibility of DNH with preferential hunting (PRH).

FEATURE DESCRIPTION

1. DNH With CWT:

This feature allows a line with a terminating call waiting option to be a member of a directory number hunt group. Terminating call waiting options are only effective on the member dialed and on the last member, being the highest numbered member in the list. Hunt members are exempt from the effects of originating call waiting options (CWT is taken to include CWI).

2. DNH With PRH:

This feature allows Telco to define a preferential hunt list for each of as many as 64 members of a DNH group. This list of up to 19 members (including the pilot) of the same group is searched when a call made directly to that member is unable to terminate on that member. The effect is to make that member the "pilot" of his own "hunt group".

Ref: BR0752 FDOC

Package	NTX007AB02 PBX INTERFACE I (UPGRADE OF NTX007AA)
Feature set	BUSINESS SERVICES
Feature	HUNT GROUP ENHANCEMENT
Feature no	F5901

FEATURE SYNOPSIS

This feature provides all hunt groups with operational measurements for calls terminating to hunt groups. All hunt group types are covered, i.e., DNH, DLH, MLH and BNN.

FEATURE DESCRIPTION

This feature provides table control changes and OMs for all hunt group types. Some of the table control changes are required for feature F2750 (hunt group size expansion). The maximum size of BNN (Bridged Night Number) groups will be 210. The maximum size of DNH (directory number hunt), MLH (multiline hunt) and DLH (distributed line hunt) can be up to the limit of 256 (or 1024 with feature 2750).

Ref: FDOC AL0054 This feature
BR0750 Hunt Group Size Expansion

NTX008AB02 Status: RTM PBX INTERFACE II(UPG. OF NTX008AA)

BUSINESS SERVICES	:	
DID/DOD OVER 2-WAY PBX LOOP TRUNK		F0363
DIRECT INWARD DIALLING (DID) OVER 1-WAY TRUNK TO PBX		F0364
DMO COMMAND FOR DID SERVICE		F2341
SERVICES	:	
ANSWER SUPERVISION TO PBXS FOR TOLL CALLS		F2430
CALLED PARTY HOLD ON CALLS TO PBX		F2502

Package	NTX008AB02 PBX INTERFACE II(UPG. OF NTX008AA)
Feature set	BUSINESS SERVICES
Feature	DID/DOD OVER 2-WAY PBX LOOP TRUNK
Feature no	F0363

DESCRIPTION

2-Way PBX DID/DOD PBX Loop Trunk

Feature allows direct inward dialing (DID) to a PBX and direct outward dialing (DOD) from a PBX on the same transmission facilities. A new trunk (NT2X95AA) has been developed to accommodate the above and the feature necessitates:

- a) seizure and outpulsing from the DMS to the PBX
- b) seizure and outpulsing from the PBX to DMS
- c) dial tone on receipt of seizure from PBX
- d) glare resolution
- e) DP, MF outpulsing from the DMS to the PBX
- f) DP, DGT outpulsing from the PBX to DMS

Package	NTX008AB02 PBX INTERFACE II(UPG. OF NTX008AA)
Feature set	BUSINESS SERVICES
Feature	DIRECT INWARD DIALLING (DID) OVER 1-WAY TRUNK TO P
Feature no	F0364

DESCRIPTION

This feature allows an incoming call from the exchange network (not special circuits, e.g. FX WATS) to reach a specific station line without attendant assistance. Access is subject to class of service restriction associated with the called station line. The calling party dials the 7 digit telco assigned directory number to reach the called station. When the DMS-100 interfaces with a PBX, the DMS will output the station number from the DID trunk.

Package	NTX008AB02 PBX INTERFACE II(UPG. OF NTX008AA)
Feature set	BUSINESS SERVICES
Feature	DMO COMMAND FOR DID SERVICE
Feature no	F2341

FEATURE SYNOPSIS

This feature adds two new commands to the Service Order repertory to allow association of directory numbers (or block of DN) with an office route (e.g. DID trunk group, test lines).

FEATURE DESCRIPTION

The two additional Service Order commands are NEWDN and OUTDN. The feature assigns (NEWDN) or delete (OUTDN) directory numbers that are not associated with line equipment number to an office route. These commands are invoked at service order level (by typing SERVORD at a terminal) in blocks of consecutive directory numbers. The assignment of DN's by the NEWDN command must meet the following restrictions:

- a. All DN's to be added within the block must be consecutive and unsigned.
- b. All DN's within the block must not cross the Thousand Group boundary. They must stay in the same SNPA.

These restrictions are imposed at the Service Order level.

The following is an example of how to assign DN's to an office route using the new command:

```
> newdn
  SONUMBER: NOW 82 01 24
> (CR)
  SNPA
> 613
  BLOCK OF DNs
> Y
  FROM_DN
> 2265400
  TO_DN
> 999
  DNTYPE
> rte
  ROUTE
> ofrt
```

```
RTEIDX  
> 12
```

This will assign the entire block of specified DNs from 2265400 2265999 in the SNPA of 613 to OFRT 12, provided of course that all these numbers can pass the checks performed by the SERVICE ORDER software.

Similar results can be achieved by inputting in NO_PROMPT mode as currently available in SERVICE ORDER.

Package	NTX008AB02 PBX INTERFACE II(UPG. OF NTX008AA)
Feature set	SERVICES
Feature	ANSWER SUPERVISION TO PBXS FOR TOLL CALLS
Feature no	F2430

FEATURE SYNOPSIS

This feature provides answer supervision back to a PBX when the PBX is set up for call detail recording.

FEATURE DESCRIPTION

A typical network configuration has a PBX homing on a class 5 end office which in turn homes on a class 4 CAMA center. Both the PBX and the class 4 CAMA provide call detail records of toll calls, hence both require answer supervision.

At present the class 4 CAMA center sends a steady off hook signal back to the DMS-100 class 5 end office as an ANI-request (for ANI spill). Answer supervision is not provided back on an incoming CAMA connection.

This feature allows the class 4 CAMA and the class 5 end office to re-transmit answer supervision back to the PBX.

In the case where the class 5 end office has LAMA then the DMS-100 also has the ability to provide answer supervision back to the PBX.

The PBX-CO interface can be either:-

- a) Line card
- b) Two way DID/DOD analog trunk
- c) Two way DID/DOD digital trunk
- d) Two way INWATS/OUTWATS digital trunk

When this feature is provided, toll diversion and message registration will not be supported. With this feature, the ANI-Request from the class 5 office can still be either wink or steady off hook (Telco specifiable).

Package	NTX008AB02 PBX INTERFACE II(UPG. OF NTX008AA)
Feature set	SERVICES
Feature	CALLED PARTY HOLD ON CALLS TO PBX
Feature no	F2502

FEATURE DESCRIPTION

Called Party Hold (CPH) is a feature where a terminator having the option has control of disconnect over the call (e.g. the call will not be taken down unless the terminator goes on-hook).

This feature will be made available on a per trunk group basis for calls outgoing to a PBX over a P2 trunk and on a per customer group basis for PX trunk, providing the incoming leg is not an operator trunk.

1. Called party hold on a 2-way DID/DOD PBX trunk

This feature will be provided to two way DID/DOD PBX trunks as trunk group option.

2. Called party hold on a 1 way DID PBX trunk.

Currently, one way DID service is provided to a PBX using TO (EAS) trunks (outgoing local trunks). In this new implementation, this service will be provided using one way of the P2 trunks. The called party hold option can be specified in the same manner as for other P2 trunks (trunk group data).

3. Called party hold on digital PBX trunks

This feature will be provided to PX trunks as a customer group option.

4. Called party hold on a PBX line

Called party hold option (CPH) will be added to the list of allowable options for a PBX line.

NTX019AA01 Status: RTM CIVIC SERVICES

911 EMERGENCY	:	
ALTERNATE ROUTING		F0030
SELECTIVE ROUTING		F0031
911 EMERGENCY SERVICE	:	
RING DOWN TRUNK FOR 911 SERVICE		F0446
911 SERVICE (TRUNK)		F0447
FREE EMERGENCY CALLING FROM: COIN LINES		F0747
FREE EMERGENCY CALLING FROM: MEASURED LINES		F0748
FREE EMERGENCY CALLING FROM: PUBLIC MOBILE RADIOS		F0749
911 CALL HOLD AND RINGBACK WITH ANI OUTPULSING		F0751
BUREAU FORCED DISCONNECT		F0752
CLG PARTY SWITCH HOOK STATUS AC SIGNALLING		F0753
BUREAU TO TRUNK INTEGRITY CHECK		F0754
OUTPULSING OVER 911 TRUNK		F0755
RINGBACK	CODED RINGING	F0756
RINGBACK	TIMED (FREQUENCY RINGING)	F1155
CLG PARTY SWITCH HOOK STATUS	DC SIGNALLING	F2295

Package NTX019AA01 CIVIC SERVICES
Feature set 911 EMERGENCY SERVICE
Feature RING DOWN TRUNK FOR 911 SERVICE
Feature no F0446

DESCRIPTION

DMS HAS THE ABILITY TO ROUTE 911 CALLS VIA AN OUTGOING "RINGDOWN" CIRCUIT. THIS FEATURE IS PROVIDED FROM A TYPE "B" LINE CARD. SEIZURE OF THE ESB IS VIA THE RINGING CURRENT.

BASIC 911 RINGDOWN FEATURES ARE:

- FREE EMERGENCY CALLING (SEE F0747/9) - BUREAU FORCED DISCONNECT (SEE F0752) - BUREAU TO TRUNK INTEGRITY CHECK (SEE F0754) - BUREAU HOLD (SEE F0751) - CALLING PARTY SWITCH HOOK STATUS (SEE F0753) - RINGBACK INCLUDING FAST FLASH (SEE F0756) - CALLING LINE IDENTIFICATION (SEE F0750) - SELECTIVE ROUTING (SEE FXXXX) - ALTERNATE ROUTING (SEE FXXXX)

Package NTX019AA01 CIVIC SERVICES
Feature set 911 EMERGENCY SERVICE
Feature 911 SERVICE (TRUNK)
Feature no F0447

DESCRIPTION

ON AN OPTIONAL BASIS, DMS HAS THE CAPABILITY OF OUTPULSING ANI UPON REQUEST OF A STEADY OFF-HOOK OR A WINK SIGNAL FROM THE 911 EMERGENCY BUREAU. CURRENTLY, THIS FEATURE IS OFFERED TO 911-TRUNK CONFIGURATION ONLY.

Package NTX019AA01 CIVIC SERVICES
Feature set 911 EMERGENCY SERVICE
Feature FREE EMERGENCY CALLING FROM: COIN LINES
Feature no F0747

DESCRIPTION

CALLS MADE TO THE 911 EMERGENCY SERVICE BUREAU (ESB) ARE FREE. THIS INCLUDES CALLS FROM:

1) COIN LINES

CALLS FROM PAY PHONES MAY NOT REQUIRE PREPAYMENT OR WILL RETURN THE COINS AT ESB ANSWER OR LINE ON-HOOK.

2) MEASURED LINES

3) PUBLIC MOBILE RADIO

Package	NTX019AA01 CIVIC SERVICES
Feature set	911 EMERGENCY SERVICE
Feature	FREE EMERGENCY CALLING FROM: MEASURED LINES
Feature no	F0748

SEE FEATURE NUMBER F0747

Package	NTX019AA01 CIVIC SERVICES
Feature set	911 EMERGENCY SERVICE
Feature	FREE EMERGENCY CALLING FROM: PUBLIC MOBILE RADIOS
Feature no	F0749

SEE FEATURE NUMBER F0747

Package	NTX019AA01 CIVIC SERVICES
Feature set	911 EMERGENCY SERVICE
Feature	911 CALL HOLD AND RINGBACK WITH ANI OUTPULSING
Feature no	F0751

DESCRIPTION

EMERGENCY SERVICE BUREAU (ESB) HAS ANSWERED THE CALL, ALL SWITCH HOOK TRANSITIONS OF THE CALLING PARTY ARE IGNORED, AND WHILE THE CALLER IS OFF HOOK, COMMUNICATION IS ESTABLISHED. THE CALL WILL REMAIN CONNECTED UNTIL A VALID ON HOOK IS RECEIVED FROM THE ESB.

Package NTX019AA01 CIVIC SERVICES
Feature set 911 EMERGENCY SERVICE
Feature BUREAU FORCED DISCONNECT
Feature no F0752

DESCRIPTION

THE DMS WILL PROVIDE A 0-40 SEC (TELCO MODIFIABLE IN 1 SECOND STEPS) TIMING INTERVAL (BEYOND 2 SEC FLASH TIMING) UPON BUREAU ON HOOK, IF THE CALLING PARTY REMAINS OFF HOOK. THE CONNECTION SHALL BE RELEASED AFTER THE TIMING INTERVAL.

IF THE CALLING PARTY RETURNS TO THE ON HOOK STATE DURING THE TIMING INTERVAL, TIMING WILL BE CANCELLED AND THE CONNECTION WILL BE RELEASED. IF THE BUREAU RETURNS TO THE OFF-HOOK CONNECTION BEFORE TIMEOUT OCCURS, TIMING WILL BE CANCELLED AND THE TALKING PATH RESTORED.

Package NTX019AA01 CIVIC SERVICES
Feature set 911 EMERGENCY SERVICE
Feature CLG PARTY SWITCH HOOK STATUS AC SIGNALLING
Feature no F0753

DESCRIPTION

THE FEATURE IS SLIGHTLY DIFFERENT DEPENDING ON WHETHER 911 TRUNK OR 911 LINE CONFIGURATION IS CHOSEN.

A) 911 TRUNK

AN INDICATION IS PROVIDED TO THE EMERGENCY SERVICE BUREAU (ESB) THAT THE CALLING SUBSCRIBER HAS GONE ON HOOK, EVEN THOUGH THE CALL HAS BEEN PLACED ON HOLD ON THE ESB SWITCHBOARD. THE ESB WILL BE GIVEN THE FOLLOWING SIGNALS TO INDICATE THE CALLER STATUS:

AC: IF CALLER GOES ON HOOK, BUT NOT THE ESB, STEADY LOW TONE OR BUSY TONE (DATA BASE DEFINED) IS GIVEN UNTIL THE ESB GOES ON HOOK, OR THE CALL AGAIN GOES OFF HOOK, OR RINGBACK IS APPLIED.

DC: THE SWITCH HOOK STATUS - DC FEATURE ALLOWS THE 911 CONSOLE OPERATOR TO MAINTAIN A HOLD STATE TO AN ON HOOK CALLING LINE. UPON A SUBSEQUENT OFF-HOOK FROM THE LINE, A LAMP INDICATION IS GIVEN TO THE OPERATOR SO HE/SHE MAY TALK TO A PERSON AT THE CALLING NUMBER (NOT NECESSARILY THE ORIGINAL CALLER; IT MAY BE A FIREMAN OR POLICE OFFICER).

B) 911 LINE

ESB LINES DO NOT HAVE THE OPTIONALITY OF AC/DC SWITCH HOOK STATUS. STEADY LOW TONE OR 60 IPM (BUSY) IS RETURNED TO THE ESL WHENEVER THE CALLING PARTY GOES ON-HOOK. THE TONE IS DATA BASE DEFINED AND IS GIVEN UNTIL THE ESL GOES ON-HOOK, THE CALLING PARTY GOES OFF-HOOK OR RINGBACK IS APPLIED. ALSO, POLARITY IS REVERSED ON TIP AND RING IN ADDITION TO PROVIDING SWITCH HOOK STATUS TONE.

Package NTX019AA01 CIVIC SERVICES
 Feature set 911 EMERGENCY SERVICE
 Feature BUREAU TO TRUNK INTEGRITY CHECK
 Feature no F0754

DESCRIPTION

 THIS FEATURE WORKS DIFFERENTLY DEPENDING ON WHETHER 911 TRUNK OR 911 LINE CONFIGURATION IS CHOSEN.

A) 911 TRUNK

INTEGRITY TONE (DISCONNECT TONE) TO ESB

 WHEN AN ATTEMPT IS MADE BY THE ESB TO ANSWER A CALL WHICH HAS BEEN ABANDONED AND DISCONNECTED BY THE MACHINE OR AN ATTEMPT TO ORIGINATE A CALL IS MADE, A TONE (120 IPM REORDER IN THE CASE OF DIGITAL TRUNK AND CUSTOMER SPECIFIABLE HIGH TONE OR 120 IPM REORDER TONE IN THE CASE OF ANALOG TRUNK) IS RETURNED TO THE BUREAU FOR THE DURATION OF THE SEIZURE. HOWEVER, NO TONE IS APPLIED TO THE BUREAU WHEN A MAN-MADE BUSY OR SYSTEM MADE BUSY TRUNK IS SEIZED BY THE BUREAU.

ALARM

 IF THE SEIZURE ON ANY TRUNK CONTINUES LONGER THAN A PREDETERMINED INTERVAL (DMO MODIFIABLE 10-1000 SEC), A MINOR AUDIBLE ALARM IS GENERATED. THE ALARM EXTINGUISHES ITSELF AFTER 25 SECONDS AT WHICH TIME THE TRUNK IS MADE SYS BUSY. IT WILL REMAIN THAT WAY REGARDLESS OF HOOK STATUS UNTIL THE MAINTENANCE PERSONNEL MAN BUSY AND RETURN TO SERVICE THIS TRUNK.

LOG REPORT

 A LOG MESSAGE WILL BE GENERATED FOR EACH ESB TRUNK CHANGE OF STATE (ON-HOOK TO OFF-HOOK, OFF-HOOK TO ON-HOOK) AFTER A PRE-SPECIFIED TIME OUT INTERVAL. B) 911 LINE

INTEGRITY TONE (DISCONNECT TONE) TO ESL

 WHEN AN ATTEMPT IS MADE BY THE ESL TO ANSWER A CALL WHICH HAS BEEN ABANDONED AND DISCONNECTED BY THE MACHINE, OR AN

ATTEMPT TO ORIGINATE A CALL IS MADE, THE ESL IS SENT DIAL TONE OR 120 IPM REORDER TONE (DMO MODIFIABLE) FOR THE DURATION OF THE SEIZURE.

ALARM AND LOG

IF THE SEIZURE CONDITION PERSISTS FOR MORE THAN 10 TO 1000 SECONDS, A MINOR ALARM IS INITIATED IN THE OFFICE AND A REPORT IS LOGGED. WHEN THE ESL GOES BACK ON-HOOK ANOTHER REPORT IS LOGGED. IF MORE THAN ONE ESB LINE GOES INTO ALARM STATE ADDITIONAL ALARMS AND REPORTS ARE GENERATED. THE ALARM WILL CONTINUE UNTIL ALL OFFENDING LINES GO ON-HOOK.

Package	NTX019AA01 CIVIC SERVICES
Feature set	911 EMERGENCY SERVICE
Feature	OUTPULSING OVER 911 TRUNK
Feature no	F0755

DESCRIPTION

WHEN THE EMERGENCY BUREAU IS CONNECTED TO DMS-100 VIA A TANDEM OFFICE, DMS WILL HAVE THE ABILITY TO OUTPUT DIGITS REQUIRED BY THE TANDEM OFFICE.

Package	NTX019AA01 CIVIC SERVICES	
Feature set	911 EMERGENCY SERVICE	
Feature	RINGBACK	CODED RINGING
Feature no	F0756	

DESCRIPTION

This Telco specifiable feature enables the ESB to attract the attention of a calling subscriber who has gone on-hook or gone away from an off-hook handset. In the case of 911 Ringdown, ringback is initiated by an on-hook flash from the ESL (200 ms to 2 s). If the ESL is equipped with an SP1 console (or equivalent) which generates flashes in the (150± 45 ms) range then the Fast Flash option can be used. If the Fast Flash option is chosen, then the ESL line will be scanned by the Line Module every 10 ms.

In the case of 911 Trunk, DMS can detect ringback request from the ESB in the form of a wink in the 200 ms to 2 second range (e.g. 500± 50 wink, 245 ± 45 wink).

Ringback is implemented differently according to circumstances (calling party on-hook or off-hook, single party or multi party, coded or frequency/superimposed ringing). They are detailed as follows:

a) Ringback for Lines with Coded Ringing

This type of ringback applies to subscriber lines with coded ringing scheme.

(i) Ringback to On-Hook Subscriber

- For 1FR, 2FR and 4FR ANI, a distinctive interrupted 2 second ringing signal will apply (1/2 sec. ringing, 1/2 sec. quiet, 1/2 sec. ringing, 4 1/2 sec. quiet, repeated every 6 seconds).
- For multiparty ONI and ANI Fail condition, the ringing will be applied as follows:

Ring Side: 1/2 sec ring, 1/2 sec quiet, 1/2 sec ring and 1 sec quiet.

Tip Side: 1/2 sec ring, 1/2 sec quiet, 1/2 sec ring and 2 sec quiet.

This ringing pattern is repeated every 6 seconds.

Audible ringing will be heard at the ESB except in the case of ESB trunk with DC switch hook status feature.

(ii) Ringback to Off-Hook Subscriber

On all types of originating lines, ROH tone is sent to the off-hook subscriber, and audible ringing is sent to the ESB trunk or line. The ROH tone duration is Telco specifiable from 1 to 10 sec. in steps of 1 second.

b) Ringback for Lines with Frequency or Superimposed Ringing

This type of ringback applies to subscribers' lines with frequency or superimposed ringing scheme.

(i) Ringback to On-Hook Subscriber

- For 1FR, 2FR and 4FR ANI (i.e. party-identifiable lines), the following two DMO modifiable options are available:

Option 1: Subscriber normal ringing is applied to the calling side and audible ringing is sent to the ESB except for ESB trunk with DC switch hook status.

Option 2: Timed ringback (see description under Multiparty)

- For multiparty ONI and ANI fail (i.e. party non identifiable), the following two DMO modifiable options are available:

Option 1: Ringback disabled

Option 2: Timed ringback

When timed ringback option is chosen, DMS will provide successive periods of timed ringing until all parties on the line (Tip and Ring side) have been re-rung. The per party ringing duration is DMO modifiable (two to seven ringing periods per party). With this feature, only ringing for equipped lines will be applied.

The operator will hear audible ringing for the entire period when the parties are being rung followed by switch hook status tone. However, the audible ringing will not be applied in the case of ESB trunk with DC switch hook status.

The choice of ringback option and duration selected for party identifiable lines and party non-identifiable lines is independent.

(ii) Ringback to Off-Hook Subscriber

The application is the same as ringback to off-hook subscribers with coded ringing.

Package	NTX019AA01 CIVIC SERVICES	
Feature set	911 EMERGENCY SERVICE	
Feature	RINGBACK	TIMED (FREQUENCY RIN
Feature no	F1155	

DESCRIPTION

TIMED RINGBACK IS A TYPE OF RINGBACK OPTION OFFERED TO THE TELCO. IT IS APPLICABLE TO OFFICES HAVING SUBSCRIBERS' LINES WITH FREQUENCY OR SUPER-IMPOSED RINGING SCHEME. IT CAN BE OFFERED TO BOTH PARTY IDENTIFIABLE LINES (1FR, 2FR, 4FR ANI), OR PARTY NON-IDENTIFIABLE LINES (MULTI-PARTY ONI AND ANI FAIL LINES).

FOR MORE DETAILS, REFER TO THE PREVIOUS FEATURE F0756 (RINGBACK - BASIC).

Package	NTX019AA01 CIVIC SERVICES
Feature set	911 EMERGENCY SERVICE
Feature	CLG PARTY SWITCH HOOK STATUS DC SIGNALLING
Feature no	F2295

SEE FEATURE NUMBER F0753

NTX020AC01 Status: RTM VERTICAL SERVICES I (UPGRADE FROM NTX020)

SERVICES	:	
CALL WAITING		F1020
STATION FEATURES	:	
SPEED CALLING	SHORT LIST	F1022
SPEED CALLING	LONG LIST	F1023
SERVICES	:	
THREE WAY CALLING		F2231
CALL FORWARDING (7/10 DIGITS)		F2232
FIXED CALL FORWARDING		F2255
TOLL CALL FORWARDING ENHANCEMENTS		F2469
CUSTOM CALLING - 4 SECOND DELAY CANCELLATION		F2589
ADMINISTRATION	:	
OM - PC OF POTS FEATURE ACTIVATION		F2708
EQUAL ACCESS END OFFICE(EAEO)	:	
EA - CALL FORWARDING ENHANCEMENT		F5426
STATION FEATURES	:	
EXPANDED SPEED CALL CAPABILITIES		F5431

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	SERVICES
Feature	CALL WAITING
Feature no	F1020

DESCRIPTION

a) General

Any station in the system can be equipped with this feature. It allows a subscriber already talking on an existing connection to be informed by a tone that another call is waiting to reach him on the same line. The tone is not heard either by the party on the first established connection or the new coming caller. The incoming caller only hears a regular ringing signal. The called line can put the original connection on hold and transfer to the new call, he can transfer back and forth between the two calls by means of a switch hook flash. Only one call can wait at a time. If the fourth party wants to break into the line, he will receive a busy tone. If the customer wants to terminate the original call and accepts the waiting call, he may do so by putting the phone on-hook and his telephone will ring, provided that the waiting call has not been abandoned.

b) Restrictions

1. If the called station is engaged with one of the following features, call waiting will be denied:
 - i - three way calling feature
 - ii - call forwarding feature (phase 1)
 - iii - 611, 711 or 911 features
 - iv - calls coming from operator trunks (TOPS, TSPS)
2. There is a maximum of one call that can be call waited.
3. A call will only be waited if the called station is talking.
4. Call waiting will be denied to hunt groups.
5. The call will not be waited if the calling is coin line (phase 1).
6. Billing will be provided in phase 2.

c) Hardware Requirement

Service circuit (NT3X68AC) is used to provide 440 Hz Call Waiting Tone.

REFERENCES

SP-1 Specifications for Custom Feature

IBN Feature Specification for 500/200 Station Sets 'POTS Portion'

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)		
Feature set	STATION FEATURES		
Feature	SPEED CALLING	SHORT LIST	
Feature no	F1022		

DESCRIPTION

a) General

This feature allows a single party user to call any one of a group of frequently called numbers by dialing a one or two digit abbreviated code. Speed calling 'short list' allows the user to assign numbers to codes '2' through '9', and 'long list' allows assignment to codes '20' through '49'. A subscriber may have both a short and a long list.

b) Code Assignment

To assign or change an abbreviated code, the subscriber goes off-hook, receives dial tone, and dials the update code (currently 74 or 75 for short or long list, respectively). He then waits for inter-digital short timeout (about 4 seconds) or dials octothorpe. Special dial tone is returned. He then dials the abbreviated code followed by the directory number to be assigned to that code. The directory number must be prefixed (with 1, 011, or 0 etc.) if such a prefix would be required for normal dialing of that number. The subscriber then waits for inter-digital short timeout, or dials octothorpe. Confirmation tone is returned to the subscriber to indicate successful assignment.

To de-assign a code (speed call 'ZAP'), the subscriber goes off-hook, receives dial tone, and then dials the update code. He waits for inter-digital short timeout, or dials octothorpe. Special dial tone is returned. The subscriber then dials the abbreviated code to be de-assigned, and waits for inter-digital timeout or dials octothorpe. Confirmation tone is always returned, even if the code was already unassigned.

NOTES

1. Eventually, assignment to any DDD or DDO number will be allowed. However, in the initial release of this feature, assignment will

be restricted to seven or ten digit local numbers and operator assisted calls.

2. The number that the subscriber dials is partially verified by actually performing translation and screening on it. For example, if the subscriber dials an invalid NNX as part of the number to be stored, then the assignment will be blocked. This verification will catch any invalid digit combination except a blank DN (this is due to the structure of DN translation). If the assignment is blocked, then the appropriate treatment is returned to the subscriber.
3. If the abbreviated code is invalid, then reorder is returned.
4. The number that the subscriber dials may be an abbreviated code. For example, if code 20 is already assigned, he can dial:

75# <SPECIAL DIAL TONE> 3320#

code 33 now represents the same stored number as code 20.
5. The subscriber may not store an assignment code. For example, the combination:

75# <SPECIAL DIAL TONE> 3375#

results in reorder being returned to the subscriber.
6. Short inter-digital timing is applied between all digits once special dial tone has been applied.
7. If a subscriber without speed calling dials an assignment code, partial dial treatment is returned.
8. The customer-filled speed calling lists are accessible and modifiable by the telco. If the office has the journal file option, then a journal file record is kept of each update to a speed call list. Also, if the office has journal file, and it is not active, then no updates to a speed call list will be allowed (reorder is returned).
9. Special dial tone consists of three 100ms bursts of dial tone, followed by steady dial tone. Confirmation tone is 150ms of dial tone, 150ms of silence, 300ms of dial tone, and then silence.

c) Activation

The subscriber goes off-hook, receives dial tone, and then dials the abbreviated code and waits for inter-digital short timeout (or dials

octothorpe). From this point on, the call proceeds as if the subscriber had dialed the full set of digits. In particular, billing is done as for a normal call (e.g. the LAMA billing entry does not indicate that an abbreviated code was used).

NOTES

1. Dialing an unassigned abbreviated code results in reorder being returned to the subscriber.
2. If the abbreviated code is out of range, then partial dial is returned.
3. If a subscriber without speed calling dials a valid abbreviated code, then partial dial treatment is returned.

d) Interaction with Other Custom Calling Features

1. Speed calling is transparent to call forwarding i.e. a subscriber can assign or use an abbreviated code while call forwarding is active, without noticing any difference in the behaviour of the feature. Also, call forwarding can be activated with an abbreviated code.

e.g. 72# <SPECIAL DIAL TONE> 34#

will activate call forwarding to the number stored in abbreviated code '34'. The subscriber cannot, however, assign the call forwarding activation code (currently 72) to an abbreviated code.

2. In a three way call, the subscriber can use an abbreviated code to initiate the second call (after he has flashed and received dial tone). He cannot use the second call to update his speed call list.
3. Speed calling has no effect on call waiting.

Package NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set STATION FEATURES
Feature SPEED CALLING LONG LIST
Feature no F1023

SEE FEATURE NUMBER F1022

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	SERVICES
Feature	THREE WAY CALLING
Feature no	F2231

DESCRIPTION

THIS FEATURE ALLOWS A SUBSCRIBER TO ADD A THIRD PARTY TO A CONNECTION WITHOUT OPERATOR ASSISTANCE. WHEN THE THIRD PARTY ANSWERS, A PRIVATE TWO-WAY CONVERSATION CAN BE HELD BEFORE BRIDGING THE CONNECTION FOR A THREE-WAY CONFERENCE.

THE PROCEDURE IS AS FOLLOWS:

1. THE SUBSCRIBER REMAINS ON THE LINE AND ADVISES THE CALLING PARTY THAT A THIRD PARTY IS GOING TO BE ADDED TO THE CONVERSATION.
2. THE SUBSCRIBER FLASHES ONCE DMS RETURNS SPECIAL DIAL TONE.
3. THE SUBSCRIBER KEYS OR DIALS THE DESIRED STATION.
4. THE SUBSCRIBER ANNOUNCES THE CALL TO THE THIRD PARTY.
5. THE SUBSCRIBER FLASHES ONCE TO ESTABLISH A THREE-WAY CONVERSATION.

IN ADDITION, THE SUBSCRIBER MAY DISCONNECT THE THIRD PARTY FROM THE CONFERENCE BY FLASHING ONCE.

THIS FEATURE CAN BE USED FOR BOTH INCOMING AND OUTGOING CALLS.

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	SERVICES
Feature	CALL FORWARDING (7/10 DIGITS)
Feature no	F2232

DESCRIPTION

CALL FORWARDING IS A FEATURE WHICH PERMITS A SUBSCRIBER (REFERRED TO AS BASE STATION) TO SPECIFY A DIRECTORY NUMBER TO WHICH INCOMING CALLS DESTINED FOR THE BASE STATION SHOULD BE RE-ROUTED. THE FEATURE IS CUSTOMER ACTIVATED/DEACTIVATED AND, WHEN ACTIVATED, INCOMING CALLS TO THE BASE STATION ARE AUTOMATICALLY RE-ROUTED. WHEN A CALL IS BEING FORWARDED, A BRIEF RING (0.5 SECS) IS GIVEN TO THE BASE STATION AS A REMINDER THAT FORWARDING IS IN EFFECT. BASE STATION CAN ORIGINATE CALLS WITH FORWARDING FEATURE ACTIVE.

IN AN OFFICE EQUIPPED WITH LAMA, FORWARDING IS PERMISSABLE TO ANY VALID DIRECTORY NUMBER, OTHERWISE, IT IS RESTRICTED TO DIRECTORY NUMBERS WITHIN THE LINES FREE CALLING AREA.

THE ACTIVATION SEQUENCE IS:

- SUBSCRIBER DIALS A SPECIAL ACCESS CODE
- DMS RETURNS SPECIAL DIAL TONE
- SUBSCRIBERS DIALS FORWARDING NUMBER AND DMS SETS UP THE CALL TO THAT NUMBER
- IF ANSWER RECEIVED DMS STORES THE NUMBER
- IF ANSWER IS NOT RECEIVED THE SUBSCRIBER REDIALS SPECIAL ACCESS CODE AND FORWARDING NUMBER AND DMS RETURNS CONFIRMATION TONE.

TO DEACTIVATE THE FEATURE THE SUBSCRIBER DIALS THE SPECIAL ACCESS CODE.

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	SERVICES
Feature	FIXED CALL FORWARDING
Feature no	F2255

DESCRIPTION

This feature allows any incoming calls to a line to be automatically routed to a predetermined telephone number. This number can be within the local calling area, and EAS exchange, home NPA, foreign NPA or overseas.

The subscriber can activate or deactivate this feature from the base station (calls are being forwarded from a base station to a remote station).

Fixed call forwarding differs from the standard call forwarding in the fact that calls are forwarded to a predesignated fixed number. With standard call forwarding calls are forwarded to a number which is programmed during the feature activation.

To activate or deactivate fixed call forwarding the subscriber will dial the activation or deactivation code respectively. The DMS will then return confirmation tone.

The DMS will provide both the fixed and standard call forwarding. The Line class-of-service will specify the requirement of fixed call forwarding (if call forwarding is provided to a line it will be either fixed or standard but not both).

The activation/deactivation codes should be the same for fixed and standard call forwarding. With fixed call forwarding the number to which calls are being forwarded can only be changed by means of service orders through the Tel. Co.

The subscriber can forward calls over the toll network only if the base station is connected to a DMS LAMA office. If the base station is connected to a non LAMA office, calls may be forwarded to remote stations within the free calling area.

If the incoming call to be forwarded is toll, the calling party will be charged for the call to the base station by the local or toll office. The base station will be charged for the call to the remote station (this assumes that the call is chargeable and is answered by the remote station).

While call forwarding is active, the base station can still originate calls. While call forwarding is active an incoming call which is forwarded will cause the base station, if idle, to be rung for 500 msec once only as a reminder. The call cannot be answered by the base station.

REFERENCES

FPS No. 232 Call Forwarding
VO #2 4.3.2.7.1

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	SERVICES
Feature	TOLL CALL FORWARDING ENHANCEMENTS
Feature no	F2469

FUNCTIONAL DESCRIPTION

BACKGROUND:

Toll Call Forwarding is a subset of the Call Forwarding (CFW) feature implemented in software package NTX020AB. There currently does not exist any facility whereby in a non-lama office the specific route to be taken can be datafilled in table CFW.

DESCRIPTION:

The following enhancements will be required to provide the abilities described for feature R0469:

(a) TABLE CFW - ADDING SCREENING CLASS

The logical tuples for regular and fixed call forwarding will now have an additional field called SCRNCCL. This field can accept a screening class or nil screening class(NSCR) as input. When a screening class is specified class of service screening will be done using the specified class of service subtable. If no screening is desired then nil screening(NSCR) should be specified. This screening will be done in both LAMA and NON-LAMA offices. Service orders will reflect these changes.

```
*** It will be up to the Telco to ensure that the ***
*** specified screening subtable eventually routes ***
*** the call to a trunk of appropriate type. ***
```

(b) WINK ANI REQUESTS

The following trunk types will support a WINK ANI request:

```
i - OC
ii - A5
iii - OP
```

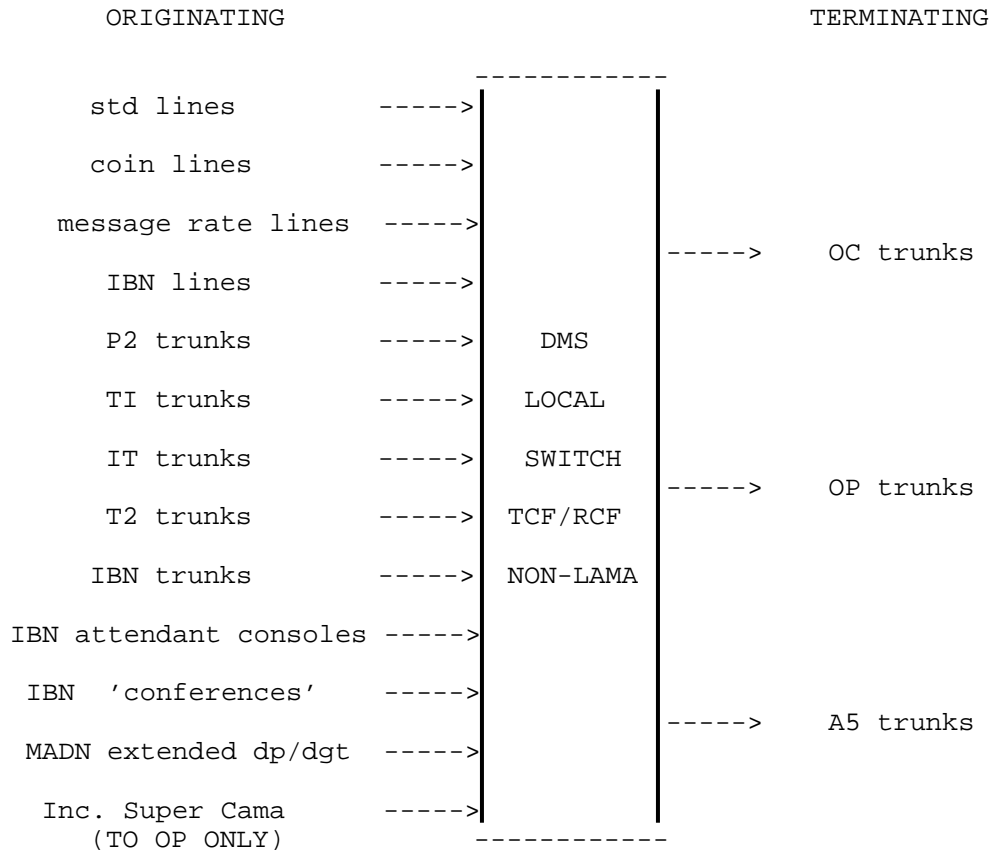
The following originators will be supported in going to a trunk which has a WINK ANI request:

```
i - standard lines
ii - coin lines
iii - message rate lines
iv - IBN lines
v - P2 trunks
```

- vi - TI trunks
- vii - T2 trunks
- viii - IT trunks
- ix - IBN trunks
- x - IBN attendant consoles

- xi - MADN extended dp/dgt line
- xii - Super Cama (SC) **** TO OP ONLY ****
- xiii - IBN meet me conference
- xiv - IBN attendant conference
- xv - IBN preset conference
- xvi - IBN flexible station controlled conference

This diagram illustrates the originators which can call a CFW number and get forwarded to a trunk which supports a WINK ANI request.



To support a WINK ANI request on OP trunks a new field will be provided in table TRKGRP for the OP trunk refinement. The new field ANITYPE can be datafilled with REV(reversal) or WK(wink). The standard default for this field is REV. Trunk types OC and A5 already support WINK ANI requests.

The ANI spill format for A5 trunks is different than the ANI spill for 'OC' type trunks. When doing a test call from the ttp appropriate ANI spill must be given. To do this a new office parm called TEST_CALL_AMR_SPILL will be created. This parm will live in table OFCVAR and will appear in all offices with A5 or OSC trunks.

This item is not actually part of this feature but is a need which has been recognized.

(c) ROUTING ON COMBINED TRUNK GROUPS

The ability to route over combined trunk groups already exists for calls originating from a line in the same office. The ANI fail treatment will be the same as for the entire group. For calls originating from incoming trunks those routing to an OP or an OC type trunk currently meet the above requirement. Trunk type A5 will be given this ability with this feature.

It's important to note that the trunk group should have a WINK ANI request to ensure true answer supervision is used.

It's up to the other office to handle RCF/TCF and CAMA traffic on the same group. DMS200 offices have this capability.

(d) TRAFFIC MEASUREMENTS

The following traffic measurements will be provided on a per office basis:

1. Call Forwarding Activation Attempts to Legitimate Numbers - Number of times a subscriber of the feature attempts to activate call forwarding. An activation attempt is defined as dialing the activation code plus a complete legitimate telephone number.
2. Successful Call Forwarding Activation - Activation successfully completed by answer of remote station.
3. Successful Call Forwarding Activations - Activation successfully completed by a second activation procedure. A second activation attempt cannot result in an answer as there is no attempt to complete.
4. Call Forwarding Deflected - This count will be comprised of calls which are not forwarded for the following reasons:
 - i - originator is a test facility
 - ii - block toll completing calls in effect
 - iii - no service circuit (cfw extension block)
 - iv - maximum cfw chain size reached
 - v - cfw dn had denied termination or suspension
5. Calls Forwarded - Count of the number of calls which are offered for forwarding, includes counts in 4.

This item will be provided by creating a new OM group called CFW.

NOTE: This feature DOES NOT involve IBN call forwarding.

OPTIONALITY

- the wink on OP trunks will appear in all offices which support OP trunks
- the OMs will be allocated in an optional subsystem

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	SERVICES
Feature	CUSTOM CALLING - 4 SECOND DELAY CANCELLATION
Feature no	F2589

FEATURE SYNOPSIS

A service prefix ("*" or "11") may be used prior to the following to eliminate the present 4 second timeout:

- speed calling activation/deactivation service access code
- call forwarding activation/deactivation service access code
- 2-digit speed calling abbreviation code

This service prefix may not be used prior to 1-digit speed calling abbreviation codes.

This service prefix is incompatible with the dialling plan in British Columbia, the Barbados and Puerto Rico, and will not be available in these areas.

FEATURE DESCRIPTION

This feature will be incorporated into the digit collection software. Table affected is OFCSTD. To inhibit the feature in British Columbia, Barbados and Puerto Rico, the office parameter DIGIT_COL_OFFICE_CODE is set. The value 3 represents the Barbados, 4 - Puerto Rico and, 8 represents British Columbia.

References

Data Schema (table OFCSTD)

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	ADMINISTRATION
Feature	OM - PC OF POTS FEATURE ACTIVATION
Feature no	F2708

FEATURE SYNOPSIS

This feature provides peg counts of feature activation (i.e., the process of programming) and feature function (i.e., the actual use of the feature) for the following features:

Call forwarding (F and C) - activation, function
 Speed calling (SCI and SC2) - activation, function
 Three-way calling - function
 Call waiting - function

FEATURE DESCRIPTION

This feature adds four new OM groups which provide a detailed information to telco as to feature usage and reasons for feature failures. The new OM groups are:

1. CFWPOTS - Call forwarding (replacing CFW group) with activation registers:

CFWPAATT (No. of activation attempts, ie, dialing of act code and DN)
 CFWPSUCC1 (No. of activations successfully completed by answer)
 CFWPSUCC2 (No. of activations successfully completed by 2nd attempt)
 CFPADOVFL (No. of failed act attempts because CFW_EXT_BLOCK not available)
 CFPDENY (No. of act attempts with invalid DN)

and function registers:

CFWPFATT (No. of attempts to call forward a call)
 CFPFOVFL (No. of failed attempts to call forward because CFW_EXT_BLOCK not available)
 CFPFDENY (No. of attempts to call forward on non-call-forwardable call).

2. SCPOTS - Speed Calling with activation registers:

SCPAATT (# of attempts to program a speed call call)
 SCPAOVFL (# of failed attempts to program due to lack of HEAP mem)
 SCPADENY (# of failed attempts to program because call code out of range)

and function registers:

SCPFATT (# of attempts to use speed calling)
 SCPFDENY (# of empty speed call calls dialed)

3. TWCPOTS - Three-way calling with function registers:

TWCPATT (# of line flashes to use TWC)
TWCPOVFL (# of failed attempts due to lack of resources)
TWCPDENY (# of failed attempts because caller is not in talking state)
TWCPABDN (# of abandons after special dial tone).

4. CWTPOTS - call waiting with function registers:

CWPATT (# of calls to a busy DN with CWT option)
CWTPOVFL (# of CWT calls failed due to lack of resources)
CWTPDENY (# of calls denied due to certain restrictions)
CWTPABDN (# of CWT calls abandoned because called party does not flash to answer)

References:

BR0708 FDOC
NTP 297-1001-114 Operational Measurements

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EA - CALL FORWARDING ENHANCEMENT
Feature no	F5426

FEATURE SYNOPSIS

The purpose of this feature is to provide the POTS customer with the capability of call-forwarding and remote call-forwarding a line via the common carrier of his choice, and to any valid directory number (DN) of up to 24 digits (including the 10XXX prefix digits signifying the carrier). This will allow a line to be call-forwarded to international zones as well.

FEATURE DESCRIPTION

Call-forwarding - Fixed and Customer Activated

Present POTS call forwarding only allows the customer to use the presubscribed carrier (PIC) which has already been assigned to his line. As well, the line can only be forwarded up to a 10 digit DN, which excludes most international calls.

With this feature, the POS customer will not be restricted to using his PIC to call forward to, nor will he be limited to a domestic call. For customer activated CFW, the person dials either (1/011)+digits or 10XXX+(1/011)+digits and is routed via his PIC or the default carrier (in an equal access office) in the former case, or the carrier corresponding to the XXX dialed in the latter case. The digits can be for a no-prefix local (NP) call, in which case it will go via the BOC, or a direct dialed (DD) domestic or international call. As before, the customer must dial 72# to activate CFW and 73# to deactivate CFW. For fixed call forwarded calls done via service orders, a carrier will be selected at that time to go out on by entering the (1/011)+digits or 10XXX+(1/011)+digits at the FWDDN prompt.

Remote Call Forwarding

Present POTS remote call forwarding does allow the customer to choose a carrier to go out on (as of BCS17), but again, only 10 digits can be stored.

With the implementation of this feature, the POTS customer will be able to remote call forward up to 24 digits, which will allow him to make international calls. Via service orders, the Telco will enter the entire FWDDN including prefix digits, into the FWDDN field. As with regular call forwarding, there will no longer be a TS or TC field. Instead, if the Telco does not specify a route, but wants a screening class, he will be prompted for a pretranslator name (PRTNM).

For equal access RCF the Telco will be prompted not only for a PRTNM, but also for a LATANM. He will no longer be prompted for a CARRIER or a LCC since he will put the 10XXX digits into the FWDDN field and will now have access to a PRTNM and a LATANM.

As with regular call forwarding, only direct dialed calls will be allowed to go through - call forwarding or remote call forwarding 0+, 0-, or 01 is not allowed.

Reference

FDOC BC1381

Package	NTX020AC01 VERTICAL SERVICES I (UPGRADE FROM NTX020AB)
Feature set	STATION FEATURES
Feature	EXPANDED SPEED CALL CAPABILITIES
Feature no	F5431

FEATURE SYNOPSIS

This feature will allow customers with 1 digit speed calling and 2 digit speed calling to store numbers up to 24 digits in length corresponding to each abbreviation code in their speed calling list. This feature applies to the POTS environment only.

FEATURE DESCRIPTION

The purpose of this feature is to modify the existing speed calling feature to allow a customer to program called numbers of up to 24 digits in length against each speed calling abbreviation code. The current limit permitted by both the 1 and 2 digit speed calling features is 15 digits.

The requirement for this capability has arisen with the proliferation of common carriers in the United States which require customers to dial access codes preceding the numbers which they intend to reach, thus indicating which carrier they wish to choose to switch their call. These feature enhancements are also required by those customers dialing overseas calls which require more than 15 digits to be stored against each speed calling abbreviation code.

No changes will be made to the present speed calling features with respect to the confirmation tone a customer receives after programming a number into their speed calling list. The confirmation tone is used to indicate that the number corresponding to the speed calling abbreviation code is a valid one. There will also be no changes to the current method of dialing service access codes which the customer dials when they wish to make a change or update in their speed calling list.

Thus, as a result of this feature the dialing sequence a customer follows is to first dial the 1 or 2 digit speed calling activation code (74 or 75) and when the confirmation tone is heard, the 1 or 2 digit speed calling abbreviation code followed by the number (up to 24 digits) which they wish to enter into their speed calling list followed by an octothorpe (#) or a 4 second timeout.

NTX021AA04 Status: RTM REMOTE CALL FORWARDING

SERVICES	:		
REMOTE CALL FORWARDING	-	LAMA MODE	F1027
REMOTE CALL FORWARDING	-	CAMA MODE	F1238
SERVICE ORDER FOR RCF			F1798
RCF ENHANCEMENTS			F2505
REMOTE CALL FORWARDING	:		
MESSAGE RATE REMOTE CALL FORWARDING BASE DN			F2815

Package	NTX021AA04 REMOTE CALL FORWARDING		
Feature set	SERVICES		
Feature	REMOTE CALL FORWARDING	- LAMA MODE	
Feature no	F1027		

FEATURE SYNOPSIS

Remote Call Forwarding (RCF) feature allows subscribers to rent a directory number (RCF base number) in a remote location. Calls placed to this number is automatically forwarded via the toll network to the subscriber's principal number. The RCF subscriber is billed for the forwarded portion of the call.

This feature is applicable for DMS-100 or DMS 100/200 offices equipped with LAMA.

FEATURE DESCRIPTION
-----a. Feature Activation and Deactivation

The feature is activated and deactivated via Data Modification Order (DMO) at the DS switch.

b. Forwarding of Incoming Calls

A seven or ten digit call forwarding number (RCF terminating number) is stored against the RCF base number. Whenever the base DN is dialled the call forwarding number will be outpulsed.

Multiple calls may be forwarded through the same RCF base number. The maximum number of simultaneous calls allowed is DMO assignable and normally corresponds to the size of a distant hunt group to which the RCF terminating number is corrected.

c. Billing

RCF calls utilize LAMA billing procedures and are grouped with the regular DDD traffic over a common trunk group to the toll office. A call arriving at the RCF base number will be translated as a AMA origination with the RCF base number as the calling number and the RCF terminating number as the called number.

d. Call Blocking

Calls from toll completing trunks may be blocked via DMO.

e. Identification of Calls to RCF Base Numbers

As an operations and trouble shooting aid, identification of the originating line or trunk to maintenance personnel is provided on calls to RCF base numbers. A table called RCF CLI allows monitoring of up to 8 RCF base numbers selectable via DMO.

f. Operational Measurements

An assignable register per RCF base number has been provided up to 64 numbers for pegging the total calls offered.

Package	NTX021AA04 REMOTE CALL FORWARDING		
Feature set	SERVICES		
Feature	REMOTE CALL FORWARDING	- CAMA MODE	
Feature no	F1238		

FEATURE SYNOPSIS

Remote Call Forwarding (RCF) feature allows subscribers to rent a directory number (RCF base number) in a remote location. Calls placed to this number is automatically forwarded via the toll networks to the subscriber's principal number. The RCF subscriber is billed for the forwarded portion of the call.

This feature is applicable for DMS-100/200 offices without LAMA feature.

FEATURE DESCRIPTION

a. Feature Activation and Deactivation

The feature is activated and deactivated via Data Modification Order (DMO) at the DMS switch.

b. Forwarding of Incoming Calls

A seven or ten digit call forwarding number (RCF terminating number) is stored against the RCF base number. Whenever the base DN is dialled the call forwarding number will be outpulsed.

Multiple calls may be forwarded through the same RCF base number. The maximum number of simultaneous calls allowed is DMO assignable and normally corresponds to the size of a distant hunt group to which the RCF terminating number is connected.

c. Billing

Recording of billing data for RCF calls is done in the connecting CAMA DMS Toll Office. A separate CAMA trunk group between the RCF base office and its toll office is required for exclusive use by RCF calls. The Toll Office must distinguish between the RCF calls and the DDD calls to accord proper ANI foil and answer supervision treatment.

d. Call Blocking

Calls from toll completing trunks may be blocked via DMO.

e. Identification of Calls to RCF Base Number

As an operations and trouble shooting aid, identification of the originating line or trunk to maintenance personnel is provided on calls to RCF base numbers. A table called RCF CLI allows monitoring of up to 8 RCF base numbers selectable via DMO.

f. Operational Measurements

An assignable register per RCF base number has been provided up to 64 numbers for pegging the total calls offered.

g. Special ANI Request Recognition

A wink type signal (nominal 140 msec) from an O/G RCF trunk is recognized as an ANI request signal. The off hook/on hook wink is required to prevent a false answer indication (normal ANI off hook signal) from reaching the calling subscriber CAMA/LAMA office on DDD originated calls.

The RCF base number will be outputted in response to the ANI request signal in standard ANI format.

Package	NTX021AA04 REMOTE CALL FORWARDING
Feature set	SERVICES
Feature	RCF ENHANCEMENTS
Feature no	F2505

FUNCTIONAL DESCRIPTION

BACKGROUND:

Remote Call Forwarding(RCF) was originally implemented in DMS local LAMA offices by feature R0323 - 'REMOTE CALL FORWARDING'.

Some NON-LAMA enhancements were provided by feature C0606 - 'SUPPORT RCF IN NON-LAMA OFFICES' and R0453 - 'OUTPUT BELL ANI ON WINK IN OCAM'. The standard Bell ANI request is a reversal, this reversal also masks the true answer from being seen. The wink ANI request provides for discrete events for both the ANI request and the answer. When dealing with an RCF call in a NON-LAMA office the need for a discrete answer event arises from the fact that the first leg of the call may be billable and thus the RCF office must pass answer supervision back to the originating office for billing purposes. The requirement for a dedicated trunk group comes from the need to provide treatment for ANI failures rather than routing the call to a position.

DESCRIPTION:

The basic requirement of this feature is to provide the capability to route RCF calls to toll offices equipped with Bell Cama or North AMR4/5 ticketing systems via dedicated or combined trunk groups(data fillable). The ANI will be outpulsed upon receipt of a wink signal. DMS200 CAMA/ TOPS offices will route these calls to a treatment only if these calls are received via a dedicated trunk group upon an ANI failure condition.

The IBN features CFX and CFU are not affected by this feature.

The following enhancements to the existing optional software package NTX021AA - Remote Call Forwarding will be provided :

(a) TABLE CFW

The existing data tuple for RCF in table CFW will be changed.

- i) Two new fields will be added which will provide the telco the ability to datafill an office route index or a class of service screening subtable. A new selector, RTEORSCR, will require an entry of RTE to datafill an office route index in field OFRTINDX, or an entry of SCR to datafill a screening class in the new field SCRNCCL. Note that only one of OFRTINDX or SCRNCCL can be datafilled

as these fields are determined by the selector RTEORSCR.

The new capability of specifying a SCREENING CLASS will be more flexible than using an OFFICE ROUTE INDEX. The field OFRTINDX will only be used in a NON-LAMA office, whereas SCRNCCL will be used in LAMA and NON-LAMA offices.

In any case the route eventually taken by the RCF call should go to a trunk group which has a WINK ANI request so that true answer supervision can be passed back to the originating office. The trunk types which will support a WINK ANI request are OC, OP, and A5.

IT WILL BE UP TO THE TELCO to ensure that a trunk which has wink ANI request is taken for RCF calls. Any other trunk will result in a false answer being propagated to the originating office and may result in improper billing functions.

- ii) The field LAMAOFRT will be removed, this field's function was to enable the telco to take the route specified by OFRTINDX in a LAMA office. The field SCRNCCL can now be used for this function.

In any office where no particular route is to be taken a 'nil' entry can be datafilled by specifying either a nil screening class or office route index zero(0).

As a result of A(i) and A(ii) the decision logic will be changed so that if OFRTINDX is datafilled, it will only be used in a NON-LAMA OFFICE. If SCRNCCL is datafilled it will be used in both LAMA and NON-LAMA environments. A nil screening class is specified by datafilling NSCR.

NOTE ** service orders will reflect these data changes. **

(b) WINK ANI REQUESTS

The following trunk types will support a WINK ANI request:

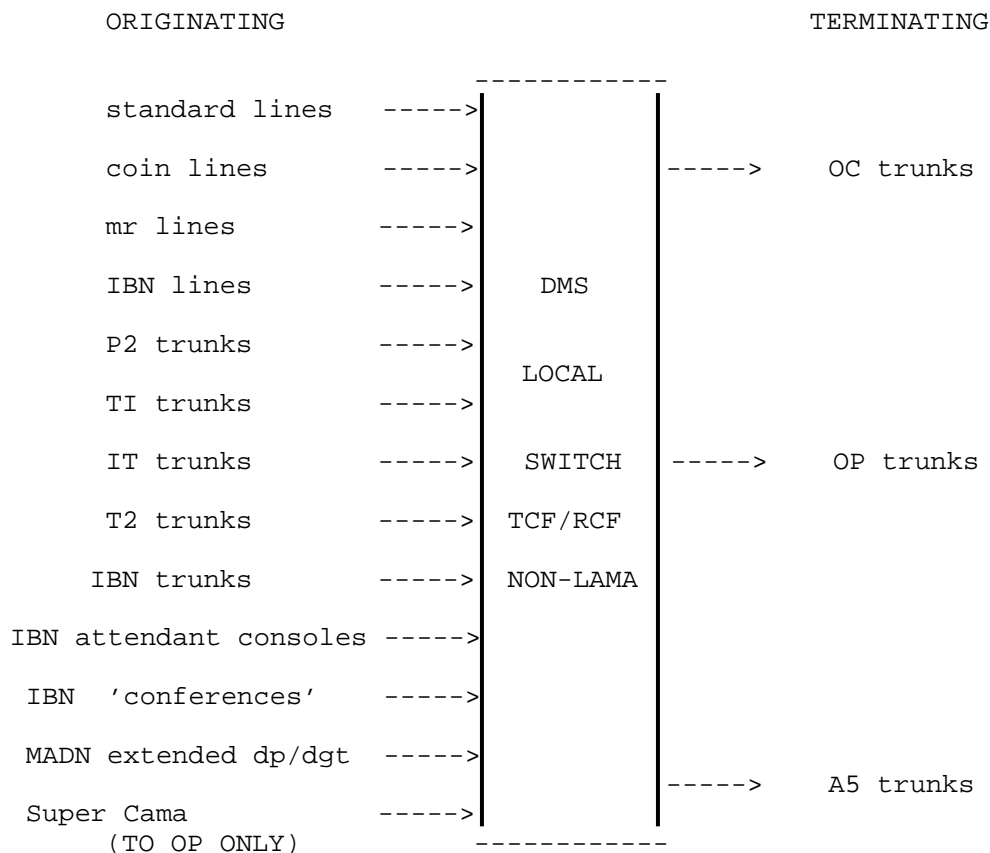
- i - OC
- ii - A5
- iii - OP

The following originators will be supported in going to a trunk which has a WINK ANI request:

- i - standard lines
- ii - coin lines
- iii - message rate lines
- iv - IBN lines
- v - P2 trunks
- vi - TI trunks
- vii - T2 trunks
- viii - IT trunks
- ix - IBN trunks
- x - IBN attendant consoles
- xi - MADN extended dp/dgt line
- xii - Super Cama (SC) **** TO OP ONLY *****
- xiii - IBN meet me conference
- xiv - IBN attendant conference

- xv - IBN preset conference
- xvi - IBN flexible station controlled conference

This diagram illustrates the originators which can call an RCF number and get forwarded to a trunk which supports a WINK ANI request.



To support a WINK ANI request on OP trunks a new field will be provided in table TRKGRP for the OP trunk refinement. The new field ANITYPE can be datafilled with REV(reversal) or WK(wink). The standard default for this field is REV. Trunk types OC and A5 already support WINK ANI requests.

The ANI spill format for A5 trunks is different than the ANI spill for OC type trunks. When doing a test call from the ttp appropriate ANI spill must be given. To do this a new office parm called TEST_CALL_ AMR_SPILL will be created. This parm will live in table OFCVAR and will appear in all offices with A5 or OSC trunks.

This item is not actually part of this feature but is a need which has been recognized.

(c) OPERATOR VERIFICATION CALLS

LSSGR FSD 01-02-1402 states that operator busy verification calls

should receive busy treatment, RCF calls will be changed to meet this specification.

(d) TRAFFIC MEASUREMENTS

The following measurements are needed for the RCF feature:

1. Peg count event of calls to be forwarded - This count will be all calls offered for forwarding.
2. Usage count, 100 call second(CCS) usage scan of RCF calls in progress
3. Deflected count for calls not forwarded - This count will be comprised of calls which are not forwarded for the following reasons:
 - i - originator is a test facility
 - ii - maximum number of calls allowed reached
 - iii - block toll completing calls in effect
 - iv - no service circuit (cfw extension block)
 - v - maximum cfw chain size reached
 - vi - operator busy verification call

These traffic measurements will be provided on a per office basis and will also be provided on the first 127 telco assigned RCF d.n.s.

A new OM group(RCF) will be created which will encompass the traffic measurements mentioned here.

(e) ROUTING ON COMBINED TRUNK GROUPS

The ability to route over combined trunk groups already exists for calls originating from a line in the same office. The ANI fail treatment will be the same as for the entire group. For calls originating from incoming trunks those routing to an OP or an OC type trunk currently meet the above requirement. Trunk type A5 will be given this ability with this feature.

It's important to note that the trunk group should have a WINK ANI request to ensure that true answer supervision is used.

It's up to the other office to handle RCF/TCF and CAMA traffic on the same group. DMS200 offices have this capability.

OPTIONALITY

- the wink ANI request capability on OP trunks will appear in all offices which support OP trunks
- the OMs will be allocated in an optional subsystem

Package	NTX021AA04 REMOTE CALL FORWARDING
Feature set	REMOTE CALL FORWARDING
Feature	MESSAGE RATE REMOTE CALL FORWARDING BASE DN
Feature no	F2815

FEATURE SYNOPSIS

This feature provides Multi-Unit Message Rate (MUMR) Bellcore AMA records for Remote Call Forwarding (RCF) subscribers.

FEATURE DESCRIPTION

This feature adds MUMR billing to RCF directory numbers by allowing a line attribute index to be supplied for an RCF DN just as if it were a regular line.

Datafilling the RCF DN for MUMR is done by specifying a line attribute with the new line class code of Virtual Line (VLN) and a valid Message Rate Service Area (MRSA). All RCF lines must use the new line class code VLN.

Ref:

FDOC BR0815
FSD 01-02-1402 Remote Call Forwarding

NTX023AB03 Status: RTM REMOTE LINE MODULE (RLM)

MAINTENANCE AND TESTING	:	
LINE TESTING USING LTU		F0700
DCM-R DIAGNOSTIC		F0706
RLM MAINTENANCE		F0707
INTERFACES	:	
RLM - INTERFACE WITH	BADGER 612A	F0716
RLM - INTERFACE WITH	#3 LTC	F0717
VARIABLE QUANTITIES OF T1 LINE		F0719
SERVICES	:	
REMOTE LINES WITH	HOST OFFICE FEATURES	F0720
SWITCHING AND TRANSLATION	:	
BASIC TRANSLATION AND ROUTING		F0722
SIGNALING AND SUPERVISION	:	
SIGNALLING CHANNEL SUPERVISION		F1197

Package	NTX023AB03 REMOTE LINE MODULE (RLM)
Feature set	MAINTENANCE AND TESTING
Feature	LINE TESTING USING LTU
Feature no	F0700

DESCRIPTION

RLM subscriber line testing methods and interfaces are no different than those used for LM subscriber's at the host DMS, namely:

- a. Subscriber line testing from a Repair Service Bureau (RSB).
- b. Use of the LTP to perform the tests.

- a. Subscriber Line Testing from an RSB

(#14 LTD; CARLS, or equivalent)

- (i) The RSB is within metallic range i.e. the RLM maximum loop resistance between the RSB and the RLM is less than 1500 ohms.

A test trunk interfaces the RSB to the RLM site Remote Service Module. A maintenance craftsman from the RSB, seizes the test trunk, and outpulses the subscriber NXX number. The DMS recognises that testing to a specific subscriber is requested and the T, R, of the subscriber is connected to the RSB. External ringing boosters associated with the test trunk at the RLM site are provisioned if the metallic resistance to the RSB is greater than 300 ohms. The same configuration can also interface a #3 LTC or equivalent.

- (ii) The RSB is beyond the 1500 ohm metallic range limit; refer to package NTX027AA.

- b. Subscriber Line Testing Using LTP

All testing functions done to host lines can also be done to remote lines. For more details, refer to Line Test Position (LTP) Package.

Package	NTX023AB03 REMOTE LINE MODULE (RLM)
Feature set	MAINTENANCE AND TESTING
Feature	DCM-R DIAGNOSTIC
Feature no	F0706

DESCRIPTION

The DCM required to interface an RLM is a modified version of a standard DCM. The modifications are required to provide:

- HDLC based common channel signalling
- A&B bit suppression

DCM-R diagnostic performs the standard DCM diagnostics and the following:

- T1 maintenance
- HDLC maintenance
- Reswitch HDLC over secondary T1 link
- DCM-R diagnostics

Package	NTX023AB03 REMOTE LINE MODULE (RLM)
Feature set	MAINTENANCE AND TESTING
Feature	RLM MAINTENANCE
Feature no	F0707

DESCRIPTION

The RLM maintenance will comprise of all the aspects associated with the LM base plus additional maintenance diagnostics to handle:

- HDLC functions including switchover
- DS-1 facilities to a DCM
- Local LTU and alarm circuit packs
- Remote service module maintenance

Package	NTX023AB03 REMOTE LINE MODULE (RLM)		
Feature set	INTERFACES		
Feature	RLM - INTERFACE WITH	BADGER	612A
Feature no	F0716		

DESCRIPTION

Badger 612A is interfaced to the RLM via the metallic access. For more details, refer to Line Testing using metallic access feature in the same package.

Package	NTX023AB03 REMOTE LINE MODULE (RLM)		
Feature set	INTERFACES		
Feature	RLM - INTERFACE WITH		#3 LTC
Feature no	F0717		

DESCRIPTION

#3 LTC is interfaced to the RLM via the metallic access. For more details, refer to Line Testing using metallic access feature in the same package.

Package	NTX023AB03 REMOTE LINE MODULE (RLM)
Feature set	INTERFACES
Feature	VARIABLE QUANTITIES OF T1 LINE
Feature no	F0719

DESCRIPTION

Depending on traffic requirement, up to 4 DS-1 links per RLM controller can be used between host and RLM's.

Package	NTX023AB03 REMOTE LINE MODULE (RLM)		
Feature set	SERVICES		
Feature	REMOTE LINES WITH	HOST OFFICE FEATURES	
Feature no	F0720		

DESCRIPTION

The Remote Line Module (RLM) is essentially a Line Module (LM) operating in a location remote to the controlling DMS-100 host office via DS-1 links. RLM's can be located, currently, up to 80 km from the host office.

Subscribers connected to the RLM will have available to them the same subscriber line feature set as that available to subscribers connected to a Line Module co-located with the DMS host office.

The RLM size range is from 100 lines up to 1280 lines interfacing with from 2 to 8 DS-1 links. One or more RLM's can be equipped at any one site with the size dependent on traffic requirements and the exhaust size of the host office.

Each RLM group (of up to 5 RLM's at a particular site) is supported by a third single bay frame that mounts a Remote Service Module. This Module provides maintenance, alarm and DIGITONE receiver operation for the RLM group. An RLM provisioned with an RSM can support a maximum of 1216 subscriber lines.

A typical RLM layout occupies two standard DMS-100 single bay frames measuring 86"H x 27"W x 18"D (2184 mm x 686 mm x 467 mm) comprising the RLM and a third single bay frame, the Remote Service Equipment bay that mounts the Remote Service Module.

Note: For the ESA feature, one RSM is required per RLM in that site equipped with Digitone Receivers and any other service circuit as required.

Package	NTX023AB03 REMOTE LINE MODULE (RLM)
Feature set	SWITCHING AND TRANSLATION
Feature	BASIC TRANSLATION AND ROUTING
Feature no	F0722

DESCRIPTION

Subscribers dialing from an RLM will be treated in the same way as host subscribers as far as translation and routing are concerned. Calls will be analysed and treated by the host.

Package	NTX023AB03 REMOTE LINE MODULE (RLM)
Feature set	SIGNALING AND SUPERVISION
Feature	SIGNALLING CHANNEL SUPERVISION
Feature no	F1197

DESCRIPTION

SIGNALLING BETWEEN THE HOST AND THE RLM IS ACHIEVED THROUGH A DEDICATED 64 KBIT/S TIME SLOT (PER CONTROLLER) OVER THE DS-1 LINKS - USING HDLC PROTOCOL. DUPLICATED SIGNALLING SLOTS ARE PROVIDED PER CONTROLLER, ONE IS ACTIVE, AND THE SECOND (ON ANOTHER DS-1 LINK, PREFERABLY DIVERSELY ROUTED) IS DESIGNATED ACTIVE STANDBY.

THREE TYPES OF MESSAGES ARE HANDLED THROUGH THE SIGNALLING LINKS.

- DMS 100 I/O SYSTEM MESSAGES
- DMS 100 CHANNEL SUPERVISION MESSAGES (PP-PP MESSAGES)
- SPECIAL DCM - RLM MESSAGES

Package	NTX024AA01 RLM	INTRA-RLM CALLING
Feature set	RLM	
Feature	RLM-INTRA CALLING FOR POTS CALLS	
Feature no	F0475	

DESCRIPTION

THIS FEATURE PROVIDES FOR INTRA AND INTER-BAY CALLING, WITHIN THE SAME RLM, WITHOUT UTILIZATION OF THE DS-1 LINKS TO THE HOST OFFICES EXCEPT DURING THE CALL SETUP STAGE.

INITIAL CALL SET-UP IS PERFORMED VIA T1 LINKS CONNECTING THE RLM TO THE HOST OFFICE UP TO THE POINT OF CALLED PARTY ANSWER. UPON THE CONDITION OF AVAILABLE INTER/INTRA BAY CHANNELS, THE INTRA RLM CALL IS RE-SWITCHED TO THE AVAILABLE LOCAL LINK. THE INTRA BAY LINK PROVIDES THE BASIC CAPABILITY OF ESTABLISHING 12 CONNECTIONS PER BAY. THIS CAPABILITY CAN BE EXTENDED TO PROVIDE AN ADDITIONAL 12 CONNECTIONS PER INTRA BAY LINK AT THE EXPENSE OF INTER BAY AND DS-1 LINKS TO THE HOST OFFICE.

AN INTER BAY LINK PROVIDES THE CAPABILITY OF ESTABLISHING 24 INTER BAY CONNECTIONS. THE INTER BAY LINK IS IMPLEMENTED AT THE EXPENSE OF DS-1 LINKS TO THE HOST, BY PHYSICALLY LOOPING THE DS-1 LINKS BETWEEN CONTROLLER "0" AND CONTROLLER "1" OF THE DOUBLE BAY RLM. WHEN ALL INTRA SWITCHING LINKS ARE BUSY OR WHEN THE INTRA SWITCHING FUNCTION IS OUT OF SERVICE, INTRA RLM CALLS WILL BE ESTABLISHED IN THE NORMAL MANNER UTILIZING THE DS-1 LINKS TO THE HOST.

NTX025AA02

Status: RTM RLM EMERGENCY STAND-ALONE OPERATION

RLM

:

EMERGENCY OPERATION

F0477

ABBREVIATED DIALLING IN ESA MODE

F3343

Package	NTX025AA02 RLM	EMERGENCY STAND-ALONE OPERATION
Feature set	RLM	
Feature	EMERGENCY OPERATION	
Feature no	F0477	

DESCRIPTION

In the event of a complete failure of the DS-1 links (carrying the signaling channels) between RLM ontrollers and the host office DCM-R's, the ESA optional feature will enable the RLM to provide POTS service between the subscribers it serves.

The following will be supported by ESA:

a) ESA - 7 Digit Calling to Subscribers in the same RLM

A subscriber in RLM which is in ESA mode will be able to establish calls to other subscribers serviced by the same RLM frame, by dialing their 7 digit directory number.

Maximum number of simultaneous calls is 52.

Notes:

- 1) The basic package services the following line types:
 - a) one-party
 - b) two-party
 - c) multi-party (incl. of 4 party fully, 8 party semi-selective)
 - d) coin phones (for treatment see "ESA - Coin Phone Originating" feature)
- 2) Standard call progress tones are generated.
dial tone, audible ring, busy and overflow
- 3) No ROH or announcements in PSPD.
- 4) The basic package includes the following line features:
 - a) DP and DT pulsing (provided that DT receiver card is resident in service shelf)
 - b) Ringing as under host control for non-revertive calls
 - c) loop start and ground start
- 5) The basic package does not provide, among others:

- a) custom calling
- b) centrex calling
- c) 911 ringdown trunks

- 6) The basic package can accommodate up to 16 thousand groups of DN's.
- 7) For treatment of revertive calls, refer to ESA - revertive calling.

b) ESA - Calling to Special Directory Numbers (SDN)

For each RLM with ESA option, Telco can define a set (maximum 16 members) of special directory numbers/prefixes of 1 to 14 digits. When in ESA mode, calls to these numbers (or with these prefixes) will be routed to Telco defined line appearances (in the same RLM).

Standard treatment will be given to calls to these special directory numbers (i.e. no queuing if line busy, etc.).

c) ESA - Calls Outside RLM/Special Directory Numbers

Subscriber that dialed a DN that does not reside in the RLM and does not belong to special directory number group will receive overflow tone.

d) ESA - Coin Phone Originating Calls

Coin will be refunded (or more exactly, a single attempt will be made to refund the coin) on all calls that originated from a coin phone.

e) ESA - Automatic Subscribers Data Update

Subscriber data resident in ESA controller will be updated automatically every 24 hours (if ESA RLM is under host control).

It will not be updated on individual service orders, thus the data can be up to 24 hours out of date.

If the data link T1 lines fail during the daily update period (expected duration two minutes) then it will be impossible to activate ESA operation.

f) ESA - Revertive Calling

A subscriber on ESA RLM equipped with this option will be able to make revertive calls. The following simplified treatment will be given to the two parties:

- 1) Called party:
 - a) Ringing: as usual.
 - b) After going off-hook: a burst of audible ring tone to indicate that this is a revertive call.
- 2) Calling party:
 - a) After dialing: busy tone (the calling party must then go on-hook in order to ring the terminator).
 - b) While the called party is rung: no ringing is supplied to the calling party (unless the ringing of called happens to also ring the phone of calling party).
 - c) If the calling party goes off-hook before the called party: burst of audible ring tone. (NB: going on-hook again terminates the call).

g) ESA - Hunting Modes

Three modes of hunting will be offered in ESA mode:

- 1) multi-line hunting
- 2) directory number hunting
- 3) sequential directory number hunting

Note:

- 1) Maximum number of hunt groups is limited to 20.
- 2) Maximum 20 members in a hunt group.
- 3) Only sequential hunting is provided (no circular hunt).

h) ESA - Automatic Lines

In ESA mode of operation, the RLM will be able to service automatic lines. Upon automatic line origination, ESA control will attempt to establish a call to the same directory number as under host control. If the terminator is not in the same RLM frame, the originating automatic line will receive the overflow tone.

Note:

1) The number of automatic lines is limited to maximum of 20 (per RLM frame).

i) ESA - Translation Specifications

1) Directory number translation

- a) Maximum 1800 seven-digit directory numbers
- b) Maximum 16 thousand groups
- c) 1216 terminals in own and mate bay
- d) 16 prefix and special (emergency) number, up to 14 digits each, all routed to pre-defined terminations, e.g. "0", "1", "411", "611", "911", "01+", NXX-XXXX, NPA-NXX-XXXX

2) Switching

Calls originate and/or terminate in own/mate bay.

3) Line classes

- a) single party
- b) two party
- c) multi party
- d) coin line
- e) automatic lines (20 lines)

4) Origination

- a) DP, DT/DP origination
- b) loop start
- c) ground start

5) Termination

- a) revertive calling

6) Ringing

All ringing schemes offered by RLM.

7) Hunt groups

- a) multi line hunt groups
- b) directory number hunt groups
- c) sequential directory hunt groups
- d) maximum 20 hunt groups
- e) maximum 20 members in a hunt group
- f) sequential hunting is used (no circular hunt)

8) Present restrictions

- a) no business features, e.g. no flash privilege
- b) sleeve leads are not handled

j) ESA - Activation

ESA mode of control will be activated if the message links from central control to both controllers of the ESA RLM are inoperative.

Note:

- 1) Calls in progress at the instant of activation will be terminated.
- 2) Manual activation is possible by removing DS-1 interface packs in DCM.

k) ESA - Deactivation

ESA mode of control will be deactivated only if the message link between CC and at least one RLM controller resumes operation.

Note:

- 1) Calls in progress at the instant of ESA deactivation will be terminated.
- 2) Depending on the circumstances, the RLM pair may return to host control in either normal (both controllers active) or takeover (one controller servicing both bays) mode.

Package	NTX025AA02 RLM	EMERGENCY STAND-ALONE OPERATION
Feature set	RLM	
Feature	ABBREVIATED DIALLING IN ESA MODE	
Feature no	F3343	

FUNCTIONAL DESCRIPTION

Currently, only seven digit dialling is allowed when an RLM is operating in Emergency Stand Alone (ESA) mode. This feature proposes to make some code changes to allow abbreviated dialling (dialling from 3 to 7 digits to complete a call to another line) in ESA mode. This will be especially useful in places such as the Bahamas and the Barbadoes where dn s are of less than seven digits.

Abbreviated dialling would allow telcoes which support dn s of less than seven digits to have their RLMs in ESA mode behave in the same way as does the standard CC translation.

The CC presently loads tables into the RLMs to allow the ESA translations to occur. What is proposed is to also load an additional five bytes: two bytes of filler digits, two bytes of address information, and one byte to indicate how many digits must be dialled, whenever the tables are loaded.

The filler digits will be described by an entry in table lminv, and the values to be sent to the rlm will be calculated from the inputted digits. The entry will be a selectorized field that will only be prompted for when the boolean ESA is set to false. The number of digits to dial in the RLM ESA mode will be calculated from the number of prefix digits inputted.

It should be remembered that this change will not be reflected in the RLM until the new ESA information is loaded.

The above mentioned field in table lminv will be called:

DIGITS

and will only be prompted for when the rlm is equipped with the ESA feature.

NTX030BA03 Status: RTM TOPS ACD FEATURES

MAINTENANCE AND TESTING	:	
REMOTE TOPS MAINTENANCE		F0542
ADMINISTRATION	:	
EXTENDED OPERATOR FEEDBACK DATA (BREAKDOWN BY CALL TYPE)		F0545
MULTI-TRAFFIC OFFICE OPERATION		F0548
TRAFFIC SAMPLING		F0554
SINGLE TRAFFIC OFF. OPERATION BASIC OPERATOR FEEDBACK		F1006
MECHANIZED FORCE ADMINISTRATION DATA SYSTEM (MFADS)		F1113
ASSIGNABLE GRADE OF SERVICE		F2286
POSITION OCCUPANCY MEASUREMENT		F2328
15 MINUTE REPORTS FOR MFADS		F2812
OPERATOR SERVICES	:	
TOPS BILINGUAL MMI FOR DEVICES		F7145

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	EXTENDED OPERATOR FEEDBACK DATA (BREAKDOWN BY CALL
Feature no	F0545

DESCRIPTION

DMS TOPS simple operator feedback system enables each operator to obtain, on request, her performance in the form of IPS (Initial Position Seizures) and AWT (Actual Work Time) per call, irrespective of the type of calls.

In the extended operator feedback system, the system or traffic manager can assign a certain number of work study registers (to be input as Office Parameters) to operators and obtain performance data per call type.

The Traffic Office Manager will have the capability of clearing expanded operator feedback registers from the Traffic Office Manager's TTY at the time registers are reassigned.

TOM TTY input commands for control of expanded operator feedback are shown below:

1. Assign operator numbers to the expanded operator feedback system.
2. Request a listing of operator numbers assigned to the expanded operator feedback system.
3. Disassociate operator numbers from the expanded operator feedback system. (This input command will also result in a Traffic Office TTY Output report of so far accumulated expanded operator feedback data for the specified operator number).

The Force Manager can query the number of expanded feedback registers in use.

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	MULTI-TRAFFIC OFFICE OPERATION
Feature no	F0548

DESCRIPTION

Multi traffic office operation permits splitting a large operator force into a number of smaller traffic offices for the purpose of administration. Traffic offices may be located remotely to take advantage of favourable accommodations, labour supply, etc.

The TOPS multi traffic office administration system augments the normal single traffic office administration position with a Force Management (FM) CRT monitor and Force Administration Data terminal (FADS).

The CRT monitor will display status data for each traffic office and the total force. The FADS terminal provides traffic data at 30 minutes (or 15 minutes if requested) interval and the capability query status, input broadcast messages etc. The data is similar to that provided by the FADS terminals in each traffic office except that it pertains to the whole force.

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	TRAFFIC SAMPLING
Feature no	F0554

DESCRIPTION

The traffic sampling feature provides information on the flow of calls through TOPS. Three software registers provide a "1 of N" fraction for weekday, Saturday and Sunday. 1 of N calls are flagged on the AMA tape. If an AMA entry would not normally be required, it will be made with a Traffic Sampled, no charge indication for the purpose of sampling. The flagged calls on AMA tape will form a data base for downstream statistical analysis for the purpose of:

- Operator services work volume measurement plan
- Division of revenue procedures
- Customer dialing acceptance analysis
- Engineering studies

The "N" factor for sampling of calls is selected and controlled by Telephone Company Traffic Staff.

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	SINGLE TRAFFIC OFF. OPERATION BASIC OPERATOR FEEDB
Feature no	F1006

SEE FEATURE NUMBER F0994

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	MECHANIZED FORCE ADMINISTRATION DATA SYSTEM (MFADS
Feature no	F1113

DESCRIPTION

The Mechanized Force Administration Data System is a mini-computer system which extracts force management operational measurements from a pollable port in TOPS every half-hour. The data output is triggered by receipt of a unique pair of ASCII characters sent by the mini-computer. The mini-computer returns service and force summaries, as well as projections of operators required, to TOPS force managers.

The MFADS port is implemented as a TOPS device. The port is a trunk connected via the network to a TOPS digital modem. The mini-computer sends a two character polling ID to the port in order to initiate a dump. The TOPS device collects these characters from the digital modem and compares them to OFCVAR PARM 'TOPS_MFADS_POLLING_ID'. If there is a match the device will then begin sending the force data to the mini-computer. The MFADS is treated like any other TOPS device in the TTP level of the MAP.

The following force management operational measurements will be retrieved:

- a) Number of IPS for each Traffic Office.
- b) Occupied position usage: register contents for each Traffic Office.
- c) Work Volume usage: register contents for each Traffic Office.
- d) Calls waiting usage: register contents for the TOPS as an entity.
- e) Number of scans for the half-hour for TOPS as an entity.
- f) IPS, Work Volume usage and Occupied position usage for TOPS as an entity.
- g) Work Volume usage by call type for each Traffic Office and for TOPS as an entity.

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	ASSIGNABLE GRADE OF SERVICE
Feature no	F2286

FEATURE SYNOPSIS

This feature increases the number of call waiting queues from one to seven. Each queue handles a different call class. The Telephone Company can assign the grade of service for each queue. Each call will be given priority treatment depending on call class, grade of service assignment and length of time in queue. This feature provides a reasonable average answer time for all call types while providing preferential treatment to Recalls and CAMA calls.

FEATURE DESCRIPTION

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	POSITION OCCUPANCY MEASUREMENT
Feature no	F2328

FEATURE SYNOPSIS

This feature adds another statistic called %OCC to the existing statistics of the Force Management (FM) periodic reports FM15 and FM30. %OCC is the position occupancy measurement given as a percentage. It is the quotient of work volume (WV) in CCS over the average occupied positions (AOP). It appears in the printout after AOP.

FEATURE DESCRIPTION

With this feature, the headers of the FM15/FM30 printout are as follows:

IPS WV-CCS AWT AOP %OCC

%OCC is not displayed if package NTX32AC is not ordered.

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	ADMINISTRATION
Feature	15 MINUTE REPORTS FOR MFADS
Feature no	F2812

FEATURE SYNOPSIS

This feature allows the mechanized force administration data system (MFADS) to extract the traffic operator position system (TOPS) force management (FM) statistics at intervals of 15 minutes or 30 minutes. The 15 minute report is added to provide the operating companies with greater resolution of the TOPS FM statistics.

FEATURE DESCRIPTION

MFADS is a mini-computer system which extracts FM statistics from a pollable port in TOPS. The data output is triggered by receipt of a unique pair of ASCII characters sent by the mini computer. The mini computer returns service and force management summaries, as well as projections of operators required to TOPS force managers.

This feature makes it optional for MFADS to poll for FM statistics every 15 minutes or every 30 minutes. The MFADS period is selected as 15 or 30 minutes by initialization of a new engineered office parameter table (OFCENG) variable TOPS_MFADS_PERIOD.

If a 15 minutes period is selected, FM statistics are returned to MFADS for the 15 minute period previous to the 15 minute period of the request. For example, if FM statistics are requested at 20 minutes after the hour, the statistics sent to MFADS are the measurements accumulated during the first fifteen minutes of the hour.

For a 30 minute period, the MFADS feature will continue to function as before. If a 30 minute period is selected, FM statistics are returned to MFADS for the previous 30 minute period, provided the request occurs within 14 minutes of the 30 minute period. If the request does not occur within 14 minutes, FM statistics are not returned. For example, if FM statistics are requested at 36 minutes after the hour, the statistics sent to MFADS are the measurements made during the first 30 minutes of the hour. However, if FM statistics are requested at 50 minutes after the hour, FM statistics are not returned.

Ref: BR0812

Package	NTX030BA03 TOPS ACD FEATURES
Feature set	OPERATOR SERVICES
Feature	TOPS BILINGUAL MMI FOR DEVICES
Feature no	F7145

FEATURE SYNOPSIS

This feature expands MMI for TOPS I/O devices from English to optionally English or French for entering commands and displaying messages. TOPS positions are already bilingual.

FEATURE DESCRIPTION

The purpose of this feature is to provide bilingual input and output on the TOPS devices. This makes the TOPS system bilingual, since French displays are already available at operator positions.

Bilingual output on TOPS positions is made possible by a switch in the controller. This allows individual positions to be designated as either French or English.

It has been assumed that the reader of this document is familiar with the TOPS force management system. No attempt has been made to explain the commands or to analyze the output. There have been no changes made to the force management commands or the report outputs except to provide them in French. Some of the information included in the input and output may be as a result of optional features and will require activation to appear.

Ref: AG0721

NTX030CC10 Status: RTM TOPS CALL PROCESSING FEATURES (UPG. OF N

SWITCHING AND TRANSLATION	:		
DIRECT DIAL OVERSEAS (DDO)			F0536
RATING SYSTEM	:		
OVERSEAS RATING			F0537
ADMINISTRATION	:		
INTERPOSITION TRANSFER			F0538
SWITCHING AND TRANSLATION	:		
MOBILE HANDLING		ITMS ROAMER	F0539
TOPS	:		
AUTOQUOTE PRINTERS			F0551
HOTEL ADMINISTRATION SYSTEM (HADS)			F0552
DIRECTORY ASSISTANCE HANDLING			F0557
CALLS CONNECTED TO A TOPS POS. :			
NON-COIN 0+, 0-			F0930
OPERATOR NUMBER IDENTIFICATION (ONI) CALLS			F0931
COIN 1+, 0+, 0-			F0932
HOTEL 1+, 0+, 0-			F0933
SERVICE CODE		121 (INWARD)	F0935
SERVICE CODE		181	F0936
SERVICE CODE		1150	F0937
SERVICE CODE		1155	F0938
SERVICE CODE		1156	F0939
SERVICE CODE		1158	F0940
SERVICE CODE		1159	F0941
STATION CLASS & CALL TYPE	:		
PREFIX DIGIT			F0942
4 - SECOND TIMEOUT ON 0+ CALLS			F0943
tone IDENTIFICATION OF ONI/ANIF CALLS			F0944
IDENTIFICATION OF:		ALARMS, ANI ID 8	F0945
IDENTIFICATION OF:		INTERCEPT, ANI ID 9	F0946
IDENTIFICATION OF:		TRK CLASS HOTEL/MOTEL CALLS	F0947
IDENTIFICATION OF TRUNK CLASS SENT-PAID RESTRICTED CALLS			F0948
BILLING TYPES	:		
STATION TO STATION			F0949
PERSON TO PERSON			F0950
AUTOMATIC COLLECT			F0951
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SWITCHING AND TRANSLATIONS :
EXPANDED FXDNMAP

G0007

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	RATING SYSTEM
Feature	OVERSEAS RATING
Feature no	F0537

DESCRIPTION

The DMS TOPS automatic rating system is in two subsystems - Domestic and Overseas.

The Domestic rating system is detailed in NTX030AA package. In the overseas rating system, the charge for overseas calls is determined from information stored in memory including:

- dialled country code
- originating NPA
- day of week
- time of day
- taxes
- initial or overtime period
- person-to-person or station-to-station call.

In addition it is possible to specify the number of minutes of overtime on coin calls before the customer will be recalled to collect overtime charges.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	INTERPOSITION TRANSFER
Feature no	F0538

DESCRIPTION

If the operator has received a call she/he is unable to handle (e.g. language difficulties) the call can be transferred to a special group of operators which is equipped to handle this type of call. Two transfer keys one provided for this purpose.

If these calls can be identified as coming in over a specific trunk group, all calls originated from this trunk group can be identified to the operator by the display of the calling number or the NPANXX if the call is ONI. Normally the display of this information requires the use of the Call Details key.

A transferred call will be identified as such to the operator. The Force Manager will have the capability to activate or deactivate the transfer feature.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)		
Feature set	SWITCHING AND TRANSLATION		
Feature	MOBILE HANDLING	ITMS ROAMER	
Feature no	F0539		

DESCRIPTION

The interface between the DMS-TOPS and the mobile equipment is a standard loop or E&M trunk (MF or DP).

When a mobile call comes in it is routed directly to an operator position. Mobile and CLG # are displayed on screen. Operator asks for calling number. There are 2 types of mobile: Manual and IMTS. Manual mobile calling number is of the form YJ + 5 digits. YJ has to be translated by the operator to a 2 digit code. IMTS mobile calling is 7 digits. In both cases operator keys: KP BACK + 7 digits + START. Call proceeds normally afterwards except that manual mobile calls must be held on loop because calling supervision is not provided. Operator must periodically access loop and check that conversation is in progress.

Operator receives a request to complete a mobile telephone. If it is manual mobile then the operator must translate 2 letters to 2 digit code. IMTS mobile is seven digits already. Operator keys: KP FWD + 7 digits + START. Call proceeds normally afterwards except that manual mobile calls must be held on loop because called supervision is not provided. Operator must periodically access loop and check that conversation is in progress.

Mobile call comes to operator position from a mobile telephone registered outside the operator's serving area. Calling number input by operator is a special number which flags this type of call for downstream processing. If the call is station paid or person paid, then the operator should key STA SPL CLG or PER SPL CLG and KP SPL + CALLING NUMBER + START. Call proceeds normally afterwards except that manual mobile calls must be held on loop because calling supervision is not provided. Operator must periodically access loop and check that conversation is in progress.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	TOPS
Feature	AUTOQUOTE PRINTERS
Feature no	F0551

DESCRIPTION

Autoquote printers are printers situated at the hotel.

At termination of a hotel call the details auto-quoted to the hotel are as follows:

- (a) System serial number from 0001 - 9999.
- (b) A three letter hotel acronym followed by a cyclic message counter numbered sequentially from 001 to 999.
- (c) Called number. Overseas.
- (d) Date
- (e) Connect time in hours and minutes.
- (f) Call duration in minutes.
- (g) Charges if a paid call.
- (h) Taxes
- (i) Room number
- (j) Name

In the event of hotel TTY failure (no paper, power off etc.) the auto-quote messages will be queued for a maximum period of 10 minutes. If the TTY is not returned to service in 10 minutes the queued messages and all subsequent messages will be dumped onto the Voice-Quote TTY.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	TOPS
Feature	HOTEL ADMINISTRATION SYSTEM (HADS)
Feature no	F0552

DESCRIPTION

A Hotel Administration (HADS) terminal on telephone company premises provides the following capabilities:

- Printout of alarm messages received from remote printers.
- Interrogation of the status office remote printers.
- Input of call details to the remote printer which were recorded on the voice quote printer because the hotel printer was out of service.
- Input of call details to the remote printer for calls processed by non TOPS operators (e.g. mobile, conference, overseas operator SOST).

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	TOPS
Feature	DIRECTORY ASSISTANCE HANDLING
Feature no	F0557

DESCRIPTION

When a call originates on a TOPS trunk group with a called number of 411, translations can handle the call in one of two ways:

1. Call may be routed to an outgoing trunk group terminating on service desks.
2. Call may be routed to an operator position.

DA and supervision are displayed on operator position screen. No AMA may be displayed if telco has decided not to charge for directory assistance or if call originated from coin phone or hotel. CLG # may be displayed if call is ONI or ANI Fail. CT1 or CT2 may be displayed if telco has decided to limit directory assistance calls to certain operators only. At the end of the call, operator keys: CAN CALL, POS PLS to get rid of the call.

The following is the sequence of events when 411 call is routed to operator position:

1. Call comes in.
2. When call is sent to operator position:
 - a) No AMA field is set according to table TOPS and depending on whether this is coin or hotel origination.
 - b) No AMA is displayed if no AMA is set.
 - c) CLG # is displayed if this is an ONI call.
 - d) CLG # is flashed if this is an ANI fail call.
 - e) CT1 or CT2 is displayed if call transfer field is not general.
3. When operator keys: CAN CALL, POS RLS Operator position call process:
 - a) Disconnects calling party from operator position conference port 1
 - b) Idles calling party

- c) Disconnects operator position conference port 0 from operator position voice terminal
- d) The 3 PCC is then idled.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALLS CONNECTED TO A TOPS POS.
Feature	NON-COIN 0+, 0-
Feature no	F0930

DESCRIPTION

Non-coin subscribers dial "0" only when operator assistance is required. Information on called number, type of service (station, person to person) and billing type is obtained verbally. The calling number may be obtained verbally or from the calling exchange ANI equipment. The operator keys in all pertinent information into the DMS system which takes over supervision and billing functions.

Non-coin subscribers dial "0" followed by the called numbers for "premium" calls. The operator obtains verbally information on the type of service and billing type and keys it into the system. The DMS takes over supervision and billing functions.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALLS CONNECTED TO A TOPS POS.
Feature	OPERATOR NUMBER IDENTIFICATION (ONI) CALLS
Feature no	F0931

DESCRIPTION

TOPS handles calls requiring operator number identification. The operator keys in the verbally obtained number. In the case of ANI failure, the operator will be alerted by a flashing display.

ONI is the method used to identify the calling number when the end offices are not equipped with ANI or when the end offices are not able to identify automatically the calling number (multiparty line for example).

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALLS CONNECTED TO A TOPS POS.
Feature	COIN 1+, 0+, 0-
Feature no	F0932

DESCRIPTION

Toll Calls (1+, 0+, 0-) originated from coin stations are routed to the operator for quotation of initial and overtime charges and coin deposit supervision. In addition to manual coin control keys provided on the keyboard, the system provides automatic coin collection on disconnect.

For more details, refer to coin features dscription in the same package.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALLS CONNECTED TO A TOPS POS.
Feature	HOTEL 1+, 0+, 0-
Feature no	F0933

DESCRIPTION

Toll calls (1+, 0+, 0-) originated from hotel guests are routed to the operator who requests the caller's name and room number and keys into the system.

Particulars of the call (name, room number, called party, time and charges) are printed out on a printer at the conclusion of the call. A dedicated printer (autoquote) may be located on the hotel premises. Otherwise the information is verbally transmitted to the hotel staff by the time and charge clerk (voice quote).

For more details, refer to Hotel features in the same package.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)		
Feature set	CALLS CONNECTED TO A TOPS POS.		
Feature	SERVICE CODE	121 (INWARD)	
Feature no	F0935		

DESCRIPTION

The following intertoll or service code calls are handled by TOPS operators.

- 121 inward
- 181 toll station
- 1150 universal or coin call back
- 1155 time and charge call back
- 1156 hotel call back
- 1158 and 1159

For outgoing calls, the operator dials the special codes enabling the system to select an appropriate route. Outpulsing, if any, is under control of the DMS digit analysis system. Incoming calls offered to the operator will be accompanied by an appropriate display identifying the type of call.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	CALLS CONNECTED TO A TOPS POS.		
Feature	SERVICE CODE	181	
Feature no	F0936		

SEE FEATURE NUMBER F0935

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	CALLS CONNECTED TO A TOPS POS.		
Feature	SERVICE CODE	1150	
Feature no	F0937		

SEE FEATURE NUMBER F0935

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	CALLS CONNECTED TO A TOPS POS.		
Feature	SERVICE CODE	1155	
Feature no	F0938		

SEE FEATURE NUMBER F0935

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	CALLS CONNECTED TO A TOPS POS.		
Feature	SERVICE CODE	1156	
Feature no	F0939		

SEE FEATURE NUMBER F0935

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	CALLS CONNECTED TO A TOPS POS.		
Feature	SERVICE CODE	1158	
Feature no	F0940		

SEE FEATURE NUMBER F0935

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	CALLS CONNECTED TO A TOPS POS.		
Feature	SERVICE CODE	1159	
Feature no	F0941		

SEE FEATURE NUMBER F0935

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	STATION CLASS & CALL TYPE
Feature	PREFIX DIGIT
Feature no	F0942

DESCRIPTION

The arriving call type identification may be provided by a prefix digit. Pretranslation is employed to recognize the call types and route to operator with an appropriate display (0+, 0-) if required.

An example of the use of a prefix digit is the kick pulse to identify operator assistance requirement. The kick pulse is interpreted as digit 1. Timeouts is used to further disconnection between 0+ and 0- type call.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	STATION CLASS & CALL TYPE
Feature	4 - SECOND TIMEOUT ON 0+ CALLS
Feature no	F0943

DESCRIPTION

4 second timeout is employed on Dial Pulse routes to discriminate between 0- and 0+ calls.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	STATION CLASS & CALL TYPE
Feature	TONE IDENTIFICATION OF ONI/ANIF CALLS
Feature no	F0944

DESCRIPTION

When calls are routed to operator for calling number identification the call is identified by a double beep call arrival tone. The CLG# display header is displayed in a steady mode for an ONI call and flashing mode for an ANIF call.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)	
Feature set	STATION CLASS & CALL TYPE	
Feature	IDENTIFICATION OF:	ALARMS,ANI ID 8
Feature no	F0945	

DESCRIPTION

The DMS TOPS is able to detect and route alarm calls to the TOPS position. The TOPS operator will be notified of any alarm condition via visual indication on the VDU. The alarm condition would be detected via ANI information digit 8, dedicated trunk or tone.

Trunk Group	OPR Display
-----	-----

Dedicated with ANI (ID=8)	ALM in row 0, column 0
---------------------------	------------------------

Dedicated without ANI	ALM
-----------------------	-----

Combined with ANI (ID=8)	ALM
--------------------------	-----

Combined without ANI	Non-coin 0-
----------------------	-------------

For the dedicated or combined trunk group with ANI, the DMS TOPS will receive KP + 8 + ST with the ID=8 indicating that it is an alarm call.

For the combined trunk group without ANI, the call will be displayed as 0-. The TOPS operator will hear a tone from the end office. Keying of KPBACK + 0 + ST will display the NPA and the primary NXX.

The NPA + NXX of originating end offices or CDO's will be displayed on the screen if the call arrival display is 'ALM'.

Disposition of the alarm call is done in accordance to the operating company's policy (i.e. call plant personnel and advise of the call details, key in trouble report etc.).

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)	
Feature set	STATION CLASS & CALL TYPE	
Feature	IDENTIFICATION OF:	INTERCEPT, ANI ID 9
Feature no	F0946	

DESCRIPTION

The DMS-TOPS is able to detect and route calls requiring intercept treatment to the TOPS position. The intercepted call will be identified on the VDU, to signal the operator to provide the appropriate response. The intercept condition would be detected via ANI information digit 9, dedicated trunk or class of service tone.

Trunk Group	OPR Display
-----	-----

Dedicated with ANI (ID=9)	INCPT
Dedicated without ANI	INCPT
Combined with ANI (ID=9)	INCPT
Combined without ANI and with post pay coin	NON COIN 0-

- For the dedicated or combined trunk group with ANI, the DMS TOPS will receive CLD KP-ST, CLG KP + 9 + ST with the ID=9 indicating that it is an intercept call.
- For the combined trunk group without ANI, the operator has to rely on tone to determine that the call type is intercept.
- The NPA + NXX of originating end offices or primary CDO's will be displayed if the call arrival display is "INTC".
- Alternatively, the DMS TOPS will receive KP + 9 + NNX + XXXX + ST where NXX + XXXX is the intercepted number. In this case, the call arrival display will be "INTC" and NPA + NXX + XXXX will appear as the calling number.
- If the TOPS office is equipped with transfer feature, it is possible for the operator to transfer the call to an intercept position.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	STATION CLASS & CALL TYPE		
Feature	IDENTIFICATION OF:	TRK CLASS HOTEL/MOTE	
Feature no	F0947		

DESCRIPTION

DMS TOPS will accommodate separate Hotel/Motel trunk groups. Calls arriving over trunk groups identified as Motel will be routed to operator and handled in the same manner as if they arrived over combined groups. As the Motel directory number will be stored in data, ANI is not required.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	STATION CLASS & CALL TYPE
Feature	IDENTIFICATION OF TRUNK CLASS SENT-PAID RESTRICTED
Feature no	F0948

DESCRIPTION

Send paid restricted calls will be routed to TOPS from the end office over a separate trunk group. The call arrival display will indicate '0' or '0+' as appropriate. Normal call handling will occur unless the customer asks for paid billing, in which case 'STA [PD]' or 'PER [PD]' will appear on the operator's screen. The operator can subsequently enter an appropriate billing type e.g. collect, third number.

[] denotes flashing

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	BILLING TYPES
Feature	STATION TO STATION
Feature no	F0949

DESCRIPTION

DMS TOPS will provide the following billing types with details recorded on AMA tape:

- Station to station (coin, non-coin, hotel)
- Person to person (coin, non-coin, hotel)
- Collect
- 3rd number
- Special billing number
- Credit card
- Dial rate
- Credit request
- No AMA
- Automatic collect
- Person to person call back

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	BILLING TYPES
Feature	PERSON TO PERSON
Feature no	F0950

SEE FEATURE NUMBER F0949

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	BILLING TYPES
Feature	AUTOMATIC COLLECT
Feature no	F0951

SEE FEATURE NUMBER F0949

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set BILLING TYPES
Feature PERSON TO PERSON CALL BACK
Feature no F0952

SEE FEATURE NUMBER F0949

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	BILLING TYPES
Feature	DIAL RATE
Feature no	F0953

SEE FEATURE NUMBER F0949

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set BILLING TYPES
Feature AUTOMATIC NO AMA
Feature no F0955

SEE FEATURE NUMBER F0949

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set BILLING TYPES
Feature CREDIT REQUEST
Feature no F0956

SEE FEATURE NUMBER F0949

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	MISCELLANEOUS CALL TYPES
Feature	NOTIFY
Feature no	F0961

DESCRIPTION

DMS TOPS provides Notify service when a caller requests to be notified, the operator keys in the particulars of the request. Upon elapsed time the call is offered to an idle operator with payment call details displayed. Operator then notifies the calling party of the expiration of the notify person.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	MISCELLANEOUS CALL TYPES		
Feature	TIME AND CHARGES	AUTO PRT. ON T&C TTY	
Feature no	F0964		

SEE FEATURE NUMBER F0963

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	MISCELLANEOUS CALL TYPES
Feature	VERIFICATION
Feature no	F0967

DESCRIPTION

The TOPS operator has the facilities to establish a connection to a busy line for the purpose of busy verification. The DMS toll machine will select an appropriate method of busy verification (over dedicated trunk group, or combined group with prefix).

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	HOTEL FEATURES		
Feature	VOICE QUOTE OF CHARGES	ON A CENTRAL TTY	
Feature no	F0968		

DESCRIPTION

Hotel calls are identified through travelling class marks (see identification signals) or separate trunk groups. Upon call arrival at the operator position, hotel calls are identified by a "HOTEL" display.

The operator obtains and keys in the room number and first four letters of callers name. Upon call completion the charges are printed out at a voice quote printer for verbal quotations to the Hotel administration.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	COIN FEATURES
Feature	FLASH RECALL DURING INITIAL PERIOD
Feature no	F0975

DESCRIPTION

During the initial period, the coin subscriber may recall the operator through the use of switchboard flash.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	COIN FEATURES		
Feature	COIN CONTROL METHOD	LINE NUMBER	
Feature no	F0977		

DESCRIPTION

Line number method of coin control provides for insertion of a special code (12 for coin collect, 17 for coin return) between the NXX and XXXX of the coin station directory number. The NXX may be deleted as directed by translations when direct toll connecting trunk is employed, or outpulsed if indirect route is selected.

The special codes together with the coin station directory number are inserted by the DMS system upon receipt of coin control requests from the TOPS operator and sent towards the end office.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)		
Feature set	COIN FEATURES		
Feature	COIN CONTROL METHOD	INBAND	
Feature no	F0978		

DESCRIPTION

DMS-200 will send inband coin control signals to the end offices upon receipt of coin control requests from the TOPS operator.

Inband Frequencies	Indication
-----	-----
700 + 1100 Hz	Coin Collect
1100 + 1700 Hz	Coin Return
700 + 1700 Hz	Ring back

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	COIN FEATURES		
Feature	COIN CONTROL METHOD	MULTIWINK	
Feature no	F0980		

DESCRIPTION

DMS-200 will send the multiwink coin control signals to the end offices upon receipt of coin control requests from the TOPS operator.

No. of Winks Indication

- | | |
|---|---------------------|
| 1 | Operator disconnect |
| 2 | Operator attach |
| 3 | Coin collect |
| 4 | Coin return |
| 5 | Ring back |

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	RATING SYSTEM		
Feature	V-H CO-ORDINATES	CHARGE CALCULATION	
Feature no	F0984		

DESCRIPTION

THE DMS TOPS SYSTEM PROVIDES AUTOMATIC RATING FOR THE FOLLOWING TYPES OF CALLS:

- COIN PAID - HOTEL PAID - COLLECT TO HOTEL - PERSON CALL BACK - T&C

RATE STEP DETERMINATION WILL BE MADE ON THE BASIS OF V & H CO-ORDINATE SYSTEM. ORIGINATING RULE CENTRES MAY BE ASSIGNED TO UP TO 7 TARIFFS. EACH TARIFF DEFINES A SET OF RATE SCHEDULES INCLUDING TAX AND ROUNDING RULES.

RATING WILL REFLECT THE FOLLOWING

- CLASS OF ORIGINATING SERVICE (COIN, NON-COIN) - TYPE OF CALL (0+, 0-, 1+) - CLASS OF CALL (STATION, PERSON) - DISTANCE AND RATE SCHEDULES (UP TO 63 SCHEDULES - 1700 ???

STEPS) - CONVERSATION TIME SUBJECT TO CHANGE - LENGTHS OF INITIAL AND OVERTIME PERIODS (ASSIGNABLE) - TIME OF DAY (UP TO 6 RULE BREAKS) - DISCOUNTS (BY RULES OR PERCENTAGES) - DAY OF THE WEEK, HOLIDAYS - SURCHARGES - TAXES - RULES FOR COIN ROUNDING.

CHARGES IN RATING MAY BE ENTERED INTO THE DATA BASE AND ??? IN ADVANCE OF THEIR EFFECTIVE DATE. A SINGLE COMMAND ACTIVATE, THE NEW DATA AT THE TIME OF INPUT.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	RATING SYSTEM
Feature	POINT TO POINT RATING
Feature no	F0992

DESCRIPTION

IN POINT TO POINT RATING A RATE STEP IS PROVIDED FOR EACH PAIR OF ORIGI-
NATING AND TERMINATING RATE CENTERS FOR INTRASTATE CALLS.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	INSTRUCTIONAL DISPLAY
Feature no	F1012

DESCRIPTION

When a call arrives over a specially designated trunk group, the call arrival display will include a special call handling instruction. The special display consists of up to 6 alphanumeric characters which are assignable by means of Table Control.

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
 Feature set STATION CLASS & CALL TYPE
 Feature BELL SYSTEM STANDARD SIGNALLING FORMAT
 Feature no F1015

DESCRIPTION

DMS TOPS makes use of the Information Digit (I) and Class Signal (ST) in order to determine automatically the type of call (e.g. coin, 0+, etc) arriving on an incoming trunk so that the call type can be displayed to the operator.

The information digit is transmitted from an end office with ANI during the calling number sequence of a call. The format is: KP - I - 7 digits - STX where I has the following meanings:

	Non-observed -----	Observed -----
Automatic Identification (ANI)	0	3
Operator Identification (ONI)	1	4
Identification Failure (ANI Fail)	2	5
Hotel/Motel	6	7
Alarm	8	
Intercept	9	

The class or start signal (ST) is transmitted from an end office during the MF sending sequence of the called number or during the MF sending sequence of the calling number if the end office has DP signalling with ANI.

The format for the MF called number sequence is: KP - 7 or 10 digits - STX and the format for the ANI calling number is: KP - I - 7 digits - STX where STX can be either ST, STP, ST2p, ST3p.

ST = coin 1+
 STP = coin 0+ or 0-
 ST2p = coin 1+
 ST3p = non coin 0+ or 0-

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	MISCELLANEOUS CALL TYPES
Feature	TROUBLE REPORT
Feature no	F1103

DESCRIPTION

Troubles observed by the operator on an intact connection can be reported by the operator when it occurs and while information about the call is available to the system. The operator keys in a 1 or 2 digit trouble code and complete information about the trouble is transmitted to a local plant department TTY and a remote trouble analysis center.

For troubles reported by the customr on a prior connection or trouble conditions on 1+ ONI non-coin calls, the operator keys in a 1 or 2 digit trouble code along with the pertinent call information to be transmitted to the local plant department TTY and the trouble analysis center.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	STATION CLASS & CALL TYPE
Feature	CLASS OF SERVICE TONE
Feature no	F1104

DESCRIPTION

Class of service tones are sent by the end offices to indicate to the TOPS operator whether the call origination is coin, non-coin, intercept, etc. The tones are generally high or low tone which persist for approximately 500 ms and are given on operator answer.

The tones will be repeated to the operator in the event of operator disconnect and re-answer.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	STATION CLASS & CALL TYPE		
Feature	IDENTIFICATION OF:	DIRECT HOTEL TRUNKS	
Feature no	F1107		

DESCRIPTION

DMS TOPS is capable of handling direct termination of Hotel/Motel PBX trunks (analog or digital). Hotel trunks terminated in the DMS-200 TOPS will have the hotel directory number stored against the incoming trunk group.

A subscriber originating a call from the hotel dials the access code 8, receives dial tone from the hotel/motel PBX and dials 0+ or 1+ 7/10 digits. The call is routed to a TOPS operator and will be provided 'HOTEL' display on the position. No ANI is forwarded to the DMS-200 TOPS but instead the hotel number stored against the incoming trunk group will be displayed in the 'CALLING NUMBER' field when the operator depresses 'CALL DETAIL' key.

The call is handled in the same manner as regular hotel calls by the operator and the system.

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set BILLING TYPES
Feature COLLECT
Feature no F1108

SEE FEATURE NUMBER F0949

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set BILLING TYPES
Feature THIRD NUMBER
Feature no F1109

SEE FEATURE NUMBER F0949

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set BILLING TYPES
Feature SPECIAL BILLING
Feature no F1110

SEE FEATURE NUMBER F0949

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	BILLING TYPES
Feature	CREDIT CARD
Feature no	F1111

SEE FEATURE NUMBER F0949

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	COIN FEATURES
Feature	VARIABLE INITIAL PERIOD
Feature no	F1112

DESCRIPTION

Calls originated from coin stations are routed to operator for quotation of initial charges and collection of initial deposit (station to station call). The initial period and the overtime recall periods are assignable by the telephone company.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
Feature set	SWITCHING AND TRANSLATION
Feature	INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
Feature no	F1127

DESCRIPTION

DMS TOPS equipped with the Enhanced Call Handling package will add international calls to the list of call types handled. Both station sent paid and operator assisted calls may be routed through DMS TOPS.

International calls may be offered to TOPS over combined incoming CAMA and Recording Completing trunk groups. Incoming digit formats recognized will be as follows:

From SXS offices (DP)

11 + CC + NN + ANI (if applicable) for station sent paid calls (subscribers access code 011)

1 + CC + NN + ANI (if applicable) for operator assisted calls (subscriber access code 01)

From Common Control Offices (MF)

KP + 1 + CC + NN + STX + ANI

where - 1 is international call identifier
 - CC is country code NN is national number
 - call type and station class is transmitted via the STX signal and ANI-ID digits

where STX can be ST, STP, ST2p, ST3p as follows:

ST = 011 coin
 STP = 01 coin
 ST2p = non-coin
 ST3p = non-coin

The DMS TOPS will forward international calls to the international switching centre using two stage outpulsing.

The first stage outpulsed on receipt of the first wink signal will be of the format KP + 1XX + ST or KP + 011 + XXX + ST

where - 1XX is the gateway code
 - 011 is the international identifier

- XXX is a country code augmented to three dials

The KP + 1XX + ST format is employed when DMS TOPS selects the gateway on the basis at country code translation. The KP + 011 + XXX + ST format is employed when gateway selection is to be made by other toll switchers in the DDD network. The first stage may be omitted if DMS TOPS has direct trunks to the gateway switch. The second stage of outpulsing is of the format KP + CC (or PCC) + NN + ST and is transmitted end to end to the Gateway office upon receipt of the second wink or delay dial signal. Pseudo Country Code (PCC) is employed when the call is operator assisted to inform the gateway office to select an appropriate language digit.

Package NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
 Feature set STATION CLASS & CALL TYPE
 Feature NORTH ELECTRIC FORMAT
 Feature no F1139

DESCRIPTION

The AMR 5 system will process 0+, 0- and 1+ flat rate, coin and hotel calls. The AMR 5 uses three optional outpulsing modes with multifrequency outpulsing. Mode A is used with offices that use MF outpulsing, combined trunk groups and repeat the access code in the called number format. Mode B is used where an office has the same characteristics as described for Mode A except it does not repeat the code in the called number format. Mode C is used in offices with MF outpulsing and dedicated trunk groups.

The table below outlines the three modes and their formats.

MODE	CALL TYPE	CALLED #	FORMAT	CALLING #	FORMAT
7D + ST*	A	0+		KP + 0 + 7/10D + ST	KP + CAT +
		0-		KP + 0 + ST	KP + CAT + 7D +
		1+		KP + 1 + 7/10D + ST	KP + CAT +
+ ST	B	0+		KP + 7/10D + ST	KP + CAT + 7D
		0-		KP + ST	KP + CAT + 7D + ST
		1+		KP 7/10D + ST	KP + CAT + 7D +
+ ST*	C	0+		KP + 7/10D + ST	KP + CAT + 7D
		0-		KP + ST	KP + CAT + 7D + ST*
		1+		KP + 7/10D + ST	KP + CAT + 7D

The AMR 5 format accommodates Dial Pulse (Called Number) and calling number in MF for the above modes.

The CAT is a two digit category code used to convey the information in the ANI format.

Although the CAT normally is a 2 digit code, three digit CAT codes are also used. Certain telcos use different CAT codes than the ones outlined

below, therefore, DMS-100 TOPS provides flexibility for CAT codes to be data-fill oriented as required by the telco on an office basis.

The following are the recommended CAT format used by ITT-North for AMR 5.

TENS DIGIT

5 Home are tributing 1
6 Foreign area tributing 1
7 Foreign area tributing 2

UNITS DIGIT

0 Non coin
1 Automatic time and charges
2 Hotel
3 Coin
4 Toll station
5 IMTS
6 ANI FAIL/ONI
7 Denial Toll
8 Coinless Paystation
9 ONI

The tens digit is not call dependent. It depends only on the location of the local office with respect to the AMR 5 System.

ST may be any of the following signals:

Normal	- ST
ANI Fail	- ST2P
Station to Station (1+)	- KP
Premium (0+)	- STP

ST* may be one of the following:

Normal	- ST
ANI Failure	- ST2P

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	BILLING TYPES
Feature	TOLL FREE CALLS
Feature no	F1242

FEATURE SYNOPSIS

In addition to the following billing types:

- Station to Station (coin, non-coin, hotel)
- Person to person (coin, non-coin, hotel)
- Collect
- 3rd number
- Special billing number
- Credit card
- Dial rate
- Credit request
- No AMA
- Automatic collect
- Person to person call back

DMS Tops will also provide details recorded on AMA tape to toll free calls.

FEATURE DESCRIPTION

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
Feature set	CALLS CONNECTED TO A TOPS POS.
Feature	TWO WAY OPERATOR OFFICE TRUNK (TWOOT)
Feature no	F2224

DESCRIPTION

DMS-TOPS can accommodate combined call type trunk groups from end offices where the called number is outpulsed in DP or MF and the call type discrimination information is provided with the ANI sequence (MF pulsing).

The incoming digit sequence is as follows:

Called Number (DP)	Calling Number (MF)
-----	-----

No. of digits = 7 or 10	KP + ID + 7D + ST*
with or without kick pulse	where ST* may be ST, STP, ST2p, ST3p

For more information on ST signal, refer to AT&T Notes on Distance Dialing.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	STATION CLASS & CALL TYPE		
Feature	IDENTIFICATION OF:	ORIGINATING CLASS -	
Feature no	F2289		

DESCRIPTION

ANI equipment in some end offices connecting to a DMS-100/200 TOPS is incapable of generating the complete range of ST signals (ST, STP, ST2p, ST3p) and ID digits. Consequently it is unable to transmit information about the class of service of the calling line (Coin Hotel) over combined class trunk groups.

To permit the use of combined class of service trunk groups, (it will still be necessary to separate 1+ CAMA calls from 0+/- calls, 1+ coin cannot be allowed) the DMS TOPS provides the capability to determine the originating class of service through matching the calling number with a list of stored numbers.

The list is capable of accepting any of the classes of service handled by the TOPS system - currently available or added in the future. The class of service identified by this method shall be displayed to the operator as a part of normal Initial Position Seizure display. If a received ANI spill does not appear on the list, the default display to operator shall be that of a non-coin line without billing restrictions.

The capability of determining the originating class of service by the above method is provided on a per trunk group basis. Trunk groups assigned the ANI search treatment will have their own lists of lines identified for non-default display.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB		
Feature set	TOPS		
Feature	SEMI AUTOMATIC ZENITH		TOPS
Feature no	F2332		

FEATURE SYNOPSIS

Zenith is a service used by some businesses (e.g. shopping centres) and organizations (e.g. Income Tax Office) which permits subscribers to call from certain long distance points without a charge (the call is billed to destination numbers). The semi-automatic Zenith in DMS-TOPS allows the TOPS operator to key in a 5 digit Zenith number given verbally by the calling party into the system. The CC software checks the validity of the number and terminates on a pre-assigned called number if the subscriber is permitted to do so.

FEATURE DESCRIPTION

In the manual system (e.g. in SP-1 TOPS) the operator has to look up the Zenith number in the table. If the number is not found, the calling party will be told the number is invalid. If the number is found, then he will have to check if the calling party's nnx is allowed to access the given Zenith number. If not found, the calling party will be told that he is not authorized to complete the call. If found, the operator will complete the call by forwarding the call to the forward destination number listed next to the set of nnx's.

This feature automates the validation check on the Zenith numbers and speeds up Zenith calls. This feature can handle up to 2,000 Zenith numbers. Under each Zenith number, which may consist of from 1 to 5 digits, there will be a number of forward destination numbers and a calling point set corresponding to each forward number. The calling point set is a set of data containing the local call area name of the calling subscriber, an npa and anywhere from 0 to 20 nnx's. Authorization is given to forward the call if either the local name of the incoming trunk or the calling nnx of the call matches the data contained in the calling point set. The calling point set can be shared by other Zenith numbers.

The operator's procedures is summarized as follows:

- Zenith call arrives and is displayed on the CKT as a 0- call
- The subscriber forwards the Zenith number verbally
- The operator keys in KPFWD + 800 + Zenith number + START

- DMS TOPS performs two levels of validity check:
 - The first level is to check the validity of the Zenith number in Table Zenith. If a match is not found, the operator will be notified by the VCA code displayed on the screen. The operator then notifies the caller of the anomaly.
 - If the first level of validity check is successful, a further check is carried out by comparing the calling number NXX with data stored in the calling point set data Table (CLGSET Table) to determine whether the calling party is allowed to access the given Zenith number. If the check is unsuccessful, the operator will be informed by the VCA code displayed on the screen.
 - If the check is successful, permission is granted to complete the call by forwarding the forward destination number.
- The operator then releases by keying POS RLS.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)		
Feature set	MISCELLANEOUS CALL TYPES		
Feature	TIME AND CHARGES	RECALL TO OPERATOR	
Feature no	F2334		

FEATURE SYNOPSIS

A time and charge (T&C) call refers to an operator-assisted call for which the originating subscriber is given the call duration and charges applied upon call completion.

T&C recall to operator provides for immediate connection of originating subscriber to an available operator at the end of his call for voice quote of time and charges.

Please note that this feature addresses only the recall to operator aspect of T&C calls. The basic TOPS software package already fully supports T&C calls by automatically computing elapsed time and charges upon call completion, and sending this information to a Teletypewriter (TTY) of a T&C position. Later an attendant calls back the subscriber to quote time and charges. Also in place is a fully automatic hotel administration system (HOBIC) which provides hard copy T&C messages to receive only terminals located on individual hotel premises and other locations subscribing to hotel- type charge quotation service.

The T&C Recall to Operator Feature enhances these existing T&C facilities by providing

1. improved customer service with immediate quotation upon call completion, and
2. more economical Telco operation by using already established connections for voice T&C quotations.

FEATURE DESCRIPTION

When the calling subscriber requests time and charges, the operator depresses the T&C key at her position. When T&C is displayed on the screen, the customer is instructed to remain on the line at call completion for an immediate T&C quote. Timing is started and the position is released in the normal manner.

Floated calls return automatically at disconnect to the most idle operator for time and charge quoting. Only the party requesting the time and charge is recalled to the operator, as the other party is automatically released prior to recall. The call type is identified by T&C displayed in

the call origination field on the screen. Standard details are displayed, along with computed charges (excluding tax) and chargeable time.

Time and charges are immediately quoted, provided that the party is still on the line, as indicated by the on-hook or off-hook supervision display. Otherwise the operator attempts to re-establish the connection by keying RLS BACK and START. After the customer acknowledges the T&C quote, the operator releases her position.

If the operator is unable to reach the party requesting T&C, she depresses the T&C key, causing all T&C details to be sent to the Time and Charge position of the HOBIC system for voice quote to the customer at some later time. As a response to this keying action, PRINT T&C is displayed on the screen, and the operator then releases her position.

Some of the restrictions are:

1. A T&C request is not compatible with an originating special billing number.
2. A called party T&C request may apply on a Collect Call.
3. The T&C key is not effective for AUTO COL, COIN PAID, HOTEL PAID or COLLECT TO HOTEL.
4. Special Time and Charge, described below, must be considered.
5. A T&C call held on loop must be accessed rather than recalled.
6. This feature may be activated/deactivated by the Telco.

Special Time and Charge is a variation of T&C recall. The calling party offers a file or extension number, which he would like quoted along with the time and charges for T&C identification. The operator enters this number by keying KP ROOM plus the digits of the extension or file number. This information must accompany the T&C call for its duration, being displayed on the operator's screen on input as well as at recall, and sent to the Time and Charges position if necessary.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	BILLING TYPES
Feature	DOMESTIC BILLING RESTRICTIONS
Feature no	F2335

FEATURE SYNOPSIS

Billing restrictions currently exist for overseas calls, however it is also necessary to restrict billing within specific regions of the north american dialing plan. These restrictions are to be referred to as domestic billing restrictions. They include:

1. credit card billing restrictions - credit cards from a given region within the North American dialing plan
 - a) may not be billed to at all
 - b) may only be billed to when a call is made to the same region
2. third number billing restrictions - third numbers from a given region within the North American dialing plan
 - a) may not be billed to at all
 - b) may only be billed to when a call is made to the same region
3. collect call billing restrictions - within a given region
 - a) both station and person collect calls are allowed
 - b) both station and person collect calls are denied
 - c) only person collect calls are allowed
 - d) both station and person collect calls are allowed but the operator must manually record the called party's name.
4. person rate billing restrictions - within a given region only person rate calls are allowed (i.e. no station billing is allowed).

FEATURE DESCRIPTION

To implement the above feature, two new tables are used: table dombilland table region: table dombill will map region names to billing restrictions, a region will be the name given to an area within the North

American dialing plan. The region name may be up to sixteen alpha numeric characters long. One entry will be allowed for each unique region name, each entry will contain the following fields:

1. an identifier which indicates that
 - a. both station and person collect calls are allowed (alw).
 - b. both station and person collect calls are denied (den).
 - c. only person collect calls are allowed (per).
 - d. both station and person collect calls are allowed but a manual record must be made of the called party's name (man).
2. an identifier which indicates that station rate calls are denied (y, n).
3. an identifier which indicates which calls are allowed to bill to a third number
 - a. all calls: no restrictions apply (all).
 - b. no calls may bill to a third number (none).
 - c. only those calls where the third number and called number are within the same region (reg).
4. an identifier which indicates which calls are allowed to bill to a credit card
 - a. all calls; no restrictions apply (all).
 - b. no calls may bill to a credit card (none).
 - c. only those calls where the credit card and called number are within the same region (reg). Table region will map region names to third numbers and credit card numbers. The number may be up to six digits in length and of the form NPA-NXX, or RAO-0/1XX. More than one number may be mapped against a region name.

Note:

If a number does not appear in the table region, its region is assumed to be Canada or the United States and domestic billing restrictions do not apply. This feature is intended to be used with other countries within the North American dialing plan (e.g. Mexico, Jamaica, the Caribbean) however areas within Canada and the United States (e.g. Alaska, the North West Territories) may also be classed as separate regions. If a collect call does not pass the domestic billing restriction check, and the billing field of table dombill is set to -

- a. den - the collect field (col) will flash while the station
- b. per - the collect field (col) will remain steady while the station (sta) field flashes.

- c. man - both the collect field (col) and the station (sta) or person (per) field will flash indicating that a manual record must be made of the called party's name.

If a station rate call does not pass the domestic billing restriction check because the deny station field of table dombill is set to y the station field (sta) will flash.

If a third number does not pass the domestic billing restriction check, and the billing field of table dombill is set to -

- a. none - the person (per) or station (sta) field will remain steady while the special number (spl clg or spl cld) flashes.
- b. per - the digits of the third number will flash and the called number will be displayed steady.

If a credit card does not pass the domestic billing restriction check, and the billing field of table dombill is set to -

- a. none - the person (per) or station (sta) field will remain steady while the special number (spl clg or spl cld) flashes.
- b. per - the digits of the credit card will flash and the called number will be displayed steady.

Reference

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	RATING SYSTEM
Feature	MINIMUM CHARGE
Feature no	F2336

FEATURE SYNOPSIS

This feature provides the Telephone Company the capability to specify a minimum charge for calls rated by the DMS TOPS. The Telephone Company can specify via datafill the minimum charge before taxes, surcharges or nickel coin rounding.

FEATURE DESCRIPTION

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	COIN FEATURES
Feature	VARIABLE LOCAL COIN CHARGE
Feature no	F2337

FEATURE SYNOPSIS

This feature allows local calls rated by the Tops System and originating from coin stations located at schools and hospitals to be charged at a lower rate than other local coin calls.

FEATURE DESCRIPTION

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	EXPANDED OPERATOR DISPLAY
Feature no	F2338

FEATURE SYNOPSIS

In addition to TOPS standard display, this feature allows Telco to assign special instructional display based on the incoming TOPS trunk group. The display consists of a maximum of 6 characters and follows the CLG NUMBER display (second row at position 24 to 29).

FEATURE DESCRIPTION

To implement this feature, an instructional display number (0-31) is given to the field Display of the TOPS trunk group data. This number is then used to point to the required display in table TOPSDISP. If the Display field of the Trunk group table is set to 0, there will be no instructional display associated with that trunk group.

Note that DMS-TOPS features another Telco modifiable 6 character display based on Call origination. The Call origination display which appears on Row 0 Column 0 of the TOPS CKT can be either standard or a 6 character header specified by the Telco TOPS.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)		
Feature set	STATION CLASS & CALL TYPE		
Feature	SELECTIVE CALL SCREENING	ANI ID-7	
Feature no	F2348		

DESCRIPTION

DMS TOPS will not interpret ANI ID-7 as Hotel Service Observed calls. Instead, it will use it for selective call screening.

ANI ID-7 will be used over combined trunk group to indicate that the originator subscriber has special class of service. This feature will provide the capability of determining the originating class of service (coin, hotel restricted sent paid ...) by searching the special directory number ID table SPLDNID with the calling number as a key.

If the calling number is not in the SPLDNID table, the call will be handled as ANI Fail with station class unspecified (0 flashing).

ST signal will not be used to determine class of service accompanied by ID-7.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	RATING SYSTEM
Feature	RATE PERIOD SPECIFIC BILLING
Feature no	F2373

DESCRIPTION

The Rate Period Specific Billing (RPSB) allows all TOPS rated calls to be calculated according to the rate (discount) in effect at the beginning of each overtime period. Most specifically, a call that starts in one rate period and continues into another uses the discount applicable in the first rate period on the first part of the call, and the discount applicable in the second rate period on the second part. For example, consider a 10 minute hotel paid call with answer at 22:56:59

- CHARGES:

\$2.00 / first three minutes (not discounted)
 \$0.70 / additional minute

- DISCOUNTS:

18:00 -> 23:00 1/3 off
 23:00 -> 24:00 2/3 off

- STANDARD ALGORITHM:

\$2.00 (first three minutes; no discount)
 3.27 (seven additional mins, 1/3 off; $7 \times 0.70 \times 2/3 = 3.267$)

 \$5.27 TOTAL CHARGE

- RATE PERIOD SPECIFIC BILLING:

\$2.00 (first three minutes; no discount)
 0.47 (first additional min, 1/3 off; $0.70 \times 2/3 = 0.467$)
 1.40 (six additional mins, 2/3 off; $6 \times 0.70 \times 1/3 = 1.40$)

 \$3.87 TOTAL CHARGE

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	DELAY CALL DENIAL
Feature no	F2405

FEATURE SYNOPSIS

This feature enables a telephone company to control operator originated backward connections (delay calls). The Telephone Company has the option to deny ill delay calls, deny select delay calls or allow all delay calls. The Telephone Company can establish the desired option by datafill in a new pretranslation table.

FEATURE DESCRIPTION

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	AMA RECORD OF SPECIFIED UNANSWERED CALL TYPES
Feature no	F2413

FEATURE SYNOPSIS

This feature provides the Telephone Company the capability to specify the unanswered call type it selects to record on AMA tape. The Telephone Company selects the unanswered call types by specifying the call origination types of the required unanswered call types.

FEATURE DESCRIPTION

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	RATING SYSTEM
Feature	INDEPENDANT COIN RECALL INTERVAL
Feature no	F2422

FEATURE SYNOPSIS

With this feature the Telephone Company can change the initial coin recall period on coin calls independent of the initial period.

FEATURE DESCRIPTION

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	STATION CLASS & CALL TYPE
Feature	FLEXIBLE ANI ID = 8,9 HANDLING
Feature no	F2456

FEATURE SYNOPSIS

The format of the ANI spill is: KP + ID + 7 calling digits + ST* where ID digit (0 to 9) is used to carry information about the ANI status and type of calling subscriber.

The use of ID=8 and 9 has different meaning within the industry. For example, NTC standard for ID=8 is CALL TYPE ALARM, where as for AT&T ID=8 means HIGH CAPACITY MOBILE CALL.

The current feature provides a Telco definable table (BELL CAT) similar to table AMRCAT which is used to specify the meaning of the ANI ID digits and also route to any position or outgoing trunk based on the digit.

FEATURE DESCRIPTION

The Telco modifiable table, BELL CAT, maps an ANI ID digit received in the ANI spill to ANI information and office routes. The ANI information in the table contains:

- a) ANI spill formats
- b) Calling service feature
- c) Special office route

The ANI spill formats indicate how many digits were expected in the ANI spill and may take one of the following formats:

ANI - expected to receive an ANI ID digit, a 7 digits calling number and an ST pulse, the call is marked as ANI SUCCESS.

ANIID - expected to receive an ANI ID digit and an optional ST pulse. No calling number was expected and operator identification of the calling number will not be required.

ONI - expected to receive an ANI ID digit and an ST pulse. Operator identification of the calling number is required, the ANI status is set to ONI_CALL.

ANIF - an ANI failure has been detected at the originating office. Expected to receive an ANI_ID digit and an ST pulse. Operator identification of the calling number is required.

ANI_ANIF - expected to receive at least an ANI ID digit and an ST pulse. If no calling digits were received an ANI failure has been identified by the originating office. If we received 7 digits the call will be marked as ANI SUCCESS.

ANI_ANIID) - expected to receive at least an ANI ID and an ST pulse. If no calling digits were received, operator identification of the calling number will not be required. If we received 7 digits the call will be marked as ANI SUCCESS.

The calling service feature can be one of the following types:

STATION, - calling service feature and call orig is set by looking at the ST pulse if the trunk is combined or cama trib. If the trunk is class of service lookup then the calling service feature is set by looking in table SPLDNID using the calling number as an index and the call origination is set by looking at the ST pulse.

HOTEL, - calling service feature set to HOTEL if the trunk is combined or cama trib. The call origination is set by looking at the ST pulse.

SPECIAL, - if the trunk is combined, calling service feature is set by using the calling number as an index into table SPLDNID. The call origination is set by the ST pulse.

ALM, - calling service feature is set to station regardless of the originating trunk group and the call origination will be set to ALM.

INTC, - Calling service feature is set to station regardless of the originating trunk group and the call orig. will be set to INTC.

MOBILE - calling service feature is set to station regardless of the originating trunk group and the call origination will be set to MOBILE.

The special office route indicates how the call is to be routed. It can be used to send the call to a position or an outgoing trunk. This field overrides any routing information derived from the called number. If the route is to a position the call origination type will be reset to be the index into the routing table indicated (table TOPS or AOSS).

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	AMA FAILURE ROUTING OPTIONS
Feature no	F2475

FUNCTIONAL DESCRIPTION

1. BACKGROUND

The objective of AMA system is to record billing details of all chargeable calls onto a device (tape or disk).

During the call, most of the call-processing agencies store information about the call in the CCB. When the call ends (disconnects) the agency will get a recording-unit extension block, and copy the billing information to it. Then the recording-unit extension block is detached from the CCB and put on the EXT queue.

The AMA process periodically checks the EXT queue. If the EXT queue is not empty, then the data in the EXT queue is formatted into a specified layout (NT, ATT or SMDR format) and stored in a 2048-byte buffer. When this buffer is full it is written to the AMA device (tape or disk).

During the above process of recording charge information, the following cases might happen which will result in charge free calls. This feature provides routing options which can be used to charge toll calls during AMA problems/failure.

- 1) No AMA devices (or files) are available.
- 2) No recording-unit extension block is available.
- 3) An AMA process traps due to software bugs. At present, after fixing the problem a warm restart is required to recover the AMA system.

2. FEATURE DESCRIPTION

2.1 Type of Office

This feature will apply to DMS-100, DMS-100/200, DMS-200 switches only.

2.2 The Proposed Routing Options

The following illustrates the proposed different routing options under AMA failure for different DMS office configurations.

i) DMS-100 (LAMA) office or DMS-100/200 (LAMA/CAMA) combined office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

ii) DMS 200 (CAMA) office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

iii) DMS TOPS office

The present TOPS handles CAMA failure cases as follows:

a) due to no CAMA TOPS recording units:

The way TOPS handles CAMA call is to get a CAMA TOPS recording unit before collecting calling numbers. If the recording unit is not available, the call is blocked and routed to a treatment.

b) due to no devices(files) or process dead:

The call will be routed free of charge.

In case of condition (a), the calls will now be pegged under the AMAROUTE om register.

In case of condition (b), the calls will now be pegged under the AMAFREE om register.

No other changes will be made in the TOPS call handling because of the existing TOPS call processing design.

AMA restart process command will apply to the TOPS AMA process (see MM section for AMARESTART command).

3. ALARMS AND LOGS

If AMA failure is detected, both DIRP and OFFICE ALARM subsystem will generate alarms with log reports.

3.1 MAP Alarm Indications

The alarm indications will be displayed under IOD and EXT at the MAP MTC subsystem for the following failure cases (as defined in section 1) :

	IOD	EXT
a. no active file available:	NO AMA *C*	1 CRIT *C*
b. no recording unit:	AMA B *C*	1 CRIT *C*
c. process dead:	AMA B *C*	1 CRIT *C*

If there were more than one failed cases happened, the EXT and IOD MAP alarms will be cleared only if all the failed cases are recovered. Telco should check the DIRP logs for failed reasons.

3.2 Logs

There will be two logs: DIRP101 and EXT108 generated for AMA failure. Each failed case is indicated in DIRP101 log with stream name in SSNAME and failed reason in TEXT.

Only one EXT108 log showing AMAFAIL ON is available even though there might be more than one failed cases and only one EXT108 log showing AMAFAIL OFF is available when all the failed cases have been recovered.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL PROCESS
Feature	TOPS - CHARGE_A_CALL ENHANCEMENTS
Feature no	F2527

FEATURE SYNOPSIS

This feature rationalises the selective billing, already in existence in DMS-TOPS, applicable to certain types of calls. This feature is triggered by reception of ANI ID digit 7 on a dedicated or combined trunk group and determination of screening type is based on ANI match. If a match is found, a customer defineable display will be given at the TOPS position, on call arrival, to warn the operator of the special treatment of this call.

FEATURE DESCRIPTION

There is a requirement in DMS-TOPS to apply selective billing to certain types of calls. In other words, certain origination classes will be restricted with respect to the type of billing that can apply to their calls. An entry will be made in table SPLDNID for every originating number which will be so restricted. Upon reception of an ANI ID digit 7 on a combined trunk, table SPLDNID will be entered in an attempt to match the calling number with one of the entries in the table. If a match is found, a customer definable display will be given at the TOPS position, on call arrival, to warn the operator of the special treatment of this call.

A new TOPS trunk group type will also be created to carry such traffic. Upon reception of an ANI ID digit 0 or 7 on this special trunk group type, table SPLDNID will be entered to search for a match to the calling number. This case will be handled in the same manner as the one described above. If a match is not found in table SPLDNID or the ID digit is not 0 or 7, the call will be processed as if it had arrived on a regular combined trunk. If the ANI ID digit is 0, the ANI spill will be preserved. However, if the ANI ID digit is 7, the call will be treated as an ANI failure.

Once at the TOPS position, such a call will not be allowed to be floated until a billing type compatible with its restricted billing class is entered by the operator. If an incompatible billing type is entered, information will be flashed on the position's screen to signify to the operator that the billing type is invalid. At this point, the operator will have to inform the customer that the billing type is invalid and will ask him for a new one. In no case will a call be floated from a TOPS position if an incompatible billing type is in effect.

If the call arrived at the TOPS position as an ANI failure, a search of table SPLDNID will also be made when the operator keys in the back number to see if it matches any entry in the table. This will be done in all

cases unless the calling service class of the call has already been identified (dedicated trunk group, coded ST signals, ANI ID digit, etc...).

The customer will be able to activate up to 4 restricted billing classes via a new system table, table RESTBIL. An entry in this table will contain the types of billing allowed for this billing class and the screen display given at the TOPS position upon arrival of a call identified as being of this restricted billing type (see DSC section of this document for more information). The allowable billing types will be:

- sent paid
- collect
- credit card
- third party
- special calling
- special called

The display on the TOPS screen will be given in the calling party class of service field and will be a maximum of 8 alphanumeric characters.

Another new system table, table RESTAMA, will be used to specify, for each of the restricted billing classes activated, what calling class should be printed on AMA (noncoin, coin, hotel).

If an invalid type of billing is input at the TOPS position, the billing display will be flashed to indicate to the operator that a new billing type is required to complete the call. The flashing billing display will be given to the operator once it has been determined to be invalid (in the case of SPL CLG, this could be only after the spl clg number has been entered so we can determine what type of special number type it is).

It will also be necessary to modify the display given at the screen of a service analyst for calls with restricted billing classes to reflect the class of service of the call being service analyzed.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	TOPS
Feature	V AND H LATA RATE ENHANCEMENT
Feature no	F2627

FEATURE SYNOPSIS

Modifies the V&H rating structure to accommodate the LATA network.

FEATURE DESCRIPTION

This feature enhances the domestic - toll - rate - step calculator by the addition of a new table to the existing CLDNPA.

The rate step is calculated as follows:

The new table CLDNAPEX is the addition and this table and CLDNPA table are internally the same, although the external representation of CLDNAPEX is <NPA, NXX, TARIFF, RATETYPE, SCHNUM> and the CLDNPA remains <NPA, TARIFF, RATETYPE, SCHEDULE>.

The internal CLDNPA table itself is changed so that TARIFF is the first key and NPA the second, because there are fewer TARIFFS than NPAs and hence the store taken will be smaller. The extension consists of a tool 'extended' which controls an overlay. This chooses either the standard rate type and schedule or a pointer to a table of NXX size of rate type and schedule. Also, the variable maximum tariff number is increased to 63 from the current 7.

The tariff data is found in the CLGTRF table. Then the CLDNPA table is searched for the NPA of the called number and the tariff of the calling number. If found, the rate type and schedule are retrieved as before and the rate calculator is called. If not found, then the CLDNAPEX table is searched with the calling tariff, called NPA and NXX as keys. If found, the rate type and schedule are sent to the rate step calculator.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	RATING SYSTEM
Feature	PSEUDO HOTEL NXX TABLES
Feature no	F2700

FEATURE SYNOPSIS

This feature provides a mapping arrangement to identify hotel originated TOPS calls with a pseudo number with ANI ID 6 or 7 and then via a look up table obtain the actual hotel number for T&C purposes.

FEATURE DESCRIPTION

Cross-bar and step by step offices do not send the ANI ID digit 6 or 7, thus making it impossible for operators to identify these calls as hotel calls.

To overcome this, the hotel calls are first routed to another office which can provide the ANI ID 6 or 7. However, these will give in the ANI spill a different originating number.

The operator, having identified the call as hotel call will only have the pseudo number of the FX line. This feature implements a look up table FXDNMAP, which contains the mapping between the pseudo number and the actual originating hotel number.

This feature is implemented for all types of signalling that TOPS can handle OSS, BELLANI and AMRS.

Table SPLDNID will still be used to locate the numbers because it covers the actual numbers.

Reference - BR0700

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	RATING SYSTEM
Feature	FRACTIONAL TAX
Feature no	F2737

FEATURE SYNOPSIS

Enhance the tax structure of the TOPS rating system to permit fractional taxes expressed as a tenth of a percent.

FEATURE DESCRIPTION

Rating system did not allow a decimal in the calculation of taxes, only an integer could be used.

Those calls that are rated by TOPS are either local, domestic, service or overseas calls (include coin or non coin). The rating system is defined as a collection of data tables containing customer dependent data require to calculate the rate step charges on a real time basis. Rate steps are defined as numbers assigned to mileage bands radiating from the saving office code (NXX) or not included in the mileage band outside of North America. Though rating may be either manual, semi-automatic, or automatic the rate step is determined before the charges of a call are calculated. In charge calculations one of the factors that applies is the tariff. A tariff is described as a set of rate schedules applicable to chargeable call calls, which includes tax and rounding information. A rate schedule of a common set of rating characteristics that apply from originating point to the terminating point of the call.

This feature allows a fractional tax to be used for chargeable calls.

Ref: BR0737

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL PROCESSING
Feature	QUEUE SELECTION ON TRUNK GROUP BASE
Feature no	F2775

FEATURE SYNOPSIS

This feature allows a telco to queue or forward an operator call to a transfer operator position of the traffic operator position system (TOPS) as a trunk group basis to handle the problem such as language difficulties.

FEATURE DESCRIPTION

This feature allows the telco to queue or forward an operator call directly to the transfer operator position on a trunk group basis. An operator call is forwarded to a transfer operator position on a trunk group basis only if a call cannot be completed using the mechanized calling card services (MCCS) or the automatic coin toll services (ACTS). Therefore, this feature does not affect the MCCS or the ACTS call handling.

A new office parameter TOPS_SEL_XFR_OPR_TRK is created to turn on/off an automatic selection of the transfer operator position based on a trunk group on the switching unit. The office parameter TOPS_SEL_XFR_OPR_TRK is activated immediately.

A new table transfer operator selection (XFROPSEL) is created to allow the operator calls to be routed directly to a transfer operator position on a trunk group basis. The table XFROPSEL contains one tuple for each TOPS trunk group which requires all operator calls to be forwarded to a transfer operator position. The table specifies if a trunk group is marked to queue or forward an operator call to the selected transfer operator position.

If the XFRTYPE is greater than the kind of the transfer operator position types permitted by the office parameter TOPS_NUM_TRANSFER_TYPES on the switching unit then the call is routed to a general operator position. Also for the first such call an audible minor alarm is turned on with a log indicating that the calls requiring transfer operator position are routed to a general operator position. All calls arriving on the incorrectly marked TOPS trunk groups are forwarded to a general operator until the problem is corrected. The audible minor alarm is cleared when the XFRTYPE for all the tuples in the table XFROPSEL are corrected to the transfer operator position type permitted.

Also 1FR, COIN and HOTEL line to TOPS operator calls can be forwarded to a transfer operator position. Refer to the NTP 297-2271-451 for more details of how the ZEROMPOS field entry in the table line attribute (LINEATTR) for the line and the table TOPS line display (TOPLNDIS) are used to determine the TOPS trunk group CLLI. This CLLI name is used to

index the table XFROPSEL to determine if a call is to be forwarded to a transfer operator position.

Note that also in an operator centralization (OC) environment, an operator call can be directly forwarded to a transfer operator position.

This is achieved by marking an incoming TOPS trunk group in the table XFROPSEL as described previously in a REMOTE office. All operator calls arriving on the marked trunk groups in the REMOTE office are forwarded directly to a transfer operator position in the HOST office.

Ref: BR0775

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL CONNECTED TO A TOPS POS
Feature	0+ LOCAL CALLS ON DMS-200 TOPS
Feature no	F2776

FEATURE SYNOPSIS

This feature allows the option of routing 0+ local calls to a DMS-200 traffic operator position system (TOPS) for billing to either a third number or a credit card using the mechanized calling card service (MCCS).

FEATURE DESCRIPTION

This feature allows calls to a local number to be dialed as 0+ calls and thus to be billed to a credit card using the MCCS feature or to a third number. These calls are handled as any other toll call presented at a DMS-200 TOPS, except that the call is billed at a flat rate charge as for a local call.

A new office parameter TOPS_OPLUS_LOCAL is created to select a set calling service classes (coin, hotel, station or restricted) which are allowed to make 0+ local calls. For example, if TOPS_OPLUS_LOCAL is the set (COIN, HOTEL), then all 0+ local coin calls and 0+ local hotel calls are allowed. All 0+ local station calls and 0+ local restricted billing calls would not be allowed and would be routed to a customer specified treatment. If it is not possible to determine the type of call (for example, automatic number identification (ANI) failure) then the call will be routed to an operator position for determination unless the office parameter TOPS_OPLUS_LOCAL is set to NONE (i.e., ()), in which case the call will be routed to treatment.

When a 0+ local call is presented to an operator position, the called number digits are displayed and identified as being dialed as a 0+ local call.

This feature ONLY works for trunks to TOPS calls in a DMS-200 office, not for standard line to TOPS calls.

REF: BR0776

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	COIN FEATURES
Feature	TOPS COIN SUPV. SIG. OPTION
Feature no	F2856

FEATURE SYNOPSIS

This feature allows the customer to specify a delay between the receipt of the last calling digit at a TOPS office and the transmission (sending) of coin signals by the TOPS office. This delay can be set on a trunk group basis.

FEATURE DESCRIPTION

The telco can set this delay on trunk group basis. It has been added to a table - TOPSCOIN - a default of 750 msec has been supplied, however, the delay ranges from 0 to 2 seconds in 10 msec increments.

With this new table three coin parameters were moved from table trunkgroup (TRKGRP) into table TOPSCOIN. The three parameters are: Padstat0, padstat1, and coin type. Padstat0 and padstat1 are used to determine whether or not the keypad is enabled for 0+, 0- and 1+ coin calls. The keypad was left in this state by the end office. A coin signal is not sent if digitone keypad is already in required state. The coin type is used to specify the coin phones (ccf and cdf) which route to the trunk group.

Ref: AF0073

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL CONNECTED TO A TOPS POS
Feature	NPA ON 0+ SEVEN DIGIT LOCAL CALLS
Feature no	F2887

FEATURE SYNOPSIS

Normally, local area calling is within a single numbering plan area (NPA), commonly referred to as an area code. However, certain metropolitan areas reside at the boundary between two or more NPAs, and provide local area calling between exchanges residing in multiple NPAs. This feature includes the called party's NPA in the automatic message accounting (AMA) record for local area calls which originate in either the same or another NPA.

FEATURE DESCRIPTION

A local calling area (LCA) is composed of those exchanges which may be dialled as non-toll calls from a given exchange. Normally a LCA resides within a single numbering plan area but certain metropolitan areas reside at the boundary between five MPAs and provide local area calling between exchanges residing in multiple NPAs.

When a subscriber dials a 0+ seven digit local area call (0+NXX-XXXX) the call is routed to DMS-200 TOPS office for operator assistance and billing. Existing translation in the TOPS switch allow proper routing of local area calls, whether within the HNPA or to a FNPA. However, automatic message accounting (AMA) billing record produced shows only seven digits, no the called NPA. The operating company cannot determine the called parties from the AMA record. This feature prefixes the correct called party's NPA, although not dialled, in AMA record for use in downstream billing.

Ref: AF0171

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	TOPS CALL PROCESSING
Feature	COIN FIRST-RETURN ON DISCONNECT
Feature no	F2918

FEATURE SYNOPSIS

This feature enhances coin control capability in DMS TOPS so that a coin return signal can be returned upon disconnect of a call dialled 950-WXXX or 800-WXX-XXXX. It also enhances the software so that path enables signals for these call types are only sent when required.

FEATURE DESCRIPTION

On calls dialled 1-950-WXXX or 1-800-NXX-XXXX, customers on occasion are prompted to enter a subsequent string of called digits by a second dial tone. In order to do so, the customer must place the call with a DTMF phone and the DTMF keypad must remain enabled after the first set of digits are dialled. This presents a problem with the coin phones (coin first - CCF, dial tone first CDF), since the normal end office practice for 1+ coin calls is to disable the DTMF keypad.

i) CCF Coin Phones (Coin Coin First):

In order to allow second dial tone calls from CCF phones, modifications have been made to the end offices to which these phones are connected. This is done by software modifications to TOPS to send a coin return signal upon termination of a call. Telco must first route the calls to a TOPS access tandem via a TOPS trunk group. New parameter CCFCNRET, in table TOPS COIN must be set to Y, for corresponding incoming TOPS trunks.

ii) CDF Coin Phonse (Coin Dial Tone First):

In order to enable the DTMF key pad for coin calls, a telco must route these calls to TOPS access tandem and then ensure that the calls are routed to an outgoing route list, which contains TOPSCOINENABLE filled in the route list. Enable signal is sent to the originating end office which enables the DTMF key pad of the calling party. Once the signalling is completed, the TOPS software then connects the calling party to outgoing trunk.

Two new pad state parameters (PADSTATB + PADSTAT8) are provided since end offices may disable the DTMF key pad for one call type and not the other.

Ref: GFX030CC05.03, AL0418

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL PROCESSING
Feature	TOPS CROSSBAR SIGNALLING
Feature no	F2958

FEATURE SYNOPSIS

This feature, TOPS Crossbar Signalling, allows the TOPS switch to optionally accept an Automatic Number Identification (ANI) digit string, in the case of Operator Number Identification (ONI) and ANI-failure calls, without the start (ST) signal that closes the ANI spill. This feature is provided to accommodate the No. 5 crossbar signalling system, which does not provide the ST signal on ONI and ANI failure calls. Such calls from the No. 5 crossbar system previously had the potential for the corruption of the received ANI spill, resulting in the failure of the digits collection and the logging of an ANI reception trouble MORE_THAN_TWO_FREQS.

FEATURE DESCRIPTION

The TOPS Crossbar signalling feature permits the specification that the ST signal on the ANI spill for ONI and ANI failure calls is not required. This feature may optionally be allowed or inhibited - on a trunk group basis via trunk group datafill. The feature will prevent the possibility of ANI digits collection failure, due to transient noise, on ANI failure and ONI calls from the crossbar No. 5 system. Note that this feature only pertains to cases of Bell multi-frequency (MF) signalling. Dial pulse (DP) signalling cannot omit the ST pulse because call type information is contained therein.

When the digits receiver is set up to collect digits, if the table TRKGRP field STNOWAIT is found to have been set to "Y", then the peripheral will be instructed to examine the received ANI digits after only two have been collected. If the second digit, the ANI information digit, indicates that it is an ONI or ANI failure call, then no attempt is made to collect additional digits and the collected digits are returned to the CC. The CC appends the missing ST pulse and processing continues normally.

Alternatively, if when the digits receiver is set up to collect digits the field STNOWAIT is found to have been set to "N", then the peripheral is not instructed to analyze the digit string after only two have been collected. If the call is an ONI or ANI failure, and the ST pulse is not forthcoming, then the digits collection will either timeout or be corrupted by transient noise before the timeout. As before, an instance of noise corruption results in the logging of the ANI reception trouble (TRK118) MORE_THAN_TWO_FREQS trouble code, and a timeout on an ANI failure call results in the logging of the ANI reception trouble (TRK118) ANI_OFFICE_FAILURE trouble code.

There is also implemented some table control for trunk group and subgroup data, intended to inhibit the writing of conflicting datafill (i.e., STNOWAIT = "Y" and "DP" signalling are mutually exclusive).

Ref: AF0720

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	TOPS - KEY FUNCTION ENHANCEMENTS
Feature no	F3716

FEATURE SYNOPSIS

The purpose of this feature is to reduce the instances where invalid billing numbers are being recorded on AMA tape from TOPS calls. At the present time the AMA system records the calling and called numbers as they appear in the TOPS RECORDING UNIT at call completion. Since the operator has the ability to change billing numbers during the call there are cases where the numbers recorded may not accurately reflect the parties actually involved in the call. Improvements are made in the following two ways:

- 1) Remove the unnecessary situations where the operator can change a number which may be involved in a billable call.
- 2) Record on AMA tape the instances when these numbers have been overwritten and the new number is never involved in a connection.

FEATURE DESCRIPTION

KEY FUNCTION CHANGES

Key function changes have been added to remove from the operator the power to change billing numbers when it is not necessary. Key function changes will be broken up into two groups, those that modify the back number and those which modify the forward number.

Back Number

The changing of an ani success back number once it has been involved in a connection with the operator will not be permitted. A back number entered but never connected to the operator may be changed. Ani fail or oni back numbers may be changed at any time and more than once if required. The effect of the following groups of keying sequences will be changed:

RLS BK

While a forward connection is in effect, the RLS BK key will fail to release the back party.

The RLS BK + ST sequence will still break and then establish a back connection (provided no forward party is connected). The back number will be marked as

ANI SUCCESS, even if it was originally an ONI number.

RLS BK + KP BK + D + ST
RLS BK + KP BK + D + NO CONN + ST

Assumes a back connection existed before either of these keying sequences.

Both keying sequences will release the back party but fail to change the back number and fail to establish a back connection.

The operator can reach the back party by keying START.

NOTE: Another method must be found to enter back numbers on trouble reports. A manual ticket can be filled out or the other loop can be accessed.

KP BK + ST

This sequence will not erase the back number, if that number could have been involved in a billable call. A back flashing number will be erased.

NO CONNECT KEY

The NO CONNECT key can be used in conjunction with the back loop only if the call is a delay call with no back party connected and RLS BK is not in effect. The operator can change the back number with the NO CONNECT key until she connects to a back party by keying START or KP BK + D + START.

Forward Number

A forward number may not be entered after the breaking of a back connection. A forward number may never be erased. The result of the following keying sequences will be changed:

RLS BK + KP FWD + D + ST
RLS BK + KP OVS + D + ST
RLS BK + KP VFY + D + ST

Assumes a back connection existed before any of the

keying sequences.

These keying sequences will release the back party but fail to change the forward number and fail to establish a forward connection.

The operator can reach the back party again, by keying START.

KP FWD + ST
KP OVS + ST

These sequences will not erase the forward number, if that number could have been involved in a billable call. A forward flashing number can be erased.

Establishing a different forward connection and/or overwriting a forward number are still permitted under the conditions outlined in the next section.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	TOPS - AMA RECORDS VERIFICATION
Feature no	F3718

FEATURE SYNOPSIS

This feature provides an AMA record for each line verification made by an operator. The AMA record includes the calling and called numbers, the operator number and team numbers and the time period the operator was connected to a forward party.

The AMA record used will be the standard NT TOPS F1 format. There will be one extra AMA record associated with a call for each verification attempt that connects to a forward party.

FEATURE DESCRIPTION

Presently each TOPS call can have several AMA entries associated with it. The first entry will always be of the F1 or F3 type. Extra entries physically follow the initial entry on tape. VERIFICATION records will always follow the initial AMA record on tape and are listed in the same order they were made by the operator. VERIFICATION records may be distinguished from the initial AMA entry in that they are never chargeable.

In order that this feature easily interfaces with current TOPS software, there will be no physical changes made to either the AMA format used or the logs. Most fields in the extra records are the same as the initial entry. The fields changed logically or are of interest are:

a) Information Digit 1

For verification calls the only possible entries are 0, 1, 4 or 5 since the calls are non-chargeable.

b) Calling Number

This entry will be blank except the calling party is physically connected to the call when the VERIFICATION AMA record is formed.

c) Called Number

Records number being verified by the operator and keyed in by the operator.

d) Date and Time

e) Conversation Time

f) TOPS Operator Number

g) TOPS Team Number

h) Information Digit 3

The only possible entries are 2, 3, 6 or 7 since the VERIFICATION flag must be set.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	TOPS VERIFICATION SCRAMBLING & TONE OPTIONS
Feature no	F3720

FEATURE SYNOPSIS

This feature provides the KP VFY sequence to control a new circuit which scrambles speech or injects an alerting tone when a TOPS operator performs busy line verification.

FEATURE DESCRIPTION

This feature will prevent the operators from eavesdropping on subscribers using the current Busy Line Verification feature (KP VFY key).

The scrambler circuit is provided as a pair of trunks - an OG trunk to be connected to the operator and an IC trunk which in turn is connected to a trunk to the desired office. The actual voice scrambler and its control circuitry will be used to connect the OG trunk to the IC trunk in a loop back configuration.

When the operator keys in KP VFY, digits, START, the digits are translated using the pretranslator name in table OPRTRANS, entry VERIFY, which selects the OG group of the scrambler circuits (or routes to treatment).

The TOPS position will connect to a scrambler circuit, seize it and out-pulse the called number.

This will result in an origination on the IC trunk of the scramble cct. Its pretranslator selects a route to the end office which is appropriate for verification.

The TOPS operator will see the normal called supervision display and will either hear nothing or any tones which may be present. However, at this time the DMS TOPS would prevent the operator from talking to the parties being verified by controlling speech paths through the conference port. This is already done in the existing busy verification.

The operator can now report to the caller the actual status of the called line.

Now, if the operator keys in KP VFY, START, a wink is sent to the scrambler circuits OG trunk. This removes the scrambler from the voice path and transmits a burst of an alerting tone towards the verified subscriber - this tone repeats every 10 seconds so that even if the operator keeps quiet the subscriber is aware that the operator has barged in.

The initial implementation of this circuit will use 4-wire analogue trunks, with the actual scrambler and associated control circuitry on a miscellaneous equipment frame.

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	COIN FEATURES
Feature	TOPS - EXPANDED INBAND COIN CONTROL
Feature no	F3733

FEATURE DESCRIPTION

EXPANDED INBAND COIN CONTROL is a method of coin control and ringback signalling from the TOPS toll switch to the local central office when the originating subscriber is calling from a coin telephone.

Expanded inband is not a modification to the older inband coin control method, which remains unchanged and available for application. Rather, expanded inband is a new signalling protocol similar to inband, but with an expanded range of capabilities.

Expanded Inband Functions

In addition to the standard "coin collect", "coin return" and "ringback" functions, expanded inband also provides "operator released" (key-pad enable) and "operator attached" (key-pad disable) functions, which are required for the Mechanized Calling Card Service (MCCS) feature. Previously, only multiwink coin control provided this additional capability of key-pad control. And finally, expanded inband coin control is unique in its ability to request a combined "coin collect and operator released" function.

The new combined coin collect and operator released function is used when overtime coin calls which are still in the talking state are re-connected to an operator for collection of overtime charges. This provides some savings in both time and equipment usage over what would otherwise be incurred by sending two separate sequential signals.

Expanded Inband Signalling

Expanded inband coin control signalling is similar to inband coin control signalling in that an MF¹ digit tone is sent in the voiceband to the local central office. It is the value of the MF digit which identifies the particular control function that is desired. Since the MF tone is sent in-

¹ Multifrequency (MF) pulsing transmits digits which are various combinations of two out of six frequencies in the voiceband.

band, the local central office must be alerted beforehand to prepare a receiver. This is accomplished by preceding the tone with an on-hook wink².

Following the tone, a guard interval is required to allow time for the local central office to complete detection of the signal and to apply the requested control function to the coin telephone before any new signalling is initiated.

The timing specifications for the on-hook wink, post-wink delay, and tone duration for expanded inband signalling are shown in Table I. Refer to Table II for the MF digit and guard interval applied for the control function desired. Table III describes the frequency composition of standard MF digits.

Key-Pad Control

When an operator is attached to a coin call it is necessary to disable the key-pad. This prevents pad interference with or simulation of coin tones so that coin deposits can be audibly recognized by the operator. When the operator is released, the key-pad is re-enabled so that digits may be dialed by the subscriber if required.

Because of the above requirement the local central office normally connects a coin telephone to a TOPS outgoing trunk in the operator attached condition. However, when the TOPS outgoing trunk utilizes expanded inband coin control, the local central office connects the coin telephone in the operator released condition for 0+, 0- and non-chargeable call originations. The assumption is that Mechanized Calling Card Service (MCCS) may be provided by the TOPS switch, which requires the subscriber to dial a calling card.

² Since trunks are normally off-hook while in use, the wink is accomplished by going on-hook for a brief interval and then returning to the off-hook state.

Limitations

Although expanded inband coin control may be used on any TOPS trunk group, the operator attached and operator released functions cannot be applied by the local central office when the coin station is of the Coin-First (CCF) type. With these telephones, the pad is enabled only by the presence of an initial deposit equal to the local rate. Collection or return of the coins disables the pad. Consequently, the use of expanded inband coin control does not offer any advantage over the older inband method unless the coin telephone is of the Dial-Tone-First (CDF) type.

Interval	Expanded Inband	Inband ³
On-hook wink	325 - 425 ms	70 - 130 ms
Post-wink delay	770 - 850 ms	95 - 195 ms
Tone duration	480 - 700 ms	1000 ms ⁴

TABLE I: Expanded Inband Signalling Timing Specifications

Function	MF Digit	Guard Interval
Operator Released	#8	600 ms
Operator Attached	#0	600 ms
Coin Collect	#2	2000 ms
Coin Return	#13	2000 ms
Ringback	#11	2000 ms
Coin Collect and Operator Released	#15	2000 ms

TABLE II: Expanded Inband Coin Control Functions

³ Older inband signalling specifications are listed for comparison purposes.

⁴ 2000 ms for Ringback function.

MF Digit	Frequencies	Alias
#1	700 + 900 hz	
#2	700 + 1100 hz	
#3	900 + 1100 hz	
#4	700 + 1300 hz	
#5	900 + 1300 hz	
#6	1100 + 1300 hz	
#7	700 + 1500 hz	
#8	900 + 1500 hz	
#9	1100 + 1500 hz	
#0	1300 + 1500 hz	
#11	700 + 1700 hz	ST3P
#12	900 + 1700 hz	STP
#13	1100 + 1700 hz	KP, KP1
#14	1300 + 1700 hz	KP2, ST2P
#15	1500 + 1700 hz	ST

TABLE III: MF Digit Frequency Composition

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	TOPS OPERATIONAL MEASUREMENTS ENHANCEMENTS
Feature no	F5975

FEATURE SYNOPSIS

This feature provides R1 and R1 modified signalling (includes outpulsing of KP2, C11 and C12) for the Caribbean Expansion Programme (CEP) in the DMS-100I.

FEATURE DESCRIPTION

The R1 modified register signalling is a combination of R1 CCITT register signalling (Ref 1 and 3) and CCITT no. 5 register signalling requirements of Code 11, code 12, and KP2 register signals.

The software structure is changed, but not the operation of the R1 (MF3) register signalling transactor. This feature will require 10 bytes of data store for each R1 modified signalling tuple added. For additional information refer to CCITT recommendation Q310-331, Q140-Q152.

Ref: AE0034, BF0567, BF0564, BF0565

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	TOPS REALTIME ENHANCEMENTS
Feature no	F6164

FEATURE SYNOPSIS

Because of high complexity and many messages, TOPS calls place great demands upon the DMS system. This feature eliminates unnecessary operator key strokes and optimizes operator position screen update messaging in order to reduce system real time consumption during certain operator assisted or handled calls. Operator work time is also reduced for the call types affected.

FEATURE DESCRIPTION

This feature enhances system real time performance during traffic operator position system (TOPS) calls. Improvements include:

- elimination of the need to depress the start timing (ST TMG) key before keying position release (POS RLS) during most TOPS calls
- elimination of delayed outpulsing on an operating company definable basis
- automatic class charging of dial rate calls as station paid
- automatic class charging of 800 and Zenith calls as auto collect
- optimization of screen update messages between the central control (CC) and TOPS positions.

Besides enhancements for calls in a stand alone environment, there is greater real time savings in an operator centralization (OC) environment due to decreased messaging over the virtual circuits across which host and remote switches communicate.

Ref: AF0146

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
Feature set	ADMINISTRATION
Feature	TOPS OM ENHANCEMENTS - PHASE II
Feature no	F6166

FEATURE SYNOPSIS

This feature enhances the OMs to measure the call mix for each node in an operator centralization network. Also, the calls per hour in the activity OM must include the effects of OC attempts in the host. The call disposition summary report will also be enhanced to indicate the disposition of TOPS calls. The OM register for delayed calls are added.

FEATURE DESCRIPTION

The purpose of this feature is fourfold.

1. Implement operational measurements (OM) in an operator centralization (OC) office host and standalone to measure the traffic mix on a remote/host basis (main emphasis of this feature).
2. Include the OC/remote operator number identification (RONI) attempts in the host office activity report.
3. Enhance the call disposition summary report to reflect advances made in the traffic operator position system (TOPS) OMs.
4. Provide additional miscellaneous TOPS OMs.

Ref: AF0145

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL PROCESSING
Feature	TOPS MP DA/INT QUEUEING
Feature no	F6683

Synopsis

This feature expands the current TOPS queuing capability to provide separate queues for directory assistance (DA). This ensures that calls that require DA are only connected to positions and operators capable of providing directory services. In addition, calls that require DA services can be classified and positions and operators can be linked to the DA capability.

Implementation

Transfer and DA services can be activated and deactivated using commands from the FADS (force administration data system) or SADS (system administration data system) TTY (teletype)

Parameter TOPS_NUM_TRANSFER_TYPES is eliminated from table OFCENG. Parameter TOPS_TRANSFER_TYPES is added to provide independent transfer and DA services. Before removing a transfer or DA from TOPS_TRANSFER_TYPES, it must be removed from tables TOPS, XFROPSSEL, OGTMPKEY, and OGTSPKEY.

Fields POSTYPE in table TOPS, XFRSET in table TOPSPOS and XFRSET in table OPRDAT can now include DA as an option.

New OM group TOPSPSZ (TOPS Position Seizures) counts the number of TOPS position seizures.

New OM group TOPSQS (TOPSQueueS) pegs TOPS queue activity.

OM groups TOPSIPS and TOPSQ are eliminated. These are replaced by the two new OM groups introduced by this feature.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX801AA TOLL Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

Systems such as AUTOVON, MERCURY, and OOC may display aspects of the DA feature even though they do not have the DA capabilities.

Limitations

Calls can only be assigned one transfer or DA service at the time.

Transfer or DA services which are datafilled in table TOPS or XFROPSEL cannot be deactivated.

Reference: FDOC AF0476

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB)
Feature set	CALL PROCESSING
Feature	TOPS MP FORCE MANAGEMENT CONTROLS AND FADS
Feature no	F6684

Synopsis

This feature provides operating companies with the necessary control and reporting mechanisms to handle directory assistance (DA) and TOLL operator forces. The current TOPS force management capability is extended to provide control over the DA queue. Information on the DA queue is added to force management reports.

This feature introduces the following changes:

- * FADS (force administration data system), TADS (TOPS administration data system) and SADS (system administration data system) TTY commands and responses now handle DA.
- * Assistance (AP), in-charge (IC) and force manager's cathode ray tube (FMCRT) now display calls waiting, calls deflected, and position occupancy indicators for DA.
- * MFADS (mechanized force administration data system) now handles output of DA statistics.

Implementation

New office parameter TOPS_MFADS_OUTPUT_XFR_NUMBER specifies whether new fields indicating the number of the XFR type are output and whether the DA data is output to MFADS. This parameter can take values 'Y' or 'N'. It should be 'N' in AUTOVON and DMS250 offices.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX801AA TOLL Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

Changes in FADS TTY reports (FADS, TADS, SADS) and screen displays are visible for AUTOVON, DMS250, and OOC even though they do not have the capabilities provided by this feature.

Limitations

A maximum of ten TOs (traffic offices) can be datafilled to permit all reports to be generated at 300 Baud.

A maximum of seven TOs can be datafilled with DA capability.

Reference: FDOC AF0477

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL PROCESSING
Feature	TOPS MP TRUNKING
Feature no	F6950

Synopsis

With this feature, directory assistance (DA) traffic can be handled by TOPS directly, rather than by a separate auxiliary operator services system (AOSS) package. Call processing changes are introduced to support trunking of directory assistance calls to the DMS-200 TOPS MP. This feature adds Numbering Plan Area call origination types 555-Home and 555-Foreign to existing call origination types 411, 555, and Intercept. TOPS trunk group data allow DA calls to be delivered to and handled by TOPS MP operator positions.

Implementation

This feature introduces the following codes:

- * TOPSOIC (TOPS Office Identification Code) specifies valid OIC codes received from an end office over a TOPS trunk group.
- * OICBC (Office Identification Code Billing Code) is used to verify the calling NXX code as a valid billing code for AMA and specify a charge class for the call.
- * DABILL (DA BILLing) is used to indicate those types of calls that can be billed, based on prevailing tariffs. Data in table DABILL is used only if BILLRQD field for the trunk group in table DATRKOPT indicates that the TOPS office is responsible for billing.

Tables TOPS, CLASSDEF, and FMCALLTYP can now include new CO types HOM555 and FOR555.

Table TRKGRP field STATCLAS now includes DA and OIC.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX801AA Toll Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0478

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL PROCESSING
Feature	TOPS MP EXPANDED OGT AND XFR KEY CAPABILITY
Feature no	F6951

Synopsis

This feature is part of the package that incorporates the directory assistance capabilities of the auxiliary operator services system (AOSS) into TOPS. It implements the transfer to directory assistance function. It also provides unrestricted assignment of the current transfer function (XFR 1 and 2) and the outgoing trunk function to any outgoing trunk (OGT) key on the TOPS keyboard.

The improvements to the OGT keys make the assignment of XFR and outgoing trunk (OT) functions to OGT keys more flexible.

Implementation

Service analysis log SA201 is changed to distinguish between SP and MP OGT keys.

Service analysis OUTASST command is changed to distinguish between SP and MP OGT keys.

Table OGTKEY (OutGoing Trunk KEY) is removed. It is replaced by the following two tables:

* Table OGTSPKEY (OutGoing Trunk Single Purpose KEY) contains data for the seven OGT keys on the TOPS SP position.

* Table OGTMPKEY (OutGoing Trunk MultiPurpose KEY) contains data for up to 100 OGT keys on the TOPS MP position.

Data in these tables cannot be changed, only added or deleted. The range of key types is OT, XFR, and ASST. Field AMAINDEX in both tables is datafilled if field BILLNUM = 'N'. This indicates to AMA that the called number should not be included in the AMA record.

Two new OM groups OGTSP and OGTMP replace seven registers in TOPSMISC. Registers count the number of times that an OGT MP or OGT SP key is struck.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTX801AA Toll Features I

Activation and Deactivation

Without the DA Feature Package, this feature provides the flexibility to assign valid XFR and ASST functions to OGT keys, but does not implement the XFR DA function.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Duplicate tables OGTMPKEY and OGTSPKEY must be maintained in the TOPS Controller (TPS) and Maintenance Position (TAMI). These tables must be the same in order to ensure correct key execution.

The ASST key cannot be datafilled in Table OGTSPKEY. An error message results if this is attempted.

Only one ASST can be assigned for OGT keys in Table OGTMPKEY. An error message results if an attempt is made to assign more than one.

Only XFR types datafilled in TOPS_TRANSFER_TYPES can be assigned to an OGT key in both OGTMPKEY and OGTSPKEY. An error message results if an error is made.

Only one XFR key can be assigned in either OGTMPKEY or OGTSPKEY for each XFR type in TOPS_TRANSFER_TYPES. An error message results if an error is made.

Customer screening is not allowed for an OT function at an Overseas Operator Center (OOC)

Reference: FDOC AF0479

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	CALL PROCESSING
Feature	TOPS MP KEY FUNCTIONS AND SCREEN UPDATES
Feature no	F6955

Synopsis

This feature integrates call billing functions onto the same terminal that serves as the directory assistance (DA) terminal, reducing equipment requirements and increasing operator efficiency for the operating company. In addition, this feature allows billing on a per call basis, which offers the potential for new revenue sources.

This feature introduces the two new screens that the TOPS MP uses to accomplish billing for directory assistance calls: the DA Search Screen, which displays the listed database, and the DA Billing Screen, which is used to enter billing data. New keying functions required to complete the billing information are also included.

Descriptions of the manual DA billing function for the following types of calls are provided:

- * Local 411 calls
- * 555-1212 DA calls
- * 131 DA calls
- * Toll and Assist (TA) calls requesting DA

Implementation

Table DABILL has two new fields. ENHAMA is set to 'Y' to append the DA module to the AMA record for billing DA an Intercept calls. CCSURCHG is set to 'Y' to apply a surcharge for the completion of a DA or Intercept call.

New table DACCSUR contains the amount of surcharge to apply to a DA or Intercept call. The charge can be based on the originating class of service.

New table DACCSURI is a duplicate of DACCSUR, used by MASSTC.

The MASSTC CI command now includes table DACCSUR.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX801AA TOLL Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF0482

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	ADMINISTRATION
Feature	TOPS BASE MMI CHANGES ENHANCEMENTS
Feature no	F7095

FEATURE SYNOPSIS

This feature documents changes made to the TOPS base man machine interface (MMI) to support optional features and future developments.

FEATURE DESCRIPTION

The following changes have been made to the TOPS base MMI:

- The operator data (OPRDAT) table is extended to store the service profile of each operator (OPR). Table TOPS Position (TOPSPOS) is extended to indicate the service capability set of each assistance (ASST), in-charge (IC), and OPR position.
- The Force Administration and Data System (FADS) list operator transfer capabilities ("X") command is extended to provide data regarding all operators in a TO, including non-transfer only operators.

Note that "NON XFR" and "GEN" are used interchangeably in the sections which follow. Both refer to the non-transfer ("General") queue.

Ref: AF1076

Package	NTX030CC10 TOPS CALL PROCESSING FEATURES (UPG. OF NTC030CB
Feature set	SWITCHING AND TRANSLATIONS
Feature	EXPANDED FXDNMAP
Feature no	G0007

FEATURE SYNOPSIS

Expanded FXDNMAP enables the substitution of true billing numbers for Foreign Exchange (FX) line numbers on restricted calls (hospital, inmate etc), coming through FX lines and arriving at groups. This will allow Telcos to bill charges in an FX type call from a restricted station with respect to a correct DN for Bell, OSS, EAOSS, and AMR5 signalling types.

FEATURE DESCRIPTION

The expanded FSDNMAP feature provides for true billing number substitution on FX type calls from all restricted stations including restricted coin stations. The FSDNMAP table will have to be datafilled to map the FX numbers to the actual restricted numbers. Restricted calls can arrive at TOPS either on RESTBIL or DNLOOKUP trunks with ANI ID 0 or over COMBINED, RESTBIL, or NONCOIN trunks with ANI ID 7. Therefore, the FXDNMAP will now be screened on all restricted calls arriving through RESTBIL or DNLOOKUP trunks with ANI ID 0 or over COMBINED, RESTBIL or NONCOIN trunks with ANI ID 7. This is in addition to hotel call screening.

FX type restricted calls that arrive through RESTBIL or DNLOOKUP trunks with ANI ID 0 or on COMBINED, RESTBIL or NONCOIN trunks with ANI ID 7, screen through table SPLDNID (for determination of the class of service type for billing) prior to screening through table FXDNMAP. Therefore, as in the case of hotel calls, the FX numbers must be datafilled in table SPLDNID. The actual numbers must also be filled in table SPLDNID since the actual number is entered by the operator during ANI failure.

Similarly, the NPA+NXN of both the EOs have to be datafilled in table TOPSBC for correct verification during both, ANI success and ANI failure. A sample datafill of tables TOPSBC, SPLDNID, RESTBIL and FXDNMAP for restricted lines.

Ref: AL0610

NTX035AA03 Status: RTM TOPS REMOTE CAMA

TOPS	:	
RONI /CKO FUNCTION		F2172
REMOTE ONI VIA O.C.		F2602

Package	NTX035AA03 TOPS REMOTE CAMA
Feature set	TOPS
Feature	RONI /CKO FUNCTION
Feature no	F2172

DESCRIPTION

TOPS operators or CAMA board operators are required to collect the calling customer telephone number on ONI (Operator Number Identification) calls or calls where the ANI (Automatic Number Identification) equipment has failed. This number is included in the initial entry on AMA (Automatic Message Accounting) billing tape.

In a TOPS remote operator number identification arrangement, calls requiring a CAMA operator (ONI or ANI Fail) at a Toll office will be routed to a distant TOPS complex where a TOPS operator will collect the calling number and release the call. The number will be outpulsed back to the toll office for validity checks. If the number does not pass these tests, the call will return to a distant TOPS operator as a RONI recall and a subsequent attempt to collect the correct number will be made. The RONI recall will not leave the position until the operator has collected the correct calling number or terminates the call. Once the correct number has been collected control passes back to the toll office and the call floats.

This feature is necessary when the toll office does not have CAMA or TOPS positions of its own, or these devices have been shut down.

Note that the toll office may be any type of switch (e.g. 4A, XBT, SP-1 4W, SP-1 2/4W, 5XB, etc.).

The toll office and the TOPS office will communicate via on/off hook supervision signals on two trunks - a data trunk and a voice trunk. Information about the call type (ONI or ANI Fail) will be transmitted as 480 Hz tone bursts over the voice trunk. The collected digits will be outpulsed to the toll office over the data trunk. The voice and data trunks will be data filled separately although trunk member table control will enforce an assignment rule (e.g. both trunks must be consecutive on a card where voice = odd circuit number and data = even circuit number). This assignment rule will be used to post the voice or data side at the TTP. RONI signalling options will be defined in the trunk group table. Trunk subgroup table control will be the same as standard trunks.

Tone detector (NT5X29AB) is used to collect the 480 Hz tone bursts from the CAMA office. This circuit will be switched through the network when required and provisioned as a service circuit.

Package	NTX035AA03 TOPS REMOTE CAMA
Feature set	TOPS
Feature	REMOTE ONI VIA O.C.
Feature no	F2602

FEATURE SYNOPSIS

Remote Operator Number Identification (RONI) is provided on an office equipped with the operator centralization (OC) remote package.

FEATURE DESCRIPTION

This feature will make RONI compatible with the OC environment as well as standalone.

The method applied here is the concept of gating. Instead of duplicating everything for each environment a 'gate' is added in common code to access environmental specific functions.

The two environments in TOPS are:

- stand alone
- centralized

A table is set up to be indexed by environment and the type of function to be performed.

NTX036AA01 Status: RTM TOPS INWARD VALIDATION

TOPS :
INWARD VALIDATION F2360

Package	NTX036AA01 TOPS INWARD VALIDATION
Feature set	TOPS
Feature	INWARD VALIDATION
Feature no	F2360

FEATURE SYNOPSIS

Presently all U.S. and Canadian credit cards are comprised of a 14 digit number. The first 10 digits are the billing number and the last 4 digits are now made up of the (RAOD) Revenue Accounting Office Code and Check Digit. For the purpose of this description, this credit card will be referred to as RAO type credit card.

With the universal introduction by AT&T of Calling Card Services (CCS) planned for 1983, the format will remain the same, but the last four digits of U.S. cards will become (PIN) Personal Identification Numbers. PIN numbers will be generated randomly, leaving no way to validate U.S. credit cards except by accessing AT&T Billing Validation Data Bases. This type of credit card will be referred to as PIN type credit card, or more generally ABC (or CCS) billing number.

Inward validation feature in DMS-TOPS allows validation of PIN type credit cards through the use of a dial-up procedure from a DMS-TOPS office not equipped with direct connection to the CCIS network and therefore, no direct access to the Billing Validation Data as a node to the CCIS network. The TOPS operator keys in the PIN type credit card number and as a result receives a spoken report on the validity of the number and proceeds accordingly. The access trunk is the usual intertoll trunk connecting the DMS-TOPS and the TSPS office.

FEATURE DESCRIPTION

Operation of the Inward Validation feature is as follows:

Tops operator obtains credit card number verbally from subscriber.

Tops operator presses KP SPL key and enters the 14 digit credit card number + ST.

If the credit card is a PIN type credit card, the TOPS CRT displays VFY as an indication that the credit card may only be validated by accessing the Centralized Data Base.

TOPS operator in response to VFY indication, keys RLS FWD + OGT key assigned to validation route.

The DMS seizes an intertoll trunk and outpulses the inward code assigned to a validation port of the TSPS serving the originating office, i.e., KP + (NPA) + TTC + 1162 + ST.

The TSPS machine returns a prompt tone.

The TOPS operator keys KP SPL + ST in response to the tone and the DMS outpulses the 14 digit credit card number to the TSPS.

Voice exclusion is provided so that the calling subscriber will not hear the response from TSPS.

The TSPS then sends the credit card number to the AT&T Data Base for validation via the CCIS network.

The Data Base checks the credit card number for validity and returns an appropriate message over the CCIS network to the TSPS.

The TSPS interprets this message and returns an announcement to the TOPS operator to indicate non-valid, valid, restricted, non-restricted and RAO number when known.

If the credit card is acceptable, the TOPS operator will key RLS FWD, which drops the connection to the TSPS and removes the voice exclusion from the calling subscriber. TOPS operator then keys KP FWD + ST. which initiates outpulsing of the called number.

If the credit card number is invalid or is restricted, the TOPS operator will key RLS FWD and provide a verbal response to the calling subscriber, as determined by local operating procedures.

Notes

- a. The above procedure applies to mechanized Calling Card Number Validation using the inward code 1162 and MF signalling, and is provided as an optional package (NTX036AA). Where package NTX036AA is not provided, the TOPS operator is still able to verify the credit cards verbally by calling TSPS operators using inward code 1160. This feature is part of TOPS Basic package (NTX030AA).
- b. This feature allows TOPS operators to use both the present check digit method of validating credit card numbers and the external data base method introduced by AT&T. Either of two methods is possible: the check digit approach may be retained for some numbers (eg Canadian and Carribean), in which case the letters VFY display will never appear. In either case, validation using the external data base is initiated by the operator first establishing a connection to the data base and the keying KP SPL, START to cause the special number to be

outpulsed. The operator then receives a spoken report on the validity of the number and proceeds accordingly.

References

AT&T TA 62.

Package	NTX039AA01 HOST OC DATA - LINK HANDLING
Feature set	TOPS
Feature	OPERATOR CENTRALIZATION - HOST
Feature no	F0559

FEATURE SYNOPSIS
-----FEATURE DESCRIPTION

OC (Operator Centralization) is a feature which allows a single DMS TOPS switch (the HOST) to provide operator services for several remote DMS toll switches (the REMOTES). Communication between the Host and the Remotes is by means of digital data links (2 for reliability) and digital or analog voice links (provisionable).

The facilities which are provided at the Host are:

- a. Call distribution and queuing - Receive request for operators, assign voice channel when idle operator is available, instruct the Remote to return tone or announcements if Calls Deflected treatment is invoked.
- b. Operator functions - provide operator functions appropriate to the class of call in exactly the same way as a normal TOPS office. Send all operator keying responses to the Remote Office for processing.
- c. Management System - provide single team or multi team management system which includes assistance, monitoring, in-charge with position status and traffic data display.
- d. SOST functions - route special operator calls (e.g. delay) over special high usage route between the HOST and the Remote set aside for this type of traffic.
- e. Operational Measurements - provides OM for the operator centralization data and voice links.

It is to be noted that a Remote Switch will not support RONI trunks. All RONI Services for an OC configuration must be provided using RONI trunks terminating on the HOST.

NTX040AA03 Status: RTM COMMON CHANNEL INTEROFFICE SIGNALLING -

INTERWORKING	:	
CCIS - TOPS INTERWORKING		F1246
FACILITIES	:	
CCIS - SIGNALLING TERMINAL		F1793
MAINTENANCE AND TESTING	:	
CCIS - DATA EXTRACTION/INSERTION		F3153
SERVICE	:	
MSB6 NEW STI CARD SUPPORT		F5499

Package	NTX040AA03 COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC
Feature set	INTERWORKING
Feature	CCIS - TOPS INTERWORKING
Feature no	F1246

FEATURE DESCRIPTION

This feature will allow TOPS positions to connect to outgoing CCIS trunks. The CCIS trunks will appear only on Digital Trunk Controllers (DTC) and will handle much of the interworking details within the PM. It is important to remember that all signals for CCIS trunks arrive over a data link connected to the far end office. This feature will function in the same way as regular TOPS to intertoll trunks with the exception that CCIS outgoing trunks can never receive a backward ring signal. CCIS trunks will however provide the Ring Forward signal (FOT). When CCIS trunks are connected to other circuits, the CCIS trunk must be informed how to handle received hook messages and received CSM changes. These are the hook messages received by CCIS INCOMING trunks:

- 1) Answer Charge (ANC)
- 2) Clear Back 1 (CB1)
- 3) Reanswer 1 (RA1)
- 4) Clear Back 2 (CB2)
- 5) Reanswer 2 (RA2)
- 6) Clear Back 3 (CB3)
- 7) Reanswer 3 (RA3)
- 8) Second Start Dial (SSD)

(See FDOC C0587)

Package	NTX040AA03 COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC
Feature set	FACILITIES
Feature	CCIS - SIGNALLING TERMINAL
Feature no	F1793

FEATURE SYNOPSIS

The implementation of the CCIS SO functions on the DMS 100 Family switches required the development of two hardware units. The Message Switch and Buffer CCIS6 (MSB 6) and the Signalling Terminals (ST) together with VF trunks and 2400 baud modems, interface the Switching Office (SO) to the CCIS network.

The CCIS SO functions are partitioned into four layers:

1. Signalling Data Link functions
2. Signalling Terminal functions
3. Signalling Network functions
4. User functions

The layer 2 functions are performed by the signalling terminals in the DMS 100 Family SO.

FEATURE DESCRIPTION

The ST is a single circuit pack housing two 8085 micro processors. One of these, the data link processor, is responsible for the modem interface, SU reception and CRC.

The other, the master processor, deals with synchronization, construction of SUs, some management functions and the Level 3 interface.

Signalling Terminal Functions

The signalling terminal is responsible for transmitting messages securely over the associated signalling link (i.e. in the sequence in which they were received and error free). Communication between the two level 2 functions at either end of the signalling link is synchronous, meaning that data flows continuously.

Data is transmitted over the signalling link in packets known as signal units (SU). An SU has a fixed length of 28 bits. Of these, 8 bits are used for cyclic redundancy check (for error detection), and the other 20 bits for message data.

The SUs are transmitted in blocks of 11. Each transmitted block is terminated by an acknowledgement unit (ACU), which acknowledges receipt of a block of SUs. The ACU identifies both the acknowledged block and the transmitted block, of which this ACU is a part. The ACU also contains a

bit for each of the eleven SUs making up the acknowledged block, to indicate correct reception of this SU. (Correct reception (i.e. error-free) means that the SU has passed the cyclic redundancy check).

When there is no message data waiting to be sent over the signalling link, blocks are padded with sync SUs. A synchronisation SU, which is also sent continuously when synchronisation with the far-end is lost, contains a defined (but not reserved) synchronisation pattern and the identity of the SU position in the block. Once the sync pattern is detected and the SU position known, then the ACU can be identified. The ACU contains the block identity. Synchronism has been re-established.

The functions at level 2 monitor the error rate of received SUs, and inform level 3 if the error rate exceeds a pre-defined threshold. Level 3 then initiates maintenance actions.

If an ACU is received indicating corruption of a previously transmitted SU, then the SU is repeated in the next block to be sent.

Package	NTX040AA03 COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC
Feature set	MAINTENANCE AND TESTING
Feature	CCIS - DATA EXTRACTION/INSERTION
Feature no	F3153

FEATURE SYNOPSIS

DESCRIPTION

This feature meets the CCIS application requirements for the "Improved BCS Application" (or Warm Swact) project. The CCIS signalling system is now able to immediately convey signalling traffic for trunks, when the call processing is resumed on the BCSn+ side. The feature satisfies the following 2 conditions :

- 1) the swact to the BCSn+ side does not bring down any CCIS signalling link that is synchronized and active on the BCSn side.
- 2) the IPML's, which are the two nailed up connections between the MSB and the DTC, are maintained across the BCS swact.

A CCIS signalling link consists of a ST, modem and transfer link. The transfer link may terminate on a TM, DCM or DTC and is connected through the network to a TM which hosts a trunk card. The trunk card, also called a modem interface card is hard-wired to a modem which in turn is hard-wired to a signalling terminal (ST). Signalling reliability is provided by duplication of the signalling transmission facilities. When the link attains synchronism and becomes active the identity of the transmission link is stored in protected data and the connection is nailed up. On a cold restart the link is rebuild based on the protected information and is therefore maintained in synchronism.

Condition 1 is satisfied as follows:

1.0 BCSn Side

- i) Extracting Data
 - get nailed up network connection information
 - get protected link configuration data

2.0 BCSn+ side

- i) Insert Data (before Cold Restart)
 - restore network connection information
 - set nailed up connections
 - restore protected link configuration
- ii) Allocate ST and Link the Tids (during Cold Restart).
- iii) Set the Bit Maps (after the Cold Restart)

In order to satisfy condition 2 the nailed up connection information is passed from the BCSn to the BCSn+ side. This is done before the cold restart at the exchange step of the warm swact process. The IPML software stores a protected indication which reflects whether a nailed up connection exists or not. As the network information is passed to and updated on the BCSn+ side this indication will be updated to reflect that a connection exists. On the cold restart of the BCSn+ side the IPML software will cycle through all IPMLs and for any IPML that is not offline but has no network connection will make a network connection. Thus CCIS6 signalling links are not lost during BCS swact.

Package	NTX040AA03 COMMON CHANNEL INTEROFFICE SIGNALLING - BASIC
Feature set	SERVICE
Feature	MSB6 NEW STI CARD SUPPORT
Feature no	F5499

FEATURE SYNOPSIS

This feature implements changes to the ST maintenance software so that new STI card designed for MSB7 can also be used in MSB6.

FEATURE DESCRIPTION

Northern Telecom currently produces four types of STI cards MSB. The NT6X68AA and AB cards are equipped in the MSB6, and the NT6X68AC and AD cards are used for the MSB7.

By ignoring the digital multiplexing circuitry in the NT6X68AC (AD) it is possible to use it in an MSB6. NT wishes to do this thus making the NT6X68AA (AB) card obsolete.

Ref: DDOC BC1506

NTX041AA07 Status: A+M CCS7 - MTP/SCCP(UPG. BY NTX041AB)

MAINTENANCE AND TESTING	:	
CCS7 ST COMMISSIONING LOAD		F3997
CCS7 - MSB COMMISSIONING LOAD		F3998
SIGNALING AND SUPERVISION	:	
CCS7 - SIGNALING TERMINAL		F5510
SERVICE	:	
CCS7 LINK SET MGMT		F5667
CCS7 ROUTE SET MGMT		F5668
SCCP		F5771
MTP - CONGESTION/TIMER OPTION TABLE CONTROL		F5786
CCS7 BASE		F5791
SERVICES	:	
MTP ROBUSTNESS IMPROVEMENT		F5792
SERVICE	:	
SCCP-AUDITS AND ENHANCEMENTS		F6212
MAINTENANCE AND TSTING	:	
CCS7 BCS INSERTION		F6214
SERVICE	:	
MTP - CONGESTION/TIMER		F6241
MAINTENANCE AND TSTING	:	
MTP - DISTRIBUTED DATA MGMT		F6267
SERVICE	:	
MTP - DISTRIBUTED LINK/ROUTE STATUS CHANGES		F6268
SCCP - SCP ACCESS	:	
SCCP - FOR DMS SCP		F6301
MM1	:	
SCCP - MMI EVOLUTION FOR STP		F6457

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	MAINTENANCE AND TESTING
Feature	CCS7 ST COMMISSIONING LOAD
Feature no	F3997

FEATURE SYNOPSIS

This feature provides a load for testing the hardware of the CCS7 signalling terminal (ST).

FEATURE DESCRIPTION

This feature is responsible for providing a signalling terminal firmware load for the commissioning of the new CCS7 ST card (NT6X66). The deliverables of this feature will be as follows:

- An EPROM for the data link processor (DLP) firmware
- An EPROM for the master processor (MP) firmware
- A load for the MP software.

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	MAINTENANCE AND TESTING
Feature	CCS7 - MSB COMMISSIONING LOAD
Feature no	F3998

FEATURE SYNOPSIS

To provide CCS7 MSB load for commissioning hardware.

FEATURE DESCRIPTION

This feature provides a commissioning load for the new XPM peripheral MSB7, used in the CCS7 project.

The following functions are provided by this feature:

- communication with CC via network link
- communication with CCS7 ST
- diagnostics for new components in MSB7
- maintenance facilities to allow CC control of the MSB.

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SIGNALING AND SUPERVISION
Feature	CCS7 - SIGNALING TERMINAL
Feature no	F5510

FEATURE SYNOPSIS

This feature provides signalling terminal (ST) features and its maintenance. The ST handles the layer 2 protocol functions in the CCS7 product.

FEATURE DESCRIPTION

This feature provides the following signalling terminal features in the CCS7 product:

1. CCS7 MSB ST Interface Handling:

This feature handles the communication between MSB MP and all STs.

2. CCS7 MSB ST/STAI Audits:

It provides an audit facility in the MSB7 to check the integrity of ST and STAI (signalling terminal access interface).

3. CCS7 - ST Firmware:

This feature provides basic ST features such as link synchronization.

4. CCS7 ST MP PRO/Congestion Control & Flow Control:

This ST feature provides the processor outage procedures which handles both local processor failures (CC or MSB) and remote processor failure. It also provides a set of procedures to handle congestion control at level 2.

5. CCS7 ST MP Buffer Retrieval:

The purpose of this feature is to allow the MSB7 (message switch and buffer 7) to retrieve CCS7 MSUs (message signalling units) from internal ST7 buffers. The MSUs retrieved would be those that have not yet been sent to, or acknowledged by, the remote end.

6. CCS7 ST DLP Transmit Handler:

This feature transmits #7 SU (signalling units) and keeps the link in sync.

Ref:

FDOCs:

BF0526
BF0529
BF0650
BF0454
BF0457
BF0450

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	CCS7 LINK SET MGMT
Feature no	F5667

FEATURE SYNOPSIS

This feature, CCS7 Linkset Management, represents the DMS implementation of Signalling Link Management (SLM) as specified by ANSI and CCITT Q.704.

FEATURE DESCRIPTION

The purpose of Linkset Management (LSM) is to maintain a certain number of synchronized links for a given linkset, and to restore signalling service in the event of link failure or other disruption in the signalling links or at signalling points.

Linkset Management provides functions to activate and deactivate individual signalling links. A link is activated in order to bring the link in service, and is deactivated in order to take the link out of service.

This feature provides the following functions:

- 1) Table definitions, table control targets, and table initialization in the CC.
- 2) Detailed design of the implementation of ccs7 level 3 functions to manage link sets and links.
- 3) Provides the link management process and finite state machine in the MSB7.
- 4) Provides the Man-Machine interface for linksets. includes MAP display and alarms.
- 5) Integrate special MSB7 channel allocation into general XPM channel allocation.

Ref:

FDOCs:

BC1813
BV2000
BC1807
BC1811
BF1025

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	CCS7 ROUTE SET MGMT
Feature no	F5668

FEATURE SYNOPSIS

This feature, CCS7 Route Set Management (RSM), represents the DMS implementation of Routeset Management as specified by ANSI and CCITT Q.704. CCS7 Routeset Management is responsible for moving signalling messages over the CCS7 signalling network, and it is responsible for the maintenance of the network.

Detail design of CCS7 MTP Route Set Management including the functions Signalling Message Handling, Signalling Traffic Mgmt, and Signalling Route Mgmt. Includes definition of base MTP for all CCITT #7 based signalling systems.

FEATURE DESCRIPTION

The Route Set Management feature provides the following functions:

- 1) Rerouting of CCS7 signalling traffic from a failed link (changeover) and to an RTS'd link (changeback) in the Message Switch & Buffer 7 (MSB7) peripheral environment.
- 2) Maintains integrity of CCS7 Linkset Management (LSM) and Routeset Management (RSM) and performs automatic procedures to correct and recover from failure.
- 3) Implements the table control required for defining and maintaining the concept of routesets within the DMS-100 implementation of the Common Channel Signalling 7 (CCS7), and for defining networks and their attributes within the CCS7 definition.
- 4) Provides primitive control in the CC of the routing resources available to the Router function.
- 5) Provides the function that routes S7 user messages into the signalling network.
- 6) Provides the function that receives S7 messages from the ST and distributes the messages to the S7 users.
- 7) Provides the MAP level interface to the S7 routeset resource. Allows craftsman to control routeset service.

Ref:

FDOCs:

BF0941
BF0942
BC1804
BV2001
BC1798
BC1799
BC1800
BC1803

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	SCCP
Feature no	F5771

FEATURE SYNOPSIS

This feature implements the signalling connection control part (SCCP) for a service switching point (SSP). In addition to basic circuit switched call control signalling, CCS7 provides support for advanced features including transaction capabilities such as database access for enhanced 800 series (E800). SCCP enhances the transport capabilities of the message transfer part (MTP) to provide the special capabilities required to support such services, and therefore users such as transaction capabilities application part/application (e.g., TCAP/E800) and ISDN User Part (ISDNUP).

FEATURE DESCRIPTION

A SCCP user is known as a subsystem (i.e., TCAP/E800, ISDNUP, etc). Associated with each subsystem within a CCS7 network is a unique subsystem number (SSN).

The two addressable entities in the CCS7 network are the point code (PC) and the subsystem. A PC is a node in the CCS7 network attainable via the signalling links of the network. A subsystem, resident at a PC, is a SCCP user or application which utilizes the network services provided by the SCCP and MTP.

The function of the MTP is to route messages through the network based on the point code (PC) and to manage the information on availability of these PCs. The function of the SCCP is to route messages through the network and within a node, based on SSN and to manage the information on availability of these SSNs.

The SCCP is divided into four functional units:

- SCCP Routing Control (SCRC)
- SCCP Connectionless Control (SCLC)
- SCCP Connection-Oriented Control (SCOC)
- SCCP Management (SCMG)

Connection-oriented control procedures are currently being defined by the standards organizations, and is not implemented in this feature.

SCCP implementation is based on Recommendation Q.711-Q.714 of the ANSI/ECSA T1X1.1 specifications.

Ref: FDOC BF0658

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	MTP - CONGESTION/TIMER OPTION TABLE CONTROL
Feature no	F5786

FEATURE SYNOPSIS

This feature provides the second phase of the CCS7 Message Transfer Part (MTP) on the DMS. In BCS-20, a limited subset of the MTP provided Associated Signaling plus the linkset management procedures needed for initial applications in the field. Following is the list of features provided in this implementation:

- 1) MTP - Quasi Associated Signaling
- 2) MTP - Congestion Handling
- 3) MTP - ST Pools for CCS7 Signaling Links
- 4) MTP - Point Code Routing Algorithm

FEATURE DESCRIPTION

- 1) MTP - Quasi Associated Signaling

This feature provides Quasi Associated Signaling capability to MTP for CCS7. It handles all the tasks associated with route availability by implementing the Quasi Associated software of Routeset Management.

- 2) MTP - Congestion Handling

This feature detects local CCS7 link congestion, and remote route congestion, and effects control to alleviate the congestion.

- 3) MTP - ST Pools for CCS7 Signaling Links

This feature provides the capability for dynamic allocation of Signaling Terminal (ST) resources to CCS7 signaling links from a "pool" of STs, at link activation time rather than a static allocation at datafill time.

- 4) MTP - Point Code Routing Algorithm

This feature enables route set selection for the purpose of routing CCS7 messages based on variable length (partial or full) destination point code in signaling networks based on ANSI specifications.

Message routing capability based on partial point code is required by application parts such as Transaction Capabilities ApplicationPart (TCAP) and Signaling Connection Control Part (SCCP).

Ref: FDOC AL0076, BC2291, BC2292, BC2293, BF1024

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	CCS7 BASE
Feature no	F5791

FEATURE SYNOPSIS

The purpose of this feature is to supply common utilities and data structures for the CCS7 product.

FEATURE DESCRIPTION

This feature provides utilities, channels and data structures common to all entities of CCS7, the MTP, ISDN, SCCP, TCAP and other users of CCS7.

The CCS7 base responsibilities can be summarized into the following categories:

1. Network Table:

A datafillable data structure exists in the C7 base to identify the C7 networks existing in the switch.

2. CCS7 MAP Level:

The CCS7 base subsystem contains maintenance and administration functions which are found to be common to more than one CCS user, and not specialized to one user such as the MTP. The functions usually include MMI, logs and table control.

3. Data Types:

Data types that would be used by all the user parts of CCS7 are placed in the CCS7 base.

4. Channels:

The underlying operating system interface to be used in this product is the transaction processing system (TPS) which provides all the channels. There are no contributions required at the CCS7 base level.

5. Logs:

The base establishes a logs system for use by the MTP and potentially special CCS users like SCCP and TCAP. It also defines one log report, the all purpose 'invalid message' log.

Ref:

FDOC BC1814

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICES
Feature	MTP ROBUSTNESS IMPROVEMENT
Feature no	F5792

FEATURE SYNOPSIS

This feature provides loadsharing of CCS7 traffic between links not belonging to the same linkset but within the same combined linkset.

FEATURE DESCRIPTION

Currently, linksets in a combined linkset loadshare traffic across its links independent of the mate linkset's links. As links fail the traffic of the failed link is distributed across the remaining working links within that linkset. Only the failure of the last link in a linkset will cause traffic formerly on the failed link to be diverted to another linkset within that routeset. In the case of combined linksets this would be the mate linkset. As links fail within a linkset there is a likelihood of congesting the remaining working links even though there may be alternative links available in the mate linkset to carry the excess capacity.

This feature provides loadsharing across linkset boundaries within a combined linkset. This means that the links of both linksets in a combined linkset will share the total traffic of the individual linksets.

Ref: DDOC BF0989

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	SCCP-AUDITS AND ENHANCEMENTS
Feature no	F6212

FEATURE SYNOPSIS

This feature provides audit for the SCCP tables. Enhance the speed and efficiency of SCCP in general.

FEATURE DESCRIPTION

This feature provides SCCP audit procedures. Also, data store requirements will be optimized by using dynamic store allocation for table C7NETSSN.

The SCCP audit will monitor the SCCP tables and report any inconsistencies detected using logs. The error will be corrected whenever possible. Certain situations may require manual intervention to correct.

The data store for table C7NETSSN will be allocated dynamically only as required. This will reduce the data store requirements by approximately 100 kbytes for an office with fewer than eight SCCP destination point code.

Ref: DDOC AC0107

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	MAINTENANCE AND TSTING
Feature	CCS7 BCS INSERTION
Feature no	F6214

FEATURE SYNOPSIS

This feature provides the capability to upgrade a BCS containing Common Channel Signalling No. 7 (CCS7) such that CCS7 services are available when call processing is resumed after the SWACT in the Central Control (CC) to the new BCS.

FEATURE DESCRIPTION

The broad objective of this feature is to have CCS7 services such as the Message Transfer Part (MTP), Signalling Connection Control Part (SCCP), and ISDN User Part (ISUP), be available when call processing is resumed on the BCSn+ side. This objective can be broken down into several distinct objectives.

1. The CCS7 MTP should be able to carry signalling traffic when call processing is resumed on the BCSn+ side after the CC SWACT.
2. The Inter PM Links (IPMLs) which are two nailed up network connections between the MSB7 and a DTC, should be kept in service across the BCS Insertion SWACT.
3. ISUP calls in a talking state are preserved.
4. SCCP service should be available for routing after the resumption of call processing on the BCSn+ side. This objective relies on objective 1. above to be satisfied.

Ref: DDOC BC2289

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	MTP - CONGESTION/TIMER
Feature no	F6241

FEATURE SYNOPSIS

This feature provides table control for congestion and timer values for CCS7 message transfer part.

FEATURE DESCRIPTION

This feature implements the table control required for defining and maintaining the timer and congestion threshold values used within the DMS-100 implementation of the CCS7.

Ref: DDOC BC2290

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	MAINTENANCE AND TSTING
Feature	MTP - DISTRIBUTED DATA MGMT
Feature no	F6267

FEATURE SYNOPSIS

This feature provides the generic mechanism for distributing CCS7 data to multiple nodes. this feature includes maintenance of Node/PM status & means for updating distributed static & dynamic data.

FEATURE DESCRIPTION

The distributed data manager provides a mechanism to update many common nodes in the DMS switch with the same information. The CC/CM is the source of the data.

The data manager will distribute any single data update to a collection of nodes pre-specified by the application, and will verify the distribution, if requested by the application to do so.

The data manager is responsible for downloading all the application's data on RTS of any node used by the application.

The data manager will audit every node over CC/CM restarts, and will engineer data downloading to nodes out of sync with the CC/CM

Although the data manager is being developed for the needs of the CCS7 STP/multi-MSB project, it is not CCS7 specific; it can be used by any application with distributed data needs.

Ref: AC0148

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SERVICE
Feature	MTP - DISTRIBUTED LINK/ROUTE STATUS CHANGES
Feature no	F6268

FEATURE SYNOPSIS

To provide changes required to support link changeover and changeback and rerouting procedures in a distributed CCS7 architecture. This evolution is in anticipation of the multi-MSB solution and the STP products.

FEATURE DESCRIPTION

In order to gain messaging capacity with existing hardware a multi-MSB solution is used. In the current design, more than one MSB can be used but CCS #7 table control precludes the distribution of links in a linkset or routesup 8a routeset across more than one MSB. Therefore, in the single MSB solution, CCS7 traffic is deterministically directed to an MSB. In the proposed multi-MSB solution each DMS node from which CCS #7 messages can originate must still direct outgoing CCS #7 messages to a single MSB but the selection of this MSB must dynamically react to changes in the availability of link and route resources.

This feature puts into place software which provides the basis for these nodes to maintain their own link and route status information based on information provided to them from Routeset Management in the CC for the purpose of routing to the correct MSB.

No new functionality is introduced in this feature. In BCS23, CCS #7 table control has not changed, still restricting the distribution of routesets and linksets over more than one MSB.

Ref: AC0149

Package	NTX041AA07 CCS7 - MTP/SCCP(UPG. BY NTX041AB)
Feature set	SCCP - SCP ACCESS
Feature	SCCP - FOR DMS SCP
Feature no	F6301

FEATURE SYNOPSIS

This feature provides the Signalling Connection Control Part (SCCP) layer of CCS7 protocol, for the DMS-SCP (Service Control Point).

FEATURE DESCRIPTION

This feature incorporates the following items:

- SCCP Management (SCMG) functionality to provide coordinated state change control (CSCC) and remote broadcast required for SCP operation.
- SCCP management for multiple instances of local subsystems.
- Changes to the local subsystem MAP level to reflect the new subsystem configuration within the DMS.
- The addition of a local subsystem table.
- The migration of the SCCP local routing functions from the CC to the MSB7.
- Changes to the SCCP local routing algorithm.

REF: DDOC AC0143

NTX041AB04 Status: RTM CCS7 - MTP/SCCP(UPG.OF NTX041AA)

MAINTENANCE AND TESTING	:	
CCS7 ST COMMISSIONING LOAD		F3997
CCS7 - MSB COMMISSIONING LOAD		F3998
SIGNALING AND SUPERVISION	:	
CCS7 - SIGNALING TERMINAL		F5510
SERVICE	:	
CCS7 LINK SET MGMT		F5667
CCS7 ROUTE SET MGMT		F5668
SCCP		F5771
MTP - CONGESTION/TIMER OPTION TABLE CONTROL		F5786
CCS7 BASE		F5791
SERVICES	:	
MTP ROBUSTNESS IMPROVEMENT		F5792
SERVICE	:	
SCCP-AUDITS AND ENHANCEMENTS		F6212
MAINTENANCE AND TSTING	:	
CCS7 BCS INSERTION		F6214
SERVICE	:	
MTP - CONGESTION/TIMER		F6241
MAINTENANCE AND TSTING	:	
MTP - DISTRIBUTED DATA MGMT		F6267
SERVICE	:	
MTP - DISTRIBUTED LINK/ROUTE STATUS CHANGES		F6268
MULTI(4) - MSB7 CAPABILITY		F6269
SCCP - SCP ACCESS	:	
SCCP - FOR DMS SCP		F6301
MMI	:	
SCCP - MMI EVOLUTION FOR STP		F6457
ROBUSTNESS	:	
MTP - ROBUSTNESS IMPROVEMENTS		F6697
SCCP MANAGEMENT ROBUSTNESS		F6698
SERVICE	:	
DATA MANAGER ROBUSTNESS		F7253

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	MAINTENANCE AND TESTING
Feature	CCS7 ST COMMISSIONING LOAD
Feature no	F3997

FEATURE SYNOPSIS

This feature provides a load for testing the hardware of the CCS7 signalling terminal (ST).

FEATURE DESCRIPTION

This feature is responsible for providing a signalling terminal firmware load for the commissioning of the new CCS7 ST card (NT6X66). The deliverables of this feature will be as follows:

- An EPROM for the data link processor (DLP) firmware
- An EPROM for the master processor (MP) firmware
- A load for the MP software.

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	MAINTENANCE AND TESTING
Feature	CCS7 - MSB COMMISSIONING LOAD
Feature no	F3998

FEATURE SYNOPSIS

To provide CCS7 MSB load for commissioning hardware.

FEATURE DESCRIPTION

This feature provides a commissioning load for the new XPM peripheral MSB7, used in the CCS7 project.

The following functions are provided by this feature:

- communication with CC via network link
- communication with CCS7 ST
- diagnostics for new components in MSB7
- maintenance facilities to allow CC control of the MSB.

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SIGNALING AND SUPERVISION
Feature	CCS7 - SIGNALING TERMINAL
Feature no	F5510

FEATURE SYNOPSIS

This feature provides signalling terminal (ST) features and its maintenance. The ST handles the layer 2 protocol functions in the CCS7 product.

FEATURE DESCRIPTION

This feature provides the following signalling terminal features in the CCS7 product:

1. CCS7 MSB ST Interface Handling:

This feature handles the communication between MSB MP and all STs.

2. CCS7 MSB ST/STAI Audits:

It provides an audit facility in the MSB7 to check the integrity of ST and STAI (signalling terminal access interface).

3. CCS7 - ST Firmware:

This feature provides basic ST features such as link synchronization.

4. CCS7 ST MP PRO/Congestion Control & Flow Control:

This ST feature provides the processor outage procedures which handles both local processor failures (CC or MSB) and remote processor failure. It also provides a set of procedures to handle congestion control at level 2.

5. CCS7 ST MP Buffer Retrieval:

The purpose of this feature is to allow the MSB7 (message switch and buffer 7) to retrieve CCS7 MSUs (message signalling units) from internal ST7 buffers. The MSUs retrieved would be those that have not yet been sent to, or acknowledged by, the remote end.

6. CCS7 ST DLP Transmit Handler:

This feature transmits #7 SU (signalling units) and keeps the link in sync.

Ref:

FDOCs:

BF0526
BF0529
BF0650
BF0454
BF0457
BF0450

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	CCS7 LINK SET MGMT
Feature no	F5667

FEATURE SYNOPSIS

This feature, CCS7 Linkset Management, represents the DMS implementation of Signalling Link Management (SLM) as specified by ANSI and CCITT Q.704.

FEATURE DESCRIPTION

The purpose of Linkset Management (LSM) is to maintain a certain number of synchronized links for a given linkset, and to restore signalling service in the event of link failure or other disruption in the signalling links or at signalling points.

Linkset Management provides functions to activate and deactivate individual signalling links. A link is activated in order to bring the link in service, and is deactivated in order to take the link out of service.

This feature provides the following functions:

- 1) Table definitions, table control targets, and table initialization in the CC.
- 2) Detailed design of the implementation of ccs7 level 3 functions to manage link sets and links.
- 3) Provides the link management process and finite state machine in the MSB7.
- 4) Provides the Man-Machine interface for linksets. includes MAP display and alarms.
- 5) Integrate special MSB7 channel allocation into general XPM channel allocation.

Ref:

FDOCs:

BC1813
BV2000
BC1807
BC1811
BF1025

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	CCS7 ROUTE SET MGMT
Feature no	F5668

FEATURE SYNOPSIS

This feature, CCS7 Route Set Management (RSM), represents the DMS implementation of Routeset Management as specified by ANSI and CCITT Q.704. CCS7 Routeset Management is responsible for moving signalling messages over the CCS7 signalling network, and it is responsible for the maintenance of the network.

Detail design of CCS7 MTP Route Set Management including the functions Signalling Message Handling, Signalling Traffic Mgmt, and Signalling Route Mgmt. Includes definition of base MTP for all CCITT #7 based signalling systems.

FEATURE DESCRIPTION

The Route Set Management feature provides the following functions:

- 1) Rerouting of CCS7 signalling traffic from a failed link (changeover) and to an RTS'd link (changeback) in the Message Switch & Buffer 7 (MSB7) peripheral environment.
- 2) Maintains integrity of CCS7 Linkset Management (LSM) and Routeset Management (RSM) and performs automatic procedures to correct and recover from failure.
- 3) Implements the table control required for defining and maintaining the concept of routesets within the DMS-100 implementation of the Common Channel Signalling 7 (CCS7), and for defining networks and their attributes within the CCS7 definition.
- 4) Provides primitive control in the CC of the routing resources available to the Router function.
- 5) Provides the function that routes S7 user messages into the signalling network.
- 6) Provides the function that receives S7 messages from the ST and distributes the messages to the S7 users.
- 7) Provides the MAP level interface to the S7 routeset resource. Allows craftsman to control routeset service.

Ref:

FDOCs:

BF0941
BF0942
BC1804
BV2001
BC1798
BC1799
BC1800
BC1803

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	SCCP
Feature no	F5771

FEATURE SYNOPSIS

This feature implements the signalling connection control part (SCCP) for a service switching point (SSP). In addition to basic circuit switched call control signalling, CCS7 provides support for advanced features including transaction capabilities such as database access for enhanced 800 series (E800). SCCP enhances the transport capabilities of the message transfer part (MTP) to provide the special capabilities required to support such services, and therefore users such as transaction capabilities application part/application (e.g., TCAP/E800) and ISDN User Part (ISDNUP).

FEATURE DESCRIPTION

A SCCP user is known as a subsystem (i.e., TCAP/E800, ISDNUP, etc). Associated with each subsystem within a CCS7 network is a unique subsystem number (SSN).

The two addressable entities in the CCS7 network are the point code (PC) and the subsystem. A PC is a node in the CCS7 network attainable via the signalling links of the network. A subsystem, resident at a PC, is a SCCP user or application which utilizes the network services provided by the SCCP and MTP.

The function of the MTP is to route messages through the network based on the point code (PC) and to manage the information on availability of these PCs. The function of the SCCP is to route messages through the network and within a node, based on SSN and to manage the information on availability of these SSNs.

The SCCP is divided into four functional units:

- SCCP Routing Control (SCRC)
- SCCP Connectionless Control (SCLC)
- SCCP Connection-Oriented Control (SCOC)
- SCCP Management (SCMG)

Connection-oriented control procedures are currently being defined by the standards organizations, and is not implemented in this feature.

SCCP implementation is based on Recommendation Q.711-Q.714 of the ANSI/ECSA T1X1.1 specifications.

Ref: FDOC BF0658

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	MTP - CONGESTION/TIMER OPTION TABLE CONTROL
Feature no	F5786

FEATURE SYNOPSIS

This feature provides the second phase of the CCS7 Message Transfer Part (MTP) on the DMS. In BCS-20, a limited subset of the MTP provided Associated Signaling plus the linkset management procedures needed for initial applications in the field. Following is the list of features provided in this implementation:

- 1) MTP - Quasi Associated Signaling
- 2) MTP - Congestion Handling
- 3) MTP - ST Pools for CCS7 Signaling Links
- 4) MTP - Point Code Routing Algorithm

FEATURE DESCRIPTION

- 1) MTP - Quasi Associated Signaling

This feature provides Quasi Associated Signaling capability to MTP for CCS7. It handles all the tasks associated with route availability by implementing the Quasi Associated software of Routeset Management.

- 2) MTP - Congestion Handling

This feature detects local CCS7 link congestion, and remote route congestion, and effects control to alleviate the congestion.

- 3) MTP - ST Pools for CCS7 Signaling Links

This feature provides the capability for dynamic allocation of Signaling Terminal (ST) resources to CCS7 signaling links from a "pool" of STs, at link activation time rather than a static allocation at datafill time.

- 4) MTP - Point Code Routing Algorithm

This feature enables route set selection for the purpose of routing CCS7 messages based on variable length (partial or full) destination point code in signaling networks based on ANSI specifications.

Message routing capability based on partial point code is required by application parts such as Transaction Capabilities ApplicationPart (TCAP) and Signaling Connection Control Part (SCCP).

Ref: FDOC AL0076, BC2291, BC2292, BC2293, BF1024

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	CCS7 BASE
Feature no	F5791

FEATURE SYNOPSIS

The purpose of this feature is to supply common utilities and data structures for the CCS7 product.

FEATURE DESCRIPTION

This feature provides utilities, channels and data structures common to all entities of CCS7, the MTP, ISDN, SCCP, TCAP and other users of CCS7.

The CCS7 base responsibilities can be summarized into the following categories:

1. Network Table:

A datafillable data structure exists in the C7 base to identify the C7 networks existing in the switch.

2. CCS7 MAP Level:

The CCS7 base subsystem contains maintenance and administration functions which are found to be common to more than one CCS user, and not specialized to one user such as the MTP. The functions usually include MMI, logs and table control.

3. Data Types:

Data types that would be used by all the user parts of CCS7 are placed in the CCS7 base.

4. Channels:

The underlying operating system interface to be used in this product is the transaction processing system (TPS) which provides all the channels. There are no contributions required at the CCS7 base level.

5. Logs:

The base establishes a logs system for use by the MTP and potentially special CCS users like SCCP and TCAP. It also defines one log report, the all purpose 'invalid message' log.

Ref:

FDOC BC1814

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICES
Feature	MTP ROBUSTNESS IMPROVEMENT
Feature no	F5792

FEATURE SYNOPSIS

This feature provides loadsharing of CCS7 traffic between links not belonging to the same linkset but within the same combined linkset.

FEATURE DESCRIPTION

Currently, linksets in a combined linkset loadshare traffic across its links independent of the mate linkset's links. As links fail the traffic of the failed link is distributed across the remaining working links within that linkset. Only the failure of the last link in a linkset will cause traffic formerly on the failed link to be diverted to another linkset within that routeset. In the case of combined linksets this would be the mate linkset. As links fail within a linkset there is a likelihood of congesting the remaining working links even though there may be alternative links available in the mate linkset to carry the excess capacity.

This feature provides loadsharing across linkset boundaries within a combined linkset. This means that the links of both linksets in a combined linkset will share the total traffic of the individual linksets.

Ref: DDOC BF0989

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	SCCP-AUDITS AND ENHANCEMENTS
Feature no	F6212

FEATURE SYNOPSIS

This feature provides audit for the SCCP tables. Enhance the speed and efficiency of SCCP in general.

FEATURE DESCRIPTION

This feature provides SCCP audit procedures. Also, data store requirements will be optimized by using dynamic store allocation for table C7NETSSN.

The SCCP audit will monitor the SCCP tables and report any inconsistencies detected using logs. The error will be corrected whenever possible. Certain situations may require manual intervention to correct.

The data store for table C7NETSSN will be allocated dynamically only as required. This will reduce the data store requirements by approximately 100 kbytes for an office with fewer than eight SCCP destination point code.

Ref: DDOC AC0107

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	MAINTENANCE AND TSTING
Feature	CCS7 BCS INSERTION
Feature no	F6214

FEATURE SYNOPSIS

This feature provides the capability to upgrade a BCS containing Common Channel Signalling No. 7 (CCS7) such that CCS7 services are available when call processing is resumed after the SWACT in the Central Control (CC) to the new BCS.

FEATURE DESCRIPTION

The broad objective of this feature is to have CCS7 services such as the Message Transfer Part (MTP), Signalling Connection Control Part (SCCP), and ISDN User Part (ISUP), be available when call processing is resumed on the BCSn+ side. This objective can be broken down into several distinct objectives.

1. The CCS7 MTP should be able to carry signalling traffic when call processing is resumed on the BCSn+ side after the CC SWACT.
2. The Inter PM Links (IPMLs) which are two nailed up network connections between the MSB7 and a DTC, should be kept in service across the BCS Insertion SWACT.
3. ISUP calls in a talking state are preserved.
4. SCCP service should be available for routing after the resumption of call processing on the BCSn+ side. This objective relies on objective 1. above to be satisfied.

Ref: DDOC BC2289

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	MTP - CONGESTION/TIMER
Feature no	F6241

FEATURE SYNOPSIS

This feature provides table control for congestion and timer values for CCS7 message transfer part.

FEATURE DESCRIPTION

This feature implements the table control required for defining and maintaining the timer and congestion threshold values used within the DMS-100 implementation of the CCS7.

Ref: DDOC BC2290

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	MAINTENANCE AND TSTING
Feature	MTP - DISTRIBUTED DATA MGMT
Feature no	F6267

FEATURE SYNOPSIS

This feature provides the generic mechanism for distributing CCS7 data to multiple nodes. this feature includes maintenance of Node/PM status & means for updating distributed static & dynamic data.

FEATURE DESCRIPTION

The distributed data manager provides a mechanism to update many common nodes in the DMS switch with the same information. The CC/CM is the source of the data.

The data manager will distribute any single data update to a collection of nodes pre-specified by the application, and will verify the distribution, if requested by the application to do so.

The data manager is responsible for downloading all the application's data on RTS of any node used by the application.

The data manager will audit every node over CC/CM restarts, and will engineer data downloading to nodes out of sync with the CC/CM

Although the data manager is being developed for the needs of the CCS7 STP/multi-MSB project, it is not CCS7 specific; it can be used by any application with distributed data needs.

Ref: AC0148

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	MTP - DISTRIBUTED LINK/ROUTE STATUS CHANGES
Feature no	F6268

FEATURE SYNOPSIS

To provide changes required to support link changeover and changeback and rerouting procedures in a distributed CCS7 architecture. This evolution is in anticipation of the multi-MSB solution and the STP products.

FEATURE DESCRIPTION

In order to gain messaging capacity with existing hardware a multi-MSB solution is used. In the current design, more than one MSB can be used but CCS #7 table control precludes the distribution of links in a linkset or routesup 8a routeset across more than one MSB. Therefore, in the single MSB solution, CCS7 traffic is deterministically directed to an MSB. In the proposed multi-MSB solution each DMS node from which CCS #7 messages can originate must still direct outgoing CCS #7 messages to a single MSB but the selection of this MSB must dynamically react to changes in the availability of link and route resources.

This feature puts into place software which provides the basis for these nodes to maintain their own link and route status information based on information provided to them from Routeset Management in the CC for the purpose of routing to the correct MSB.

No new functionality is introduced in this feature. In BCS23, CCS #7 table control has not changed, still restricting the distribution of routesets and linksets over more than one MSB.

Ref: AC0149

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SCCP - SCP ACCESS
Feature	SCCP - FOR DMS SCP
Feature no	F6301

FEATURE SYNOPSIS

This feature provides the Signalling Connection Control Part (SCCP) layer of CCS7 protocol, for the DMS-SCP (Service Control Point).

FEATURE DESCRIPTION

This feature incorporates the following items:

- SCCP Management (SCMG) functionality to provide coordinated state change control (CSCC) and remote broadcast required for SCP operation.
- SCCP management for multiple instances of local subsystems.
- Changes to the local subsystem MAP level to reflect the new subsystem configuration within the DMS.
- The addition of a local subsystem table.
- The migration of the SCCP local routing functions from the CC to the MSB7.
- Changes to the SCCP local routing algorithm.

REF: DDOC AC0143

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	ROBUSTNESS
Feature	MTP - ROBUSTNESS IMPROVEMENTS
Feature no	F6697

FEATURE SYNOPSIS

This feature provides several improvements in the Message Transfer Part (MTP).

FEATURE DESCRIPTION

The areas of improvement are:

C7LKSET Table Control

The ACTLINKS field is removed from the C7LKSET table. Links can be added or deleted from a linkset without having to offline the linkset.

The range for the non-aligned time (Q703T2) has been increased

MTP-User Part Interface

The MTP-User Part interface is improved to decrease the amount of processor time consumed to handle a single event affecting a very large number of routesets.

Office Parameter CCS7_H0H1_RCP

An office parameter CCS7_H0H1_RCP is added to table OFCOPT to allow the change of the H0H1 code for Routeset Cluster Prohibited messages.

Ref: FDOC AC0411

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	ROBUSTNESS
Feature	SCCP MANAGEMENT ROBUSTNESS
Feature no	F6698

Synopsis

The Signaling Connection Control Part (SCCP) Management Robustness feature allows the SCCP Management subsystem to handle Point Code and System status changes more efficiently.

This feature reduces the amount of real time used by the SCCP Management subsystem.

Implementation

No operating company action is required to implement this feature.

The log information generated on a status change of a number of routesets is condensed. The system generates one log indicating the point codes that changed state and the number of subsystems at each point code that changed state.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX270AA New Peripheral Maintenance

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

There are no restrictions on the use of this feature.

Reference

FDOC AC0431

Package	NTX041AB04 CCS7 - MTP/SCCP(UPG.OF NTX041AA)
Feature set	SERVICE
Feature	DATA MANAGER ROBUSTNESS
Feature no	F7253

Synopsis

The Data Manager Robustness feature improves the data manager audit mechanism by reducing the amount of messaging between the Central Control or Compute Module and the Peripheral Modules. It also provides a more efficient method of ensuring consistent data across the system.

Implementation

No operating company action is required to implement this feature.

This feature generates two new logs, DDM106 and DDM107. The DDM106 log is generated whenever an audit of distributed data fails; it specifies in what peripheral module node the audit failed and the reason for the failure. The DDM107 log is generated whenever an attempt to retrieve OM data fails; it specifies the table for which OM data retrieval failed and the reason for the failure.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX270AA New Peripheral Maintenance

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing features.

Restrictions

There are no restrictions on the use of this feature.

Reference

FDOC AC0443

NTX042AA04 Status: RTM LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)

NUMBER IDENTIFICATION/CHARGING :		
REMOTE ONI	TO SP-1 TOPS	F0564
REMOTE ONI	TO WE TSPS	F0565
AMA	SINGLE ENTRY FORMAT	F0568
END OF TAPE ALARM		F0570
MAGNETIC TAPE LOCAL INHIBIT		F0572
OPTION TO RECORD UNCOMPLETED CALLS		F0579
TOTAL CALLS SUMMARY ON AMA RECORD		F0586
LAMA SUPERVISION	ANSWER TIMING	F0745
LAMA SUPERVISION	CALLED DISCONNECT TIMING	F0746
AUTOMATIC ROTATION OF STORAGE DEVICE		F1114
ONI SERVICES		F1193
BCD RECORDING		F1198
ADMINISTRATION :		
AMA FAILURE ROUTING OPTIONS		F2475
NUMBER IDENTIFICATION/CHARGING :		
FLEXIBLE LONG DURATION CALL REPORTING		F2591

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	REMOTE ONI	TO SP-1	TOPS
Feature no	F0564		

DESCRIPTION

For operator number identification the call can be extended to an operator at a remote TOPS or TSPS system. The remote operator keys the calling number which is received at the DMS via an MF trunk.

After receipt of the calling number the connection to the remote operator is released and switching, routing and billing of the call takes place in the DMS.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	REMOTE ONI	TO WE TSPS	
Feature no	F0565		

SEE FEATURE NUMBER F0564

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	AMA	SINGLE ENTRY FORMAT	
Feature no	F0568		

DESCRIPTION

The feature will provide the capability of recording DDD calls on a class 4 toll office. The recording of the DDD call will take place at the terminations of the call in the form of single entry format including the following call related information.

- a) Calling number (10 digits)
- b) Called number (10/16 digits)
- c) Answer time (day, hour, min, sec)
- d) Conversation time (sec)
- e) Call type identification
- f) Calling/Called party service feature identification
- g) Other system and change of status in the CAMA related hardware which may affect the downstream processing of the data.

Option is provided to record either answered calls only or both completed and non-completed calls.

The call data is recorded on magnetic tape with standard single volume IBM tape system labels. The call data itself can be recorded in either BDC or EBCDIC character format. Fixed block length of 2048 bytes is used in the recording. Sequency count of each block and total number of block recorded on each tape is recorded to ensure the integrity of data and to facilitate downstream processing.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	END OF TAPE ALARM
Feature no	F0570

DESCRIPTION

When the DMS detects the end of tape mark, on any system tapes, a major external alarm signal is sounded to alert the craftsman to demount the recorded tape and replace it. In the case of AMA tape, the detection of end of tape mark will result in an automatic transfer from the active to standby unit. If the transfer is not possible or there is no other assigned AMA standby after the transfer, a critical alarm will be initiated by the system.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	MAGNETIC TAPE LOCAL INHIBIT
Feature no	F0572

DESCRIPTION

An 'INHIBIT' command is provided at the MAP to control the local inhibit feature of the tape drives. When enabled, this feature prevents tampering with the tape drive via the front panel switches on the drives. Local inhibit must be reinstated manually after restarts or returns to service.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	OPTION TO RECORD UNCOMPLETED CALLS
Feature no	F0579

DESCRIPTION

DMS provides the option to record uncompleted DDD calls on AMA tape. Standard AMA data format, which includes calling and called number, will be used with the elapsed conversation time set to zero.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	TOTAL CALLS SUMMARY ON AMA RECORD
Feature no	F0586

DESCRIPTION

This feature records AMA tape call counts by call type at the end of the tape when a tape transfer is executed. The call counts are appended to the present outgoing transfer entry 'FB'.

The AMA Call Count Extension to Entry 'FB'

All counts are in binary and are effectively 32 bits (a 16 bit primary counter plus a 16 bit overflow counter). The counts are based on tape entries. Calls which do not generate tape entries do not generate a count. For example, if unanswered calls are not being recorded, they will not be included in the counts.

Since the first 6 bytes of the entry remains unchanged, the new format is upward compatible with existing downstream processes (unless they make use of the fact that the rest of the block is initialized to X 'AA' - unlikely).

The definition of the various counters is as follows:

NANI - Successful ANI calls. Does not include calls with ONI class ID digit.

NANI2 - Overflow count for NANI.

NONI - Number of ONI calls. Includes ANI calls with ONI class ID digit.

NONI2 - Overflow count for NONI.

NANIF - Number of ANI calls which are determined by originating office identification failure.

NANIF2 - Overflow count for NANIF.

ANOF - Number of ANI calls with ANI fail ID digit. Originating office identification failure.

ANCF2 - Overflow count for ANOF.

NLNI - Successful line identification for LAMA call.

NLNI2 - Overflow count for NLNI.

NLCI - ONI line class calls.

NLCI2 - Overflow count for NLCI.

NLIF - Line identification failures.

NLIF2 - Overflow count for NLIF.

The entries on tape is equal to the sum of the counts (overflow counts are times 2^{33} 16).

DMS-100 offices will have zero NANI, NANI2, NAIF, NANIF2, NONI, NONI2, counts. DMS-200 offices will have zero NLNI, NLNI2, NLCI, NLCI2, NLIF, NLIF2, counts. All counts are applicable to DMS-100/200 offices.

Byte
Position

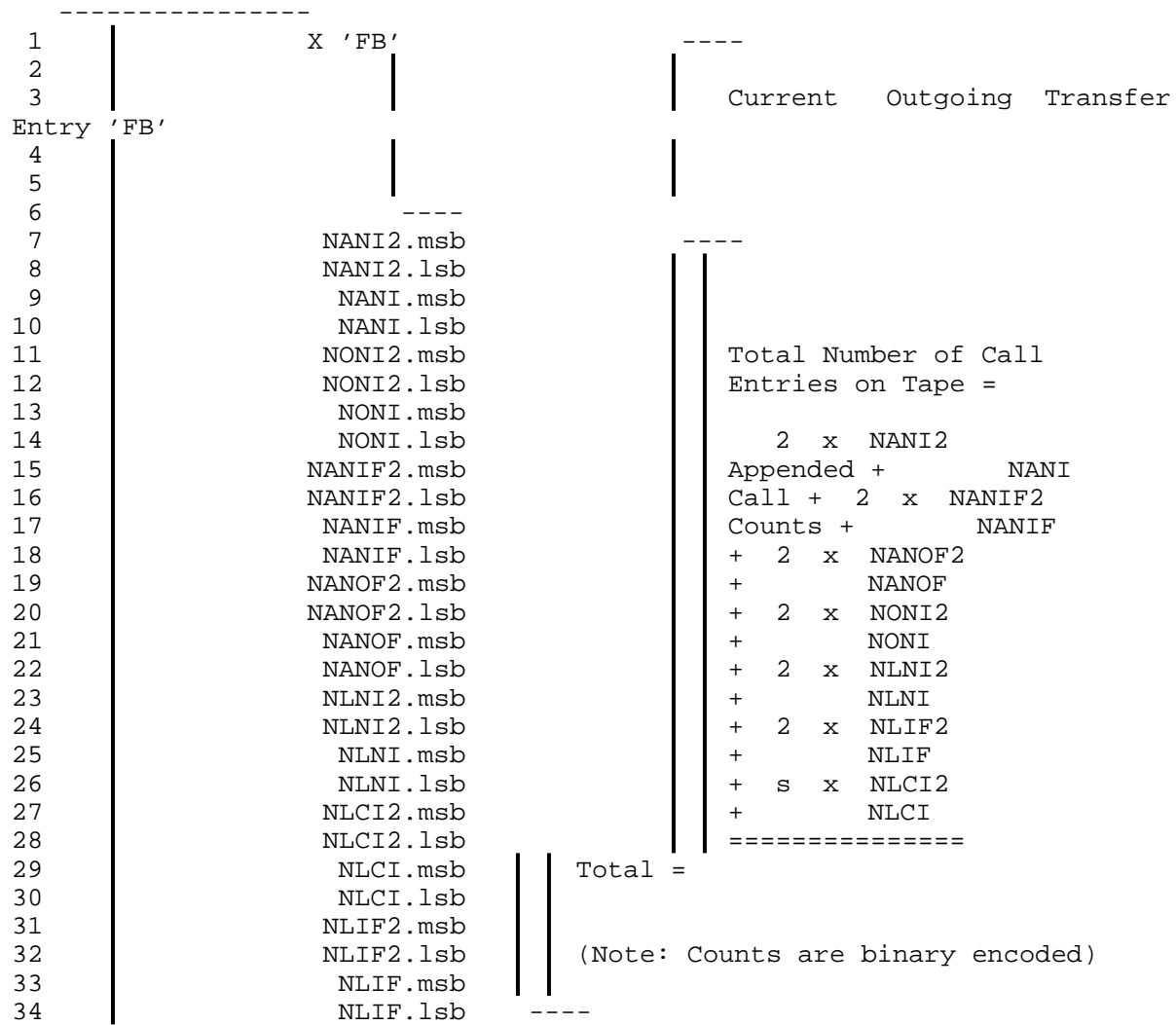


Fig. 1 APPENDED OUTGOING TRANSFER ENTRY 'FB'

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	LAMA SUPERVISION	ANSWER TIMING	
Feature no	F0745		

DESCRIPTION

The recognition timing for answer and called party disconnect supervision timing on the appropriate trunk can be set on an office basis. These parameters will be set to the required value during load building and can be modified by operating company if necessary.

Answer Timing

This parameter specifies the timeout before a call recorded on LAMA is combined answerable and changeable. The value can be set in units of 10 milliseconds with a default of 1 second.

Called Party Disconnect Timing

This parameter specifies the called party must be on-hook before a call recorded via LAMA is considered disconnected. The value can be set in units of 10 milliseconds with a default of 5 seconds.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	LAMA SUPERVISION	CALLED DISCONNECT TI	
Feature no	F0746		

SEE FEATURE NUMBER F0745

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	AUTOMATIC ROTATION OF STORAGE DEVICE
Feature no	F1114

DESCRIPTION

The Automatic Message Accounting (AMA) facility in DMS consists of up to five tape drives each with dedicated control circuitry. For normal everyday operations, two tape drives are used, one assigned as ACTIVE and the other as STANDBY1. For a three-tape drive system, a third tape drive can be assigned as STANDBY2 by telco personnel. This tape drive can be either a dedicated AMA drive, or a spare tape drive. This feature would normally be used during extended periods of unmanned operation of the office to reduce the chance of losing call data as a result of malfunctioning of the recording facilities.

A transfer to the standby tape unit can take place for the following reasons:

- (a) requested by maintenance personnel;
- (b) scheduled automatic transfer;
- (c) tape on active drive is full, end-of-tape (EOT) marker;
- (d) failure of the active drive;
- (e) broken tape.

Either of the last two occurrences constitute a tape unit failure, while the last three occurrences generate an output report and an alarm.

Transfer entries are made each time a transfer occurs. The entries are made into the buffer and are as follows.

Non Emergency Transfers:

- an outgoing transfer entry is made into the buffer prior to the buffer being written into the still-ACTIVE tape just before transfer.
- an incoming transfer entry is made as the first entry of the next buffer load. When the buffer is full it will be written onto the newly-ACTIVE tape.

Emergency Transfers:

- When an emergency transfer occurs the full buffer is first written onto the newly-ACTIVE tape while the incoming emergency transfer entry information is entered at the beginning of the next buffer load.

Note: With multiple transfer requests a tape could become ACTIVE several times, this results with incoming and outgoing entries being made for each request.

An AMA system is composed of at least one active unit and one standby unit. If desired, maintenance personnel may assign two units as standby, in which case one unit is called STANDBY1 and the other STANDBY2. Two additional tape states are DEMOUNT(1,2) and MOUNT(1,2).

A tape unit enters DEMOUNT(1,2) state only as a result of either an emergency transfer or an EOT transfer and is unavailable for further use. Tape units to be used by the AMA system are first entered into the MOUNT(1,2) state by maintenance personnel, then assigned as STANDBY (1 or 2) by command from a MAP.

When an AMA transfer is initiated, the drives change state as follows.

Two Tape Units Available

The STANDBY1 unit becomes ACTIVE and the ACTIVE unit becomes STANDBY1. The two units alternate status in this manner for each transfer request.

Three Tape Units Available

The STANDBY1 unit becomes ACTIVE, the ACTIVE unit becomes STANDBY2 and STANDBY2 becomes STANDBY1. The units change status in a similar fashion on a rotational basis for consecutive transfer requests.

If an automatic (scheduled) transfer occurs, and the second tape unit later fails, the emergency procedure causes a transfer to the STANDBY unit (which becomes ACTIVE). The defective unit is put into DEMOUNT(1,2) state where it is not available to the AMA system until the problem has been manually cleared. If three units are available, a second emergency transfer to the third unit (now STANDBY1) can occur. Such emergency transfer, where a STANDBY unit is still available, causes a trouble message to be issued to the designated MAP or other I/O terminal, and a minor alarm to be generated.

If an EOT condition occurs on the active unit, the unit is put into DEMOUNT(1,2) state, an EOT alarm is generated and the STANDBY unit becomes ACTIVE.

NOTE: This condition differs from emergency transfer to DEMOUNT(1,2) state in that all the necessary outgoing transfer entries are made, the file is closed and trailer labels are written on the tape.

If a non-emergency transfer is attempted when a STANDBY unit does not exist, no transfer occurs, and a major trouble message and alarm is issued. If the ACTIVE unit fails, and a subsequent transfer to the STANDBY1 unit also fails (where no STANDBY2 exists), no transfer back to the ACTIVE unit occurs, and a critical output report and alarm are generated. If a

STANDBY2 unit exists, a second emergency transfer attempt is made. If the second attempt to STANDBY2 fails, there is again no transfer back to ACTIVE, and the critical alarm is generated.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
Feature set	ADMINISTRATION
Feature	AMA FAILURE ROUTING OPTIONS
Feature no	F2475

FUNCTIONAL DESCRIPTION

1. BACKGROUND

The objective of AMA system is to record billing details of all chargeable calls onto a device (tape or disk).

During the call, most of the call-processing agencies store information about the call in the CCB. When the call ends (disconnects) the agency will get a recording-unit extension block, and copy the billing information to it. Then the recording-unit extension block is detached from the CCB and put on the EXT queue.

The AMA process periodically checks the EXT queue. If the EXT queue is not empty, then the data in the EXT queue is formatted into a specified layout (NT, ATT or SMDR format) and stored in a 2048-byte buffer. When this buffer is full it is written to the AMA device (tape or disk).

During the above process of recording charge information, the following cases might happen which will result in charge free calls. This feature provides routing options which can be used to charge toll calls during AMA problems/failure.

- 1) No AMA devices (or files) are available.
- 2) No recording-unit extension block is available.
- 3) An AMA process traps due to software bugs. At present, after fixing the problem a warm restart is required to recover the AMA system.

2. FEATURE DESCRIPTION

2.1 Type of Office

This feature will apply to DMS-100, DMS-100/200, DMS-200 switches only.

2.2 The Proposed Routing Options

The following illustrates the proposed different routing options under AMA failure for different DMS office configurations.

i) DMS-100 (LAMA) office or DMS-100/200 (LAMA/CAMA) combined office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

ii) DMS 200 (CAMA) office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

iii) DMS TOPS office

The present TOPS handles CAMA failure cases as follows:

a) due to no CAMA TOPS recording units:

The way TOPS handles CAMA call is to get a CAMA TOPS recording unit before collecting calling numbers. If the recording unit is not available, the call is blocked and routed to a treatment.

b) due to no devices(files) or process dead:

The call will be routed free of charge.

In case of condition (a), the calls will now be pegged under the AMAROUTE om register.

In case of condition (b), the calls will now be pegged under the AMAFREE om register.

No other changes will be made in the TOPS call handling because of the existing TOPS call processing design.

AMA restart process command will apply to the TOPS AMA process (see MM section for AMARESTART command).

3. ALARMS AND LOGS

If AMA failure is detected, both DIRP and OFFICE ALARM subsystem will generate alarms with log reports.

3.1 MAP Alarm Indications

The alarm indications will be displayed under IOD and EXT at the MAP MTC subsystem for the following failure cases (as defined in section 1) :

	IOD	EXT
a. no active file available:	NO AMA 3C3	1 CRIT 3C3
b. no recording unit:	AMA B 3C3	1 CRIT 3C3
c. process dead:	AMA B 3C3	1 CRIT 3C3

If there were more than one failed cases happened, the EXT and IOD MAP alarms will be cleared only if all the failed cases are recovered. Telco should check the DIRP logs for failed reasons.

3.2 Logs

There will be two logs: DIRP101 and EXT108 generated for AMA failure. Each failed case is indicated in DIRP101 log with stream name in SSNAME and failed reason in TEXT.

Only one EXT108 log showing AMAFAIL ON is available even though there might be more than one failed cases and only one EXT108 log showing AMAFAIL OFF is available when all the failed cases have been recovered.

Package	NTX042AA04 LOCAL AUTOMATIC MESSAGE ACCOUNTING (LAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	FLEXIBLE LONG DURATION CALL REPORTING
Feature no	F2591

FEATURE SYNOPSIS

This feature gives the Telcos the ability to set the long-duration audit interval. Previously this interval was fixed to 24 hours.

This feature only affects the ama long-durations audits for NT AMA-Format offices. See FN section for more details.

FEATURE DESCRIPTION

This feature will provide capability for Lama and Cama (NT format only) to check for long-duration calls as per the time selected by the Telco. At present the only long-duration calls that are greater than 24 hours are checked. This will allow the Telco the ability to check calls that are greater than some specified hour that is specified by the Telco.

This feature is applicable for offices with NT AMA-Format. AT&T AMA-Format offices will not be affected by this feature.

Capability will be provided via OFCPARMS (OFCENG table) to allow the Telcos to change this long-duration as required. The default long-duration will be the same as is used at present (i.e. 24 hours). The values for AMA_LONG_DUR_AUDIT_INTERVAL can be in the range of (1 to 24) hours.

The NT-AMA-Format long-duration cal logs (AMA112) are only produced for AMA calls on SCama Trunks and LAMA calls from lines. LCDR, SMDR, and AMA cal on TOPS Trunks are not included in the Long- Duration call audits.

LOG REPORTS AFFECTED - AMA112

DB TABLES AFFECTED - OFCENG

REFERENCES

FDOC BR0591 for log and data schema changes.

NTX043AA03 Status: RTM LOCAL CALL DETAIL RECORDING

NUMBER IDENTIFICATION/CHARGING :	
LOCAL CALL DETAIL RECORDING	F0573
STATION OPTIONS COMPATIBILITY :	
COMPATIBILITY OF LCDR OPTION ON CDF AND CCF COIN LINES	F2758

Package	NTX043AA03 LOCAL CALL DETAIL RECORDING
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	LOCAL CALL DETAIL RECORDING
Feature no	F0573

DESCRIPTION

Detailed call reording is a feature which facilitates charging of local calls. Lines assigned to this service may be billed an amount proportional to the conversation time for all local calls. Toll calls are handled in the normal way via the AMA system. The main points of the feature are:

- 1) The feature serves as LAMA extension in Class 5 operation.
- 2) The service is available on an individual line basis.
- 3) The service co-exists with flat rate, message rate, etc.
- 4) Local and toll calls are recorded on the same tape.

Package	NTX043AA03 LOCAL CALL DETAIL RECORDING
Feature set	STATION OPTIONS COMPATIBILITY
Feature	COMPATIBILITY OF LCDR OPTION ON CDF AND CCF COIN L
Feature no	F2758

FEATURE SYNOPSIS

This feature makes Local Call Detail Recording(LCDR) line option compatible with Coin Coin First (CCF) and Coin Dial First(CDF) lines.

FEATURE DESCRIPTION

The LCDR line option is a non-resident feature of a Local Automatic Message Accounting(LAMA)-equipped switch that permits the recording of details relating to non direct distance dialing(DDD) type customer dialed calls. This data may be used by the operating company for call analysis or billing. Presently the LCDR line option is not compatible with CCF and CDF lines.

This feature provides the capability to make the LCDR line option compatible with CCF and CDF coin lines. The Automatic Message Accounting(AMA) records are generated on local and EAS calls from the coin stations with LCDR option. This feature allows the service order(SERVORD)facility to accept the LCDR option added to the CCF and CDF lines.

REFERENCES:

FDOC BR0758 Compatibility of LCDR option on CDF and CCF coin line

NTX044AA04 Status: RTM CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CA

ADMINISTRATION	:	
BLUE BOX FRAUD PREVENTIONN		F0184
NUMBER IDENTIFICATION/CHARGING :		
ONI SWITCHING ON ANI FAIL		F0230
ADMINISTRATION	:	
ROUTE TRANSFER RONI/CAMA POSITIONS		F0314
NUMBER IDENTIFICATION/CHARGING :		
REMOTE ONI	TO SP-1 TOPS	F0564
REMOTE ONI	TO WE TSPS	F0565
AMA	SINGLE ENTRY FORMAT	F0568
END OF TAPE ALARM		F0570
MAGNETIC TAPE LOCAL INHIBIT		F0572
OPTION TO RECORD UNCOMPLETED	CALLS	F0579
CAMA SUPERVISION	ANSWER TIMING	F0580
CAMA SUPERVISION	CALLED DISCONNECT TIMING	F0581
PRINTOUT ON ANI FAILURE		F0583
RECEIPT OF BELL ANI FORMAT		F0584
TOTAL CALLS SUMMARY ON AMA RECORD		F0586
AUTOMATIC ROTATION OF STORAGE DEVICE		F1114
ONI SERVICES		F1193
BCD RECORDING		F1198
AMA RECORD ON REMOTE/TOLL CALL FORWARDING		F1239
AMA RECORD OF TANDEM SWITCH	SEIZURE - ONLY CALLS	F2199
ADMINISTRATION	:	
AMA FAILURE ROUTING OPTIONS		F2475
NUMBER IDENTIFICATION/CHARGING :		
FLEXIBLE LONG DURATION CALL REPORTING		F2591

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	ADMINISTRATION
Feature	BLUE BOX FRAUD PREVENTIONN
Feature no	F0184

DESCRIPTION

"Blue Box" fraude prevention depends upon an in-band signalling link (SF) being present in an end-to-end call connection. This signalling link is released by the calling party using a blue box before or after the called subscriber answers. The signalling link is then re-seized by the calling party and a new destination directory number outputted (MF) using the blue box. This operation, except for the wink start or delay dial signal, is transparent to the offices preceding the in-band signalling link.

In order to detect this type of fraud, DMS-200 will detect a second proceed to send signal from the incoming SF unit at the distant office, i.e. a signal having a nominal duration of 200 msec. (greater than 75 msec. and less than 2 sec.). Upon detection of the second proceed to send signal, DMS-200 will connect an MF receiver to the incoming CAMA trunk for a period of 30 sec. If digits are not received within this 30 sec. period, the second number is entered on tape, together with an identifying code.

At this point the call may be dropped or allowed to proceed, the operating company having the necessary data to correctly bill the call. There is no danger of the fraudulent call proceeding after time-out of the DMS-200 MF receiver, as the MF receiver at the distant office will time out after 25 sec. If this occurs, the fraudulent call must re-instate his call, in which case the detection is repeated.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ONI SWITCHING ON ANI FAIL
Feature no	F0230

DESCRIPTION

Calls from incoming ONI routes and calls with ANI failure indicator will be switched to CAMA boards. The attachment of MF receiver for the ONI outpulsing, queuing of ONI calls and application of tones from part of the inherent capability of ONI suitability.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	ADMINISTRATION
Feature	ROUTE TRANSFER RONI/CAMA POSITIONS
Feature no	F0314

DESCRIPTION

During regular traffic all ONI traffic is routed to the SP-1 4 wire TOPS for RONI operation. During traffic congestion in the TOPS machine, an input command is issued at the MAP whereby all RONI traffic is diverted from the TOPS machine to CAMA positions.

The current CAMA position software has provided for data identifying position trunks as local or remote. Another flag for switching activity from one type to another is also provided. Both local and remote position trunks will be handled by one group. When the activity flag indicated 'local', a remote CAMA trunk will not be linked into the idle list once it completes a call. Similarly a local operator will seat the headset and the corresponding CAMA position trunk will be linked ready to be selected.

The activity flag will be settable by command.

Notes:

- Only one CAMA suspension/call waiting circuit is assumed.
- Only one call waiting queue and threshold is assumed.
- Only one OM group is provided.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	REMOTE ONI	TO SP-1	TOPS
Feature no	F0564		

DESCRIPTION

For operator number identification the call can be extended to an operator at a remote TOPS or TSPS system. The remote operator keys the calling number which is received at the DMS via an MF trunk.

After receipt of the calling number the connection to the remote operator is released and switching, routing and billing of the call takes place in the DMS.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	REMOTE ONI	TO WE TSPS	
Feature no	F0565		

SEE FEATURE NUMBER F0564

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	AMA SINGLE ENTRY FORMAT
Feature no	F0568

DESCRIPTION

The feature will provide the capability of recording DDD calls on a class 4 toll office. The recording of the DDD call will take place at the terminations of the call in the form of single entry format including the following call related information.

- a) Calling number (10 digits)
- b) Called number (10/16 digits)
- c) Answer time (day, hour, min, sec)
- d) Conversation time (sec)
- e) Call type identification
- f) Calling/Called party service feature identification
- g) Other system and change of status in the CAMA related hardware which may affect the downstream processing of the data.

Option is provided to record either answered calls only or both completed and non-completed calls.

The call data is recorded on magnetic tape with standard single volume IBM tape system labels. The call data itself can be recorded in either BDC or EBCDIC character format. Fixed block length of 2048 bytes is used in the recording. Sequency count of each block and total number of block recorded on each tape is recorded to ensure the integrity of data and to facilitate downstream processing.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	END OF TAPE ALARM
Feature no	F0570

DESCRIPTION

When the DMS detects the end of tape mark, on any system tapes, a major external alarm signal is sounded to alert the craftsman to demount the recorded tape and replace it. In the case of AMA tape, the detection of end of tape mark will result in an automatic transfer from the active to standby unit. If the transfer is not possible or there is no other assigned AMA standby after the transfer, a critical alarm will be initiated by the system.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	MAGNETIC TAPE LOCAL INHIBIT
Feature no	F0572

DESCRIPTION

An 'INHIBIT' command is provided at the MAP to control the local inhibit feature of the tape drives. When enabled, this feature prevents tampering with the tape drive via the front panel switches on the drives. Local inhibit must be reinstated manually after restarts or returns to service.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	OPTION TO RECORD UNCOMPLETED CALLS
Feature no	F0579

DESCRIPTION

DMS provides the option to record uncompleted DDD calls on AMA tape. Standard AMA data format, which includes calling and called number, will be used with the elapsed conversation time set to zero.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	CAMA SUPERVISION	ANSWER TIMING	
Feature no	F0580		

DESCRIPTION

The recognition timing or answer and called party disconnect supervision timing on the appropriate trunk can be set on an office basis.

Answer Timing

This parameter specifies the time when a call billed via CAMA is combined answerable and changeable. The value can be set in units of 10 milliseconds with a default of 1 second.

Called Party Disconnect Timing

This parameter specifies the time and called party must be on-hook before a DDD call is considered disconnected. The value can be set in units of 10 milliseconds with a default of 5 seconds.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	PRINTOUT ON ANI FAILURE
Feature no	F0583

DESCRIPTION

Calls which experience an ANI failure cause a message to be output to the printer. The output message is provided after the CAMA operator has keyed in the calling number and includes:

- source of failure (i.e. ANI fail indication from the end office)
- called and calling numbers
- incoming trunk identity
- incoming trunk group identity

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	RECEIPT OF BELL ANI FORMAT
Feature no	F0584

DESCRIPTION

DMS-200 will request and detect ANI information as per AT&T Notes on Distance Dialing.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	TOTAL CALLS SUMMARY ON AMA RECORD
Feature no	F0586

DESCRIPTION

This feature records AMA tape call counts by call type at the end of the tape when a tape transfer is executed. The call counts are appended to the present outgoing transfer entry 'FB'.

The AMA Call Count Extension to Entry 'FB'

All counts are in binary and are effectively 32 bits (a 16 bit primary counter plus a 16 bit overflow counter). The counts are based on tape entries. Calls which do not generate tape entries do not generate a count. For example, if unanswered calls are not being recorded, they will not be included in the counts.

Since the first 6 bytes of the entry remains unchanged, the new format is upward compatible with existing downstream processes (unless they make use of the fact that the rest of the block is initialized to X 'AA' - unlikely).

The definition of the various counters is as follows:

NANI - Successful ANI calls. Does not include calls with ONI class ID digit.

NANI2 - Overflow count for NANI.

NONI - Number of ONI calls. Includes ANI calls with ONI class ID digit.

NONI2 - Overflow count for NONI.

NANIF - Number of ANI calls which are determined by originating office identification failure.

NANIF2 - Overflow count for NANIF.

ANOF - Number of ANI calls with ANI fail ID digit. Originating office identification failure.

ANCF2 - Overflow count for ANOF.

NLNI - Successful line identification for LAMA call.

NLNI2 - Overflow count for NLNI.

NLCI - ONI line class calls.

NLCI2 - Overflow count for NLCI.

NLIF - Line identification failures.

NLIF2 - Overflow count for NLIF.

The entries on tape is equal to the sum of the counts (overflow counts are times 2^{33} 16).

DMS-100 offices will have zero NANI, NANI2, NAIF, NANIF2, NONI, NONI2, counts. DMS-200 offices will have zero NLNI, NLNI2, NLCI, NLCI2, NLIF, NLIF2, counts. All counts are applicable to DMS-100/200 offices.

Byte
Position

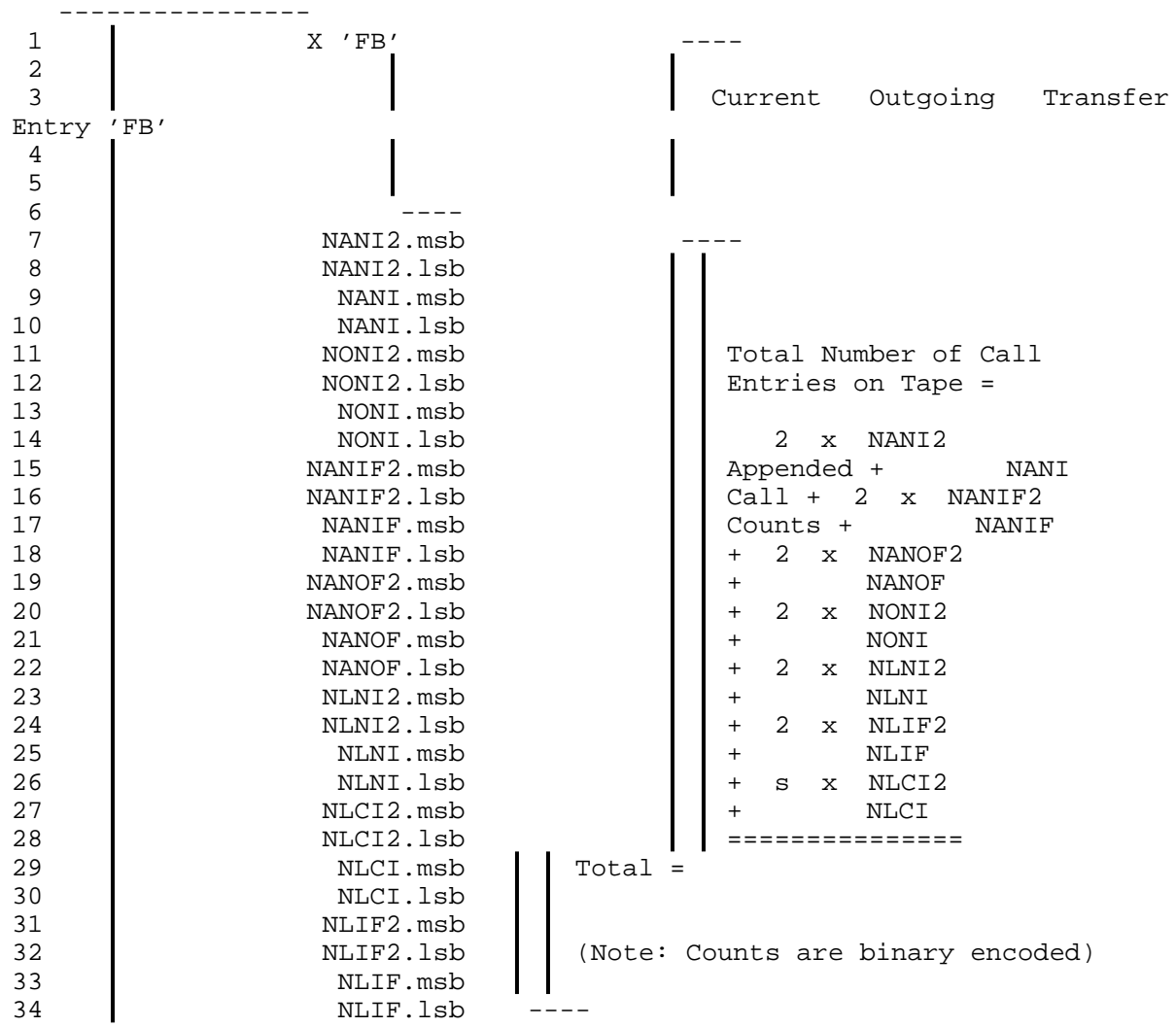


Fig. 1 APPENDED OUTGOING TRANSFER ENTRY 'FB'

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	AUTOMATIC ROTATION OF STORAGE DEVICE
Feature no	F1114

DESCRIPTION

The Automatic Message Accounting (AMA) facility in DMS consists of up to five tape drives each with dedicated control circuitry. For normal everyday operations, two tape drives are used, one assigned as ACTIVE and the other as STANDBY1. For a three-tape drive system, a third tape drive can be assigned as STANDBY2 by telco personnel. This tape drive can be either a dedicated AMA drive, or a spare tape drive. This feature would normally be used during extended periods of unmanned operation of the office to reduce the chance of losing call data as a result of malfunctioning of the recording facilities.

A transfer to the standby tape unit can take place for the following reasons:

- (a) requested by maintenance personnel;
- (b) scheduled automatic transfer;
- (c) tape on active drive is full, end-of-tape (EOT) marker;
- (d) failure of the active drive;
- (e) broken tape.

Either of the last two occurrences constitute a tape unit failure, while the last three occurrences generate an output report and an alarm.

Transfer entries are made each time a transfer occurs. The entries are made into the buffer and are as follows.

Non Emergency Transfers:

- an outgoing transfer entry is made into the buffer prior to the buffer being written into the still-ACTIVE tape just before transfer.
- an incoming transfer entry is made as the first entry of the next buffer load. When the buffer is full it will be written onto the newly-ACTIVE tape.

Emergency Transfers:

- When an emergency transfer occurs the full buffer is first written onto the newly-ACTIVE tape while the incoming emergency transfer entry information is entered at the beginning of the next buffer load.

Note: With multiple transfer requests a tape could become ACTIVE several times, this results with incoming and outgoing entries being made for each request.

An AMA system is composed of at least one active unit and one standby unit. If desired, maintenance personnel may assign two units as standby, in which case one unit is called STANDBY1 and the other STANDBY2. Two additional tape states are DEMOUNT(1,2) and MOUNT(1,2).

A tape unit enters DEMOUNT(1,2) state only as a result of either an emergency transfer or an EOT transfer and is unavailable for further use. Tape units to be used by the AMA system are first entered into the MOUNT(1,2) state by maintenance personnel, then assigned as STANDBY (1 or 2) by command from a MAP.

When an AMA transfer is initiated, the drives change state as follows.

Two Tape Units Available

The STANDBY1 unit becomes ACTIVE and the ACTIVE unit becomes STANDBY1. The two units alternate status in this manner for each transfer request.

Three Tape Units Available

The STANDBY1 unit becomes ACTIVE, the ACTIVE unit becomes STANDBY2 and STANDBY2 becomes STANDBY1. The units change status in a similar fashion on a rotational basis for consecutive transfer requests.

If an automatic (scheduled) transfer occurs, and the second tape unit later fails, the emergency procedure causes a transfer to the STANDBY unit (which becomes ACTIVE). The defective unit is put into DEMOUNT(1,2) state where it is not available to the AMA system until the problem has been manually cleared. If three units are available, a second emergency transfer to the third unit (now STANDBY1) can occur. Such emergency transfer, where a STANDBY unit is still available, causes a trouble message to be issued to the designated MAP or other I/O terminal, and a minor alarm to be generated.

If an EOT condition occurs on the active unit, the unit is put into DEMOUNT(1,2) state, an EOT alarm is generated and the STANDBY unit becomes ACTIVE.

NOTE: This condition differs from emergency transfer to DEMOUNT(1,2) state in that all the necessary outgoing transfer entries are made, the file is closed and trailer labels are written on the tape.

If a non-emergency transfer is attempted when a STANDBY unit does not exist, no transfer occurs, and a major trouble message and alarm is issued. If the ACTIVE unit fails, and a subsequent transfer to the STANDBY1 unit also fails (where no STANDBY2 exists), no transfer back to the ACTIVE unit occurs, and a critical output report and alarm are generated. If a

STANDBY2 unit exists, a second emergency transfer attempt is made. If the second attempt to STANDBY2 fails, there is again no transfer back to ACTIVE, and the critical alarm is generated.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	AMA RECORD ON REMOTE/TOLL CALL FORWARDING
Feature no	F1239

FEATURE SYNOPSIS

This feature is applicable for DMS 200 or DMS 100/200 offices equipped with CAMA or TOPS and serving one or more RCF base offices provided with RCF-CAMA Mode feature (F1238).

This feature covers the following functions:

1. Serving of a separate I/C RCF trunk group from each designated RCF base office in addition to the regular I/C CAMA trunk group from that office.
2. Provisioning of standard AMA recording on the I/C RCF trunk group.
3. Generation of ANI wink signal (nominal 140 msec) on I/C RCF trunk group.
4. Provisioning of transparency to answer supervision from the terminating end of the RCF call to pass it back to the originating RCF base office.
5. Routing of ANI failed or timed-out RCF calls to appropriate tone or announcement, as these calls must not be routed to CAMA operator.

FEATURE DESCRIPTION

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	AMA RECORD OF TANDEM SWITCH SEIZURE - ONLY CALLS
Feature no	F2199

DESCRIPTION

Information (DA) type calls are received from a SXS switch via seizure indication only. Incoming DMS trunk group is listed in table - RCGRP - where it is associated with proper outgoing trunk group to DA position switchboard. However, customer also wants ability to record the incoming DA call on AMA tape for statistical purposes. Trunk groups listed in RCGRP table have no trunk group characteristics, resulting in no ANI request signal being transmitted back to originating office. Therefore, mechanism is required to optionally assign ANI request signal in RCGRP table, recognizable by DMS operating software.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	ADMINISTRATION
Feature	AMA FAILURE ROUTING OPTIONS
Feature no	F2475

FUNCTIONAL DESCRIPTION

1. BACKGROUND

The objective of AMA system is to record billing details of all chargeable calls onto a device (tape or disk).

During the call, most of the call-processing agencies store information about the call in the CCB. When the call ends (disconnects) the agency will get a recording-unit extension block, and copy the billing information to it. Then the recording-unit extension block is detached from the CCB and put on the EXT queue.

The AMA process periodically checks the EXT queue. If the EXT queue is not empty, then the data in the EXT queue is formatted into a specified layout (NT, ATT or SMDR format) and stored in a 2048-byte buffer. When this buffer is full it is written to the AMA device (tape or disk).

During the above process of recording charge information, the following cases might happen which will result in charge free calls. This feature provides routing options which can be used to charge toll calls during AMA problems/failure.

- 1) No AMA devices (or files) are available.
- 2) No recording-unit extension block is available.
- 3) An AMA process traps due to software bugs. At present, after fixing the problem a warm restart is required to recover the AMA system.

2. FEATURE DESCRIPTION

2.1 Type of Office

This feature will apply to DMS-100, DMS-100/200, DMS-200 switches only.

2.2 The Proposed Routing Options

The following illustrates the proposed different routing options under AMA failure for different DMS office configurations.

i) DMS-100 (LAMA) office or DMS-100/200 (LAMA/CAMA) combined office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

ii) DMS 200 (CAMA) office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

iii) DMS TOPS office

The present TOPS handles CAMA failure cases as follows:

a) due to no CAMA TOPS recording units:

The way TOPS handles CAMA call is to get a CAMA TOPS recording unit before collecting calling numbers. If the recording unit is not available, the call is blocked and routed to a treatment.

b) due to no devices(files) or process dead:

The call will be routed free of charge.

In case of condition (a), the calls will now be pegged under the AMAROUTE om register.

In case of condition (b), the calls will now be pegged under the AMAFREE om register.

No other changes will be made in the TOPS call handling because of the existing TOPS call processing design.

AMA restart process command will apply to the TOPS AMA process (see MM section for AMARESTART command).

3. ALARMS AND LOGS

If AMA failure is detected, both DIRP and OFFICE ALARM subsystem will generate alarms with log reports.

3.1 MAP Alarm Indications

The alarm indications will be displayed under IOD and EXT at the MAP MTC subsystem for the following failure cases (as defined in section 1) :

	IOD	EXT
a. no active file available:	NO AMA 3C3	1 CRIT 3C3
b. no recording unit:	AMA B 3C3	1 CRIT 3C3
c. process dead:	AMA B 3C3	1 CRIT 3C3

If there were more than one failed cases happened, the EXT and IOD MAP alarms will be cleared only if all the failed cases are recovered. Telco should check the DIRP logs for failed reasons.

3.2 Logs

There will be two logs: DIRP101 and EXT108 generated for AMA failure. Each failed case is indicated in DIRP101 log with stream name in SSNAME and failed reason in TEXT.

Only one EXT108 log showing AMAFAIL ON is available even though there might be more than one failed cases and only one EXT108 log showing AMAFAIL OFF is available when all the failed cases have been recovered.

Package	NTX044AA04 CENTRAL AUTOMATIC MESSAGE ACCOUNTING (CAMA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	FLEXIBLE LONG DURATION CALL REPORTING
Feature no	F2591

FEATURE SYNOPSIS

This feature gives the Telcos the ability to set the long-duration audit interval. Previously this interval was fixed to 24 hours.

This feature only affects the ama long-durations audits for NT AMA-Format offices. See FN section for more details.

FEATURE DESCRIPTION

This feature will provide capability for Lama and Cama (NT format only) to check for long-duration calls as per the time selected by the Telco. At present the only long-duration calls that are greater than 24 hours are checked. This will allow the Telco the ability to check calls that are greater than some specified hour that is specified by the Telco.

This feature is applicable for offices with NT AMA-Format. AT&T AMA-Format offices will not be affected by this feature.

Capability will be provided via OFCPARMS (OFCENG table) to allow the Telcos to change this long-duration as required. The default long-duration will be the same as is used at present (i.e. 24 hours). The values for AMA_LONG_DUR_AUDIT_INTERVAL can be in the range of (1 to 24) hours.

The NT-AMA-Format long-duration call logs (AMA112) are only produced for AMA calls on SCama Trunks and LAMA calls from lines. LCDR, SMDR, and AMA calls on TOPS Trunks are not included in the Long-Duration call audits.

LOG REPORTS AFFECTED - AMA112

DB TABLES AFFECTED - OFCENG

REFERENCES

FDOC BR0591 for log and data schema changes.

Package	NTX045AA01 USAGE SENSITIVE PRICING(USP BELLCORE FORMAT)
Feature set	STATION FEATURES
Feature	CALL FORWARDING - USAGE SENSITIVE PRICING(BELLCORE
Feature no	F2777

FEATURE SYNOPSIS

This feature allows any single party POTS line in a Bellcore AMA office to acquire the call forwarding subscriber option for one usage by dialing the access code 72#.

FEATURE DESCRIPTION

A flat rate call forwarding subscriber pays a set rate for the unlimited use of the call forwarding option. On the other hand, the CFW-USP subscriber pays a set rate for each actual use of the call forwarding (CFW) feature.

This feature equips single-party POTS lines in a Bellcore AMA office with the call forwarding option for a single usage. This capability is provided when a subscriber without the flat rate CFW option dials the access code 72#. If the option is successfully added to the line, a confirmation tone is returned, and the subscriber can follow the normal call forwarding routine (see GFX020AB and Sect. 120 of NTP 297-2101-451). If the option cannot be added to the line for any reason (feature not available in the switch, not a Bellcore AMA office) the subscriber is sent to treatment. The subscriber dials 73# to deactivate the CFW-USP option. At the time that the CFW-USP feature is deactivated, the option is removed from the subscribers line.

There are three types of Bellcore AMA records which can be produced for both flat rate and USP call forwarding (POTS): activation, deactivation, and continuation records. Activation records use call code 031 with structure code 00614. Deactivation and continuation records use call code 031 with structure code 00096.

The service feature field in activation, deactivation and continuation records distinguishes between a flat rate call forwarding subscriber (value "12") and a CFW-USP subscriber (value "0"). AMA records produced for the forwarded leg of a call will contain "12" in the service feature field for both flat rate and USP. This feature cannot be used by a subscriber if the office is taking an image.

Ref:

GFD GFX045AA Usage Sensitive Pricing
GFD GFX020AB Vertical Services
NTP 297-1001-128 AMA Bellcore Format

Package	NTX045AA01 USAGE SENSITIVE PRICING(USP BELLCORE FORMAT)
Feature set	USAGE SENSITIVE ADMIN
Feature	LINE DENIAL OF USP VERTICAL PARTS.
Feature no	F2922

FEATURE SYNOPSIS

This feature provides the ability to activate and deactivate call forwarding usage sensitive pricing (CFUSP) on a per office basis. This feature also permits denial of CFUSP on a per line basis.

FEATURE DESCRIPTION

This feature provides two methods of controlling CFUSP:

- office wide control
- per line control

A new office parameter USP_ENABLED is added to be datafilled Yes (Y) or No (N). A new line option CUSD is added for subscribers who do not want to use CFUSP option. This option can be assigned via SERVORD.

Ref: AL0426 FDOC

NTX048AA04 Status: RTM SYNCHRONIZATION

INTERFACES	:	
INCOMING PHASE DETECTION ON STANDARD DS-1 RATE INTERFACE		F0592
PRE-SELECTED ALTERNATE MASTER/SLAVE (PAMS) OPERATION		F0593
MAINTENANCE AND ADMINISTRATION :		
SYNCHRONIZATION DISPLAY AND CONTROL		F0743
MAINTENANCE	:	
SYNC CLOCK MAINTENANCE		F5989
MASTER CLOCK SYNCHRONIZATION FOR E_CORE		F6484

Package	NTX048AA04 SYNCHRONIZATION
Feature set	INTERFACES
Feature	INCOMING PHASE DETECTION ON STANDARD DS-1 RATE INT
Feature no	F0592

DESCRIPTION

With this feature the active clock is synchronized to a specified DS-1 line. The DMS will phase lock to the bit stream received on the incoming DS-1 timing link. The 8 KHz multiplexing frame signal on the DS-1 line is used for synchronization of the clock. Elastic storage in each incoming DS-1 line is used to buffer any phase variations between the data streams on the timing link DS-1 line, and all other incoming DS-1 lines in the office. The DMS may also act as a master-of-slaves and provide its clock to other slaves.

For reliability, two DS-1 timing links are assigned between each office. One timing link is used for synchronization and the other operates in a standby mode.

The timing links are assigned in office data.

Package	NTX048AA04 SYNCHRONIZATION
Feature set	INTERFACES
Feature	PRE-SELECTED ALTERNATE MASTER/SLAVE (PAMS) OPERATI
Feature no	F0593

DESCRIPTION

A master-slave (MS) synchronization scheme has been adopted by Canada and the VS Bell System. The pre-selected alternate Master-Slave (PAMS) synchronization is a variation of the MS synchronization.

In the simple MS arrangement each slave mode obtains its timing information via one DS-1 input directly from one other node at a higher level in the timing hierarchy.

In a PAMS arrangement, each slave mode is slaved directly via one DS-1 input to one other node at a higher level in the timing hierarchy. However, in the event of this primary link a pre-selected alternative source, which may be a mode at the same level in the hierarchy, but not lower switchover to the alternative timing link is automatic in the event of a failure of the primary link.

Package	NTX048AA04 SYNCHRONIZATION
Feature set	MAINTENANCE AND ADMINISTRATION
Feature	SYNCHRONIZATION DISPLAY AND CONTROL
Feature no	F0743

DESCRIPTION

a) Synchronization System

The DMS clock system is duplicated with the standby clock synchronized to the active clock. The clock accuracy and stability allows the DMS to be used as a master in a hierarchal synchronization system using DS-1 links as the timing links. A switch from active to standby clock does not generate frequency or phase differences to the slave offices.

The active clock can also be synchronized to external reference signals of 10.240, 10.0, 5.0, 2.50, 2.048 or 1 MHz by selecting suitable back plane options.

b) Display and Control

The status of the synchronizable clock system is displayed on the MAP. The display includes:

status of active and standby clocks,
status of primary and secondary timing links,
slip count on timing links.

Commands available at the MAP include:

switch clock activity
switch timing links
adjust clock frequency
synchronize active clock to primary timing link
synchronize standby clock to active clock
drop synchronization

Package	NTX048AA04 SYNCHRONIZATION
Feature set	MAINTENANCE
Feature	MASTER CLOCK SYNCHRONIZATION FOR E_CORE
Feature no	F6484

FEATURE SYNOPSIS

This feature provides software support for Stratum 2 clock synchronization in slave offices.

FEATURE DESCRIPTION

This feature provides the software necessary to allow the DMS system to synchronize to a Stratum 2 level signal as a slave office.

The synchronous clock system provides a facility for the DMS system to synchronize its clocks with one of three possible sources. They are:

- a) Via external reference links which provide a direct clock source to synchronize to (master external office).
- b) Via a clock source extracted from incoming digital trunks (slave office).
- c) Via an internal clock for synchronizing the rest of the office (master internal office).

The different office configurations which are handled in the synchronous clock system to provide the DMS with the capability of being any node in the timing network are as follows:

- a) A master-external office where the clock source is externally supplied.
- b) A master-internal office where the DMS system clock is used to synchronize the office.
- c) A slave office configuration where the clock reference source is extracted from the incoming digital trunks and then used to synchronize the office system clock.

Digital trunks selected as timing links must in general be as diverse in route as possible so as to maximize reliability. They must also be on separate digital carrier modules (DCMs) in the DMS office to prevent loss of both timing links if the DCM becomes out of service. Digital trunk controllers (DTCs) and line trunk controllers (LTCs) are more reliable due to the duplication of their control unit. Therefore no restrictions are placed on the timing links being on the same peripheral module (PM) but they must be on different interface cards.

This feature only supports the slave office configuration. Other features support the master-external office and master-internal office configurations.

Ref: AL0422

Package	NTX048AB01 SYNCHRONIZATION - CESIUM MASTER CLOCK
Feature set	INTERFACES
Feature	CESIUM MASTER CLOCK INTERFACE
Feature no	F0591

DESCRIPTION

Synchronization of a digital network, and the use of plesiochronous (not synchronized but virtually zero slips) operation on digital links with other networks requires the use of a highly accurate clock. CCITT recommendations for digital links between national networks require a clock with an accuracy of 1 part in 10". For this purpose the DMS clock will use its capability of synchronization to an external source, the external reference being a cesium clock reference.

The cesium clock reference is mounted on a DMS type frame, termed 'Master Reference Frequency Frame' (MRFF). The MRFF has two in-service cesium clocks, each clock being independently powered and connected to its respective CMC clock circuit.

A third cesium reference clock (not powered up) is provided as a spare. Each cesium clock reference is connected to its associated CMC clock by a maximum of 200 feet of 50 ohm coax cable and control wiring. The control wiring allows DMS to provide indications of trouble on the MRFF equipment and allows DMS to operate status lamp (active, standby, spare, for each reference clock on the MRFF).

Each CMC clock circuit also has a beat frequency detector to monitor the difference in frequency between the two reference sources. Should the threshold be exceeded a diagnostic program will determine the faulty reference.

The MRFF will be capable of operating within the environmental specification of the DMS system. The oscillator accuracy will be maintained within $\pm 1 \times 10^{-10}$ in a magnetic field of up to 0.2 millitesla.

The MRFF requires two independent -48V supplies ('A' and 'B' feeds).

Each reference clock has an internal battery to maintain the oscillator output during temporary loss of power supplies.

NTX048BA02 Status: RTM SYNCHRONIZATION - STRATUM 3

INTERFACES	:	
SYNCHRONIZATION - STRATUM 3		F2540
MAINTENANCE	:	
STRATUM - 3 CLOCK SYNCHONIZATION		F6238

Package	NTX048BA02 SYNCHRONIZATION - STRATUM 3
Feature set	INTERFACES
Feature	SYNCHRONIZATION - STRATUM 3
Feature no	F2540

FEATURE SYNOPSIS

In the DMS network, synchronization is required in order to provide accurate timing between digital offices and to ensure reliable transmission of the digital bit stream. The offices are interconnected to form a hierarchy with the master office at the head and slave offices at the bottom. It is the master that provides the timing to the rest of the network. All offices will be synchronized to the master.

Synchronisation is accomplished by the clock hardware in the cmc and the DCM, via software control. Incoming timing signals are compared and the result used in a phase-lock loop (PLL) algorithm. The output is fed to a voltage-controlled oscillator (VCO) located in the CMC clock card. The parameters for the PLL are determined by the specifications of the particular oscillator being used. The software also monitors the clocks and timing links for various error conditions (slips,alarms etc.) and reports them as required.

In this feature, we are only concerned with Stratum-3 level offices. The purpose is to introduce new clock hardware for the Stratum-3 office and revise the existing software that controls it.

FEATURE DESCRIPTION

Synchronization of digital offices, in the DMS network, is achieved by phase-locking to a digital carrier connected to another office in the timing hierarchy. The office can be in a higher level or another Stratum-3. A distributed phase_lock loop is formed by the clock oscillator, whose output is distributed throughout the network, a digital phase comparator in the Digital Carrier Module, and the controlling software which controls the oscillator frequency via a D/A converter. Information is passed through the internal message system of the DMS.

There are currently two types of oscillators used in the CMC hardware for synchronization. Both offer similar performance but differ slightly in their specifications and operation. To introduce the Stratum-3 office in the DMS network, a new oscillator for the CMC clock needs to be used, that will meet the differing requirements. This will result in a new set of operating parameters for the control loop algorithm and a modification of existing software to run it.

The new voltage-controlled crystal oscillator is temperature controlled and requires no heater to run. Frequency control has a negative response to input voltage; an increase in the input control voltage results in a

decrease in the output frequency. The output frequency range of +-105 Hz. (min.) is controlled by the input voltage range of 0-10 Volts with the nominal frequency at 5 V.

SOFTWARE/HARDWARE

With the introduction of the Stratum-3 office, changes have been made to the software that reflect the new hardware. As a result, the software is able to recognize which type of oscillator is currently installed and provide appropriate control for it. For this feature, new parameters have been chosen and new control software written for the Stratum 3 oscillator.

Package	NTX048BA02 SYNCHRONIZATION - STRATUM 3
Feature set	MAINTENANCE
Feature	STRATUM - 3 CLOCK SYNCHONIZATION
Feature no	F6238

FEATURE SYNOPSIS

This feature provides software support for Stratum-3 clock synchronization in slave offices.

FEATURE DESCRIPTION

This feature provides the software necessary to allow the DMS system to synchronize to a stratum-3 level signal.

The synchronous clock system provides a facility for the DMS system to synchronize its clocks with one of three possible sources. These are:

- a) Via external reference links which provide a direct clock source to synchronize to.
- b) Via a clock source extracted from incoming digital trunks.
- c) Via an internal clock for synchronizing the rest of the office.

The different office configurations which are handled in the synchronous clock system to provide the DMS with the capability of being any node in the timing network are as follows:

- a) A master-external office where the clock source is externally supplied.
- b) A master-internal office where the DMS system clock is used to synchronize the office.
- c) A slave office configuration where the clock reference source is extracted from the incoming digital trunks and then used to synchronize the office system clock, digital trunks selected - as timing links must in general be as diverse in route as possible so as to maximize reliability. They must also be on separate digital carrier modules (DCMs) in the DMS office to prevent loss of both timing links if the DCM becomes out of service. Digital trunk controllers (DTCs) and line trunk controllers (LTCs) are more reliable due to the duplication of their control unit. Therefore no restrictions are placed on the timing links being on the same peripheral module (PM), but they must be on different interface cards.

This feature only supports the slave office configuration, other features support the master-external office and master-internal office configurations.

Ref: BC2296, AL0158

Package	NTX048CA02 SYNCHRONIZATION - STRATUM 2
Feature set	SYNCHRONIZATION
Feature	SYNCHRONIZATION - STRATUM 2
Feature no	F2557

FEATURE SYNOPSIS

This feature provides CC software to support a Stratum 2 clock for DMS 200.

FEATURE DESCRIPTION

This feature allows the DMS switches to become a higher node in the digital telephone communications timing network. The network consists of a Stratum 1 clock where Stratum 2 clocks sync to it and Stratum 3 clocks sync to the Stratum 2 clocks etc.

The changes to software to allow Stratum 2 clocks will not decrease from the capabilities of the Stratum 3 or Bliley clocks already in operation on DMS switches.

All of the possible configurations will still be allowed (i.e. slave master-int, master-ext, non-sync-clock).

Package	NTX048CA02 SYNCHRONIZATION - STRATUM 2
Feature set	MAINTENANCE AND ADMINISTRATION
Feature	STRATUM II - DRIFT INDICATION
Feature no	F2828

FEATURE SYNOPSIS

This feature allows the Operating Company to set a lower limit on the percent drift permitted before an alarm is raised. The lower limit can be +/-10⁴ to +/-75⁴. The upper drift limit remains at +/-75⁴.

The Operating Company can also specify the level of alarm that is raised (no alarm, minor, major) for both the lower drift percent and the upper drift percent.

FEATURE DESCRIPTION

Three fields are added to table SYNCLK to set the lower drift percent and the alarm levels to be raised for the lower and upper drift percent.

Field LOWDRIFT sets the lower drift percent allowed before an alarm is raised.

Field LALRMLVL sets the level of alarm that will be raised when the lower drift percent is reached.

Field UALRMLVL sets the level of alarm that will be raised when the upper drift percent is reached.

The default for these fields are 75⁴, minor and minor.

Ref: FDOC BR0828

NTX049AC01 Status: RTM CIRCLE DIGIT IDENTIFICATION

NUMBER IDENTIFICATION/CHARGING :
CIRCLE DIGIT IDENTIFICATION

F0604

Package	NTX049AC01 CIRCLE DIGIT IDENTIFICATION
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	CIRCLE DIGIT IDENTIFICATION
Feature no	F0604

DESCRIPTION

Circle Digit Identification (CDI) is used to determine the calling subscribers directory number for billing purposes on toll calls from exchanges with multiparty circle digit format.

Circle digit caters for single party and two party lines (not hotel, coin, and message rate line options) in areas where a uniform dialing pattern is implemented.

Circle digit identification is used for toll calls where digits 1+ and 0+ are used as prefixes.

Circle digit identification provides for the following typical call types:

Non-Coin DDD 1+CD³ + 7/10 digits
 Non-Coin DDD 0+CD³ + 7/10 digits

The following typical types are not catered for:

Non-Coin International 01+CD³ +8-15 digits
 Non-Coin International 011+CD³ +8-15 digits
 Non-Coin DDD (prefix not dialed) ³ CD+7/10 digits

³CD = Digits 2 to 9 (0 and 1 conflict with International dialing)

Typical CDI functions required are as follows:

- subscriber dials 1+CD+NPA+NNX-XXXX
- DMS matches circle digit and line appearance to obtain calling directory number
- DMS proceeds to send ANI information or in case of LAMA makes the appropriate entry.

Package	NTX049AD01 SINGLE PARTY REVERTIVE CALLING
Feature set	SERVICES
Feature	SINGLE PARTY REVERTIVE CALLING (INTERCOM)
Feature no	F0598

DESCRIPTION

This feature allows subscriber to communicate with people located at extension phones. Feature functions as follows:

- a) Subscriber dials his own number and is connected to a recorded announcement. (Similar to REA revertive calling)
- b) Subscriber goes on-hook and ringing voltage is applied to line. Since the ringers of the subscriber and the extensions are tuned to the same frequency all phones will ring with the application of the ringing voltage.
- c) When the person at the extension goes off-hook, ringing will stop at all phones and the initiator of the call can go off-hook and engage in conversation.

Package NTX049AE01 NORTH ELECTRIC ANI FORMAT GENERATION
 Feature set NUMBER IDENTIFICATION/CHARGING
 Feature AMR-5 NORTH ELECTRIC ANI(GENERATION)
 Feature no F0603

DESCRIPTION

The North Electric ANI new format (AMR-5) is:

KP + CAT + 7D + ST³ /ST

where CAT - category digits is a two digit code used to convey the following information:

TENS DIGIT

5 Home area tributing 1
 6 Foreign area tributing 2
 7 Foreign area tributing 2

UNITS DIGIT

0 Non coin
 1 Automatic time & charges
 2 Hotel
 3 Coin
 6 Error or ONI
 7 Denial Toll

The tens digit is not call dependent. It depends only on the location of the local office with respect to the AMR-5 system.

ST may be any of the following signals:

Normal	- ST
ANI Fail	- ST2p
Station to Station (1+)	- KP
Premium (0+)	- STP

ST³ may be one of the following:

Normal	- ST
ANI Failure	- ST2p

As an end office, DMS-100 is required to generate North Electric ANI signalling format as detailed above.

Package	NTX049AE01 NORTH ELECTRIC ANI FORMAT GENERATION
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	TIME AND CHARGES SUBSCRIBER LINE CLASS
Feature no	F0614

DESCRIPTION

Certain telcos in U.S. offices time and charge feature to subscribers (e.g. Florists, lawyers) for 1 + DDD calls. A time and charge call is identified to the toll office by a special category code. (Assuming AMR-4/5 North Electric ANI format), e.g. 151 or 171.

The DMS-200 toll office will receive the calling AMR-5 number format and regenerate it to the NXID switch. The NXID will print the call details at a printer where a clerk will calculate and phone back the charges to the T and C subscriber.

If the end office is a DMS-100, a new line class code ATC (Automatic Time and Charge) has been defined to associate a T&C subscriber with the proper category code to be generated.

DMS ALL BCS27 Feature Description Manual	890124
NTX049AG01 Status: RTM ITT ANI FORMAT (RECEIPT)	
NUMBER IDENTIFICATION/CHARGING : ITT ANI FORMAT (RECEIPT)	F0610
Section B Available Features NTX049AG01	Page 1092

Package	NTX049AG01 ITT ANI FORMAT (RECEIPT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ITT ANI FORMAT (RECEIPT)
Feature no	F0610

DESCRIPTION

DMS will receive the following ITT ANI format from the end offices:

Call Type	ANI (to DMS-200)
-----	-----

1 + FR non coin	KP + 101 + 7D + ST
1 + multi-party	KP + 121 + office code + ST
ANI Fail	KP + 99 + ST

In the case of 1+ flat rate call, DMS-200 will switch the call to the Intertoll trunk group to the #4 ESS.

In the case of 1+ multiparty and ANI Fail, DMS-200 will switch the call to ONI trunk group and operators service will be provided by N.T. Camaboards. The call will be suspended in the DMS-200 until the operator keys in the calling number to the DMS-200 whereby after validity check the call will be switched to the #4 ESS.

DMS ALL BCS27 Feature Description Manual	890124
NTX049AH01 Status: RTM COME AGAIN SIGNALLING	
SIGNALING AND SUPERVISION : COME AGAIN SIGNALLING	F0607
Section B Available Features NTX049AH01	Page 1094

Package	NTX049AH01 COME AGAIN SIGNALLING
Feature set	SIGNALING AND SUPERVISION
Feature	COME AGAIN SIGNALLING
Feature no	F0607

DESCRIPTION

This signal is used to interface 1+ and 0+ _ calls with ADDDS equipment. Coin and non-coin calls are routed to the ADDDS via separate trunk groups.

Calls are handled identically to 1+ and 0+ _ calls to TOPS with the following exceptions:

- a) Called number outpulsed in DP
- b) Information digit precedes called number

1+	,	I = 6
0+	,	I = 7
0-	,	I = 3

- c) For coin calls, inband coin return signal sent by ADDDS after calling number outpulse. In present configuration, local office uses this signal to return the coin and then provide coin presence indication to the ADDDS. DMS-100 will not support this feature - the coin return signal will be ignored.

Note: Coin return will be performed automatically by DMS-100 for these calls.

Package	NTX049AL01 TIME AND TEMPERATURE ANNOUNCEMENT
Feature set	SERVICES
Feature	844 SERVICE CODE FOR TIME AND TEMPERATURE
Feature no	F0850

DESCRIPTION

DMS has the capability of receiving and analyzing 844 service code call and switch it to the time and temperature announcement trunk.

NTX051AA02 Status: RTM AUTOMATIC TRUNK TESTING

MAINTENANCE AND TESTING :
AUTOMATIC TRUNK TESTING FOR ORIGINATING TEST TYPES F0616

Package	NTX051AA02 AUTOMATIC TRUNK TESTING		
Feature set	MAINTENANCE AND TESTING		
Feature	AUTOMATIC TRUNK TESTING	FOR ORIGINATING TEST	
Feature no	F0616		

DESCRIPTION

ATT LEVEL IS ACCESSED BY TELESCOPING THROUGH THE MAINTENANCE (MTCE), TRUNKS (TRKS), TRUNK TEST POSITION (TTP) LEVELS OF THE MAINTENANCE SUB-SYSTEMS.

THE FOLLOWING ARE THE AUTOMATIC SCHEDULABLE TESTS WHICH CAN BE PERFORMED:

- 103 TEST LINE (TOLL OFFICE) - NON-SYNCHRONOUS TEST LINE (LOCAL OFFICE)
- SYNCHRONOUS TEST LINE (LOCAL OFFICE) - E & M LEAD TEST - REPEAT 2 TEST - 100 TEST LINE (TOLL OFFICE) - 102 TEST LINE (TOLL OFFICE) - 104 TEST LINE (TOLL OFFICE) - MILLIWATT TEST LINE (TOLL OFFICE) - BALANCE TEST LINE (LOCAL OFFICE) - LOOP AROUND TEST

THE FOLLOWING FEATURES ARE AVAILABLE WITH ATT:

- RETEST ON PERIODIC TEST FAILURES - FREQUENCY PERIOD CAN BE SPECIFIED (I.E. DAILY, WEEKLY, QUARTERLY, ETC.) - TEST DATA CAN BE SPECIFIED (I.E. EML, FREQUENCY, LEVEL, ETC.) - RECYCLE (UP TO 99 TIMES) A TEST ON A GROUP OF TRUNK CONTINUOUSLY - SELECTABLE PRINTOUT POSSIBLE - TRANSMISSION THRESHOLDS OR LIMITS CAN BE SET - DIAGNOSTICS ON TEST EQUIPMENT AND TEST LINES TO ENSURE PROPER OPERATION.

NTX052AB02 Status: RTM REMOTE OFFICE TEST LINE (ROTL)

MAINTENANCE AND TESTING	:	
INTERFACE TO CENTRALIZED ATT SYSTEMS VIA APC ROTL V		F0619
COMPATIBILITY WITH:	CAROT	F0737
COMPATIBILITY WITH:	RAMPART	F0738
ROTL TRUNK NUMBER TABLE		F3756

Package NTX052AB02 REMOTE OFFICE TEST LINE (ROTL)
Feature set MAINTENANCE AND TESTING
Feature INTERFACE TO CENTRALIZED ATT SYSTEMS VIA APC ROTL
Feature no F0619

DESCRIPTION

A) FEATURE DESCRIPTION

THE ROTL CAPABILITY IS AN ESSENTIAL PART OF THE CENTRALIZED AUTOMATIC TRUNK TESTING SYSTEM. THE MAIN PURPOSE OF THIS SYSTEM IS TO SCHEDULE AND TO PERFORM TRANSMISSION AS WELL AS SIGNALLING TESTS ON TRUNK CIRCUITS OVER A WIDE AREA (I.E. TRUNKS CONNECTING DIFFERENT OFFICES IN THAT AREA). EXAMPLES OF SUCH CENTRALIZED SYSTEMS WOULD BE CAROT, RAMPART ETC.

IN ORDER TO PERFORM THE MAINTENANCE TESTING OVER A SPECIFIC CIRCUIT, SUITABLE EQUIPMENT WILL BE CONNECTED AT ONE END TO INITIAL AND CONTROL THE TEST SEQUENCY WHILE RESPONDING TEST EQUIPMENT WILL BE CONNECTED AT THE FAR END. THE TEST RESULT WILL BE COMMUNICATED TO THE CENTRALIZED PROCESSOR ON THE COMPLETION OF EACH TEST.

THE CONTROLLING END IS CALLED THE ROTL AND MUST PROVIDE THE FOLLOWING CAPABILITIES:

- A) TO COMMUNICATE WITH THE CENTRALIZED PROCESSOR IN A PRE-DETERMINED FORMAT
- B) TO MAKE DIRECT/INDIRECT CONNECTION TO THE CIRCUIT WHICH IS TO BE TESTED
- C) TO INITIAL AND PERFORM THE REQUESTED TEST(S)
- D) TO REPORT THE MEASURED RESULT TO THE CENTRAL PROCESSOR
- E) THE ROTL ALSO HAS THE CAPABILITY TO PERFORM THE RESPONDER FUNCTION AS A TERMINATING 105 TEST LINE.

IN THE DMS IMPLEMENTATION, THE ROTL FEATURE IS PROVIDED BY THE AUTOMATION PRODUCTS COMPANY (APC) MODEL 1066 ROTL/RESPONDER WITH SUITABLE INTERFACE TO THE DMS. B) ROTL ACCESS

THE ACCESS OF ROTL FROM THE CENTRAL PROCESSOR IS VIA DIALABLE SUBSCRIBER LINES IN A TWO LINE HUNT GROUP. THE ACCESS LINES ARE CONNECTED TO A CLASS 5 OFFICE WHILE THE ROTL CAN BE PHYSICALLY LOCATED IN OFFICES OF ALL CLASS. AFTER THE

CONNECTION IS ESTABLISHED AND THE ROTL IS READY TO PROCEED WITH THE TEST, THE ROTL WILL COMMUNICATE WITH THE DMS FOR TRUNK SELECTION VIA THE TEST PORT AND SCAN/DISTRIBUTE POINTS AS DESCRIBED LATER.

C) ROTL TEST PORT

EACH ROTL REQUIRES 2 TEST PORTS INTERFACED WITH DMS. THE TEST PORT INTERFACE IS PROVIDED BY A SPECIAL 4-WIRE E & M TYPE II CIRCUIT WITH 900 OHM IMPEDANCE AND WINK START CAPABILITY. THE ROTL WILL SEIZE ONE OF THE TEST PORTS WHEN IT IS READY TO PROCESS THE TEST REQUEST FROM THE CENTRAL PROCESSOR. DMS WILL ATTACH A MF RECEIVER UPON SEIZURE ON THE TEST PORT. WINK START SIGNAL WILL BE RETURNED WHEN MF RECEIVER IS ATTACHED. APPROPRIATE CONTROL SIGNAL, IN THE FORM "TEST PROGRESS TONE" WILL BE APPLIED/REMOVED FROM ROTL VIA THE ACCESS LINE TO THE CENTRAL PROCESSOR UNTIL BOTH ROTL AND DMS ARE READY TO RECEIVE THE TEST INSTRUCTIONS IN THE FORM OF MF DIGITS CALLED PRIMING DIGITS FOR ROTL AND DMS. THE PRIMING DIGITS INCLUDES TRUNK SELECTION INFORMATION AND THE TEST INSTRUCTION. DMS WILL PRIMARILY CAPTURE THE TRUNK SELECTION INFORMATION AND CONNECT THE SELECTED TRUNK TO THE TEST PORT. THE MF ENCODED TEST INSTRUCTION WILL BE CAPTURED BY THE ROTL. THE REQUESTED TESTS WILL BE PERFORMED BY THE ROTL INTERNAL HARDWARE AFTER THE CONNECTION IS ESTABLISHED BY DMS. DMS WILL ALSO SEIZE AND OUTPUT ON THE SELECTED TRUNK WITH THE DIGITS INDICATED IN THE PRIMING INFORMATION FROM THE CENTRAL PROCESSOR. THE OUTPUTTED DIGITS WILL RESULT IN THE ATTACHMENT OF PROPER DETERMINATING TEST EQUIPMENT AT THE FAR END.

D) SCAN AND SIGNAL DISTRIBUTE POINTS

THERE WILL BE 4 SCAN POINTS AND 4 SIGNAL DISTRIBUTE POINTS ASSOCIATED WITH EACH TEST PORT. DMS AND ROTL WILL MAKE USE OF THE SCAN AND SIGNAL DISTRIBUTE POINTS TO ACKNOWLEDGE AND TO CONTROL THE TEST SEQUENCE.

E) 105 TEST LINE (RESPONDING)

THE ROTL CAN BE OPTIONALLY EQUIPPED WITH UP TO 6 105 TEST LINES. THE 105 TEST LINES WILL INTERFACE TO DMS VIA THE SPECIAL TRUNKS SUCH AS THE ONES USED FOR THE TEST PORTS. F) SPECIAL TRUNKS FOR ROTL INTERFACE

SINCE THE ROTL TRANSMISSION TEST EQUIPMENT IS NOT CAPABLE TO DETERMINE AND ALLOW FOR THE DIFFERENCE IN TEST-LEVEL-POINTS

(TLP) AT THE FAR END OF THE TRUNK UNDER TEST, DMS WILL MAKE USE OF THE SPECIAL SOFTWARE CONTROL PADS (0-7DB) ON THE SPECIAL TRUNK TO ALIGN THE DIFFERENCES IN THE TLP WHEN TRANSMISSION MEASUREMENTS ARE MADE BY THE ROTL.

G) REPORTING OF RESULT

DMS IS ONLY RESPONSIBLE FOR THE TRUNK SELECTION, OUTPULSING OF REQUESTED DIGITS AND THE CONTROL OF THE TRANSMISSION PADS ON THE ROTL TEST PORT INTERFACE TRUNKS. ALL OTHER MEASUREMENT FUNCTIONS INCLUDING REPORTING OF RESULTS WILL BE PERFORMED BY THE RESPONDER, ROTL AND THE CENTRAL PROCESSOR USING IN-BAND SIGNAL AND IS THEREFORE TRANSPARENT TO DMS.

H) TYPE OF TESTS

DMS AND ROTL WILL SUPPORT THE FOLLOWING TEST VIA THE ROTL INTERFACE.

- I) 100 TEST LINE
- II) 102 TEST LINE
- III) 103 TEST LINE
- IV) 105 TEST LINE
- V) NON-SYNCHRONOUS TEST LINE

Package NTX052AB02 REMOTE OFFICE TEST LINE (ROTL)
Feature set MAINTENANCE AND TESTING
Feature COMPATIBILITY WITH: CAROT
Feature no F0737

SEE FEATURE NUMBER F0619

Package NTX052AB02 REMOTE OFFICE TEST LINE (ROTL)
Feature set MAINTENANCE AND TESTING
Feature COMPATIBILITY WITH: RAMPART
Feature no F0738

SEE FEATURE NUMBER F0619

Package	NTX052AB02 REMOTE OFFICE TEST LINE (ROTL)
Feature set	MAINTENANCE AND TESTING
Feature	ROTL TRUNK NUMBER TABLE
Feature no	F3756

FEATURE DESCRIPTION

INTRODUCTION

The purpose of this feature is to provide a mapping facility between the CLLI group numbers residing in the CAROT (Centralized Automatic Reporting on Trunks) data base and the actual CLLI groups residing in the DMS system. This table may also be used in the future by applications other than ROTL.

This has been necessary because the indices to the CLLI table as known by the CAROT data base may change owing to introduction of new software. New software, adding fixed CLLI groups would have such entries added to the top of the CLLI table.

At present, the ROTL collector (module ROTLMCOL) assumes the digits collected, representing the trunk group, to be the actual CLLI group. Thus, without adjusting the CAROT data base, the trunk group number as supplied by the CAROT may no longer be assumed to be the actual CLLI group.

TABLE

It is cumbersome to change the CAROT data base to reflect the above change in the CLLI table. Hence, a new table called TRKNAME will be introduced in DMS which will contain a list of all the CLLI's in the CLLI table in the order known by the CAROT. On a BCS application, the table TRKNAME will be dumped and any new CLLI entries introduced in the CLLI table added at the end of the table. Such new entries should also be included in the CAROT data base. Thus, although the CLLI table may not be in agreement with the CLLI's in the CAROT data base, the TRKNAME table will preserve compatibility between DMS and the CAROT data base. On receiving a CLLI group number from CAROT, the ROTL (Remote Office Test of Line) software in DMS will index the TRKNAME table to access the correct CLLI as required by the CAROT system.

Initially, the table TRKNAME will be datafilled according to 'string range' and 'common_language_name' as output by the DDEDIT command 'PRINTTYPE COMMON_LANGUAGE_NAME DDL', presuming that the CLLI entries in the CAROT data base is in the same order as that which exists in the CLLI table. An example of some entries in the TRKNAME table is given below:

TABLE: TRKNAME

CLLINDX ----- 0 95 BOTTOM	TRKCLLI ----- SYNCH ITDP1
---	---

The above entries were arrived at according to the DDEDIT command 'PRINTTYPE' as shown below. In the past, this output has been used to build CAROT data bases for DMS-100

DDE:

>PRINTTYPE COMMON_LANGUAGE_NAME DDL

COMMON_LANGUAGE_NAME 'SYNCH' 'ITDP1' 	STRING_RANGE 0 95
---	----------------------------------

For offices with an existing software patch (BDC10A13), to allow for the incompatibility between the CAROT data base and DMS, must have the TRKNAME table entries in the same order as that which exists in the CAROT data base.

NTX053AA05 Status: RTM MAINTENANCE ASSISTANCE PACKAGE

ADMINISTRATION	:	
CIRCUIT LOCATE		LINE F0007
CIRCUIT LOCATE		TRUNKS F0008
MAINTENANCE AND TESTING	:	
THRESHOLDING & EXCEPTION REPORTING (15MIN)		F0072
CALL TRACING (OFFICE PATH TRACE)		F0120
TRUNK CIRCUIT TYPE IDENTIFICATION		F0141
ALARM		SENDING AND CHECKING F0621
IDENTIFICATION OF ALARMS		OUTPUT ANI DIGIT 8 F0623
INCOMING/OUTGOING TRUNK IRREGULARITIES PEG COUNT		F0628
PERIODIC REPORTING ON TRUNKS		F0630
TROUBLE LOG EXPANSION		F0631
SIGNALING AND SUPERVISION	:	
REMOTE MAKE BUSY		F0736
MAINTENANCE AND TESTING	:	
ALARM SENDING AND CHECKING - ADEMCO NO 669		F1306
ADMINISTRATION	:	
NETWORK INTEGRITY ANALYSIS PACKAGE		F1471
BASIC OPERATIONAL MEASUREMENT-ACH CCH REGISTERS		F2159
SILENT SWITCHMAN		F2210
MAINTENANCE AND TESTING	:	
FLEXIBLE ALARM SENDING		F2521
ADMINISTRATION	:	
KILLER TRUNK REPORTING		F6309

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE		
Feature set	ADMINISTRATION		
Feature	CIRCUIT LOCATE	LINE	
Feature no	F0007		

DESCRIPTION

(i) General

Circuit Locate feature is used basically to identify the physical location of a posted card in the DMS-100 machine by invoking a menu command from the MAP. The circuit location will indicate the floor, aisle, frame, bay, shelf, card of the posted designated number (e.g. LEN or DN for lines).

(ii) Application

The feature definition currently existing in the DMS-100 Family is different in the Central Control Complex (CCC) and the Peripherals (LME, TME, DCE).

For the Peripherals (e.g. Line Cards), in order to determine the circuit location of a particular line card, the following steps are followed:

- a) post the LEN or DN
- b) invoke the "CIRCUIT LOCATE" command in the LTP

The response to (b) will indicate the floor, aisle, frame, bay, shelf, card of the posted LEN or DN.

For the CCC, the circuit location of a particular card is obtained as an output message resulting from a failure being detected by the maintenance subsystem called diagnostic. For example, a menu command "TST CPU", will result in a response:

```
Test Failed
Most likely cards follow:
Sq # LOC;aa bbcc ddee cardid
SHELF: dvt cc#;module #
```

The response will give the sequence number, order of card, location, floor number, equipment row and bay position, shelf and card position on shelf, product code, and device name and number.

The circuit location feature definition should be made uniform across all the DMS-100 System Cards so that:

1. An output message resulting from a failure being detected by a system called diagnostic contains the location of each card in the card list.

REFERENCES

- (i) RFF #247
- (ii) Design Intent Document, BNR.
- (iii) NTP 297-1001-511
 - NTP 297-1001-512
 - NTP 297-1001-513
 - NTP 297-1001-514
 - NTP 297-1001-515
 - NTP 297-1001-520

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE		
Feature set	ADMINISTRATION		
Feature	CIRCUIT LOCATE	TRUNKS	
Feature no	F0008		

SEE FEATURE NUMBER F0734

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	THRESHOLDING & EXCEPTION REPORTING (15MIN)
Feature no	F0072

DESCRIPTION

TO MINIMIZE CONTINUAL INSPECTIN AND MANUAL SORTING OF OUTPUT REPORTS, A SET OF ALGORITHM WITH TELEPHONE COMPANY ADJUSTABLE THRESHOLD LEVELS WILL BE USED TO DETERMINE WHEN A THRESHOLD REPORT MUST BE PRODUCED. ONCE A THRESHOLD HAS BEEN EXCEEDED, AN EXCEPTION REPOT WILLL BE GENERATED AND OUTPUT TO THE APPROPRIATE PRINTER AND WILL INCLUDE THE FOLLOWING.

1. TIME OF DAY THRESHOLD REACHED.
2. MACHINE "REPORT TYPE" NUMBER REFERENCE OR EQUIVALENT.
3. SIMPLE EXPLANATION OF THE THRESHOLD FAILURE.
4. THRESHOLD LEVEL IN EFFECT.
5. ALARM LEVEL INDICATION.

THE STATUS AREA OF THE APPROPRIATE VDU WILL CHANGE, IN PARALLEL WITH THE OUTPUT TO PRINTER, TO REFLECT THE TYPE OF EXCEPTION CON- DITION. THE EX- CEPTION REPOT CAN THEN BE EITHER CALLED UP AT THE VDU FOR TELESCOPE OR IN- SPECTED IN THE PRINTER.

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	CALL TRACING (OFFICE PATH TRACE)
Feature no	F0120

DESCRIPTION

THE CALL TRACING FACILITY CAN DETERMINE THE CHARACTERISTICS OF ANY CONNECTION SET UP THROUGH THE OFFICE. IT INDICATES WHERE THE SPECIFIED CIRCUIT IS CONNECTED IN THE OFFICE IF A CONNECTION EXISTS. IF POSSIBLE THE PATH THROUGH THE OFFICE WILL ALSO BE INDICATED. IF NO CONNECTION EXISTS, THE STATE OF THE CIRCUIT IS DETERMINED.

CALL TRACE REQUESTS ARE ORIGINATED MANUALLY BY TELCO PERSONNEL OR AUTOMATICALLY BY THE SYSTEM. MANUAL REQUESTS ARE INITIATED IN THE COURSE OF VARIOUS MAINTENANCE PROCEDURES SUCH AS LINE OR TRUNK TESTING. AUTOMATIC TRACES ARE INITIATED AS A RESULT OF SYSTEM DETECTED TROUBLES IN THE CALL CONNECTION OR TELCO INITIATED CAMP-ON TRACE REQUESTS.

IN BOTH LOCAL AND TOLL ENVIRONMENTS, TRUNKS AND SERVICE CIRCUITS CAN BE TRACED. LOCAL OFFICES ALSO PROVIDE LINE TRACE AND CALLING LINE IDENTIFICATION FACILITIES. THESE ALLOW TELCO PERSONNEL TO CAMP-ON A SPECIFIED CUSTOMER LINE BY REQUESTING AN AUTOMATIC TRACE OF ALL CALLS ORIGINATING ON OR TERMINATING TO THAT LINE EVERY TIME IT IS INVOLVED IN A CALL. THIS PROVIDES A POWERFUL NUISANCE-CALL TRACING FUNCTION.

REFERENCEREFERENCES -----

NTP 297-1001-107

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	TRUNK CIRCUIT TYPE IDENTIFICATION
Feature no	F0141

DESCRIPTION

The circuit locate feature in DMS allows the maintenance personnel to the physical location of a trunk marked as faulty as a result of diagnostic test. The location is identified by floor, bay, row, shelf and position of the circuit pack on the shelf.

In order to further identify the type of the trunk circuit, the diagnostic program displays to the maintenance personnel the card code of the faulty circuit pack, for example NT2X72, NT2X90, etc.

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE		
Feature set	MAINTENANCE AND TESTING		
Feature	IDENTIFICATION OF ALARMS	OUTPULSE ANI DIGIT 8	
Feature no	F0623		

DESCRIPTION

A) IDENTIFICATION OF ALARM

WHEN A CRITICAL, MAJOR OR MINOR ALARM IS TRIGGERED IN DMS-100, A VIRTUAL CALL IS ESTABLISHED TO THE TOPS OFFICE AND DMS-100 OUTPULSE KP 8 ST OVER A REGULAR TRUNK GROUP TO TOPS. THE TOPS OPERATOR WILL RECOGNIZE THIS AS BEING AN ALARM CONDITION FROM THE DMS-100 OFFICE AND WILL DIAL A PRE-ASSIGNED DIRECTORY NUMBER (TELCO ASSIGNABLE) TO DETERMINE THE TYPES OF ALARM IN THE END OFFICE. DIFFERENT TONES, I.E. HIGH, LOW, 120 IPM, 60 IPM ETC. ASSIGNABLE BY THE TELCO CHARACTERIZING THE VARIOUS ALARMS TYPE WILL THEN BE SENT TO THE OPERATOR. KNOWING THE TYPES OF ALARM (DIFFERENT TONES) THE OPERATOR WILL TAKE ACTION ACCORDINGLY.

B) IDENTIFICATION OF INTERCEPT

A CALL TO A DIRECTORY NUMBER WHICH IS PLACED ON INTERCEPT WILL BE ROUTED TO THE TOPS OPERATOR AND DMS WILL OUTPULSE KP - 9 - ST TO THE TOPS OFFICE. THE TOPS OPERATOR WILL RECOGNIZE THIS AS BEING AN INTERCEPTED CALL AND WILL PROVIDE INFORMATION AS APPROPRIATE.

AN "INTERCEPT" IS DEFINED AS ONE OF THE FOLLOWING:

- MACHINE INTERCEPT
- REGULAR INTERCEPT
- TROUBLE INTERCEPT
- HNPA CODE INTERCEPT
- UNASSIGNED NUMBER
- BLANK DIRECTORY NUMBER
- TERMINATING SUSPENDED SERVICE

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	INCOMING/OUTGOING TRUNK IRREGULARITIES PEG COUNT
Feature no	F0628

DESCRIPTION

TRUNK IRREGULARITIES WHICH MAY OCCUR DURING THE PROCESSING OF A CALL ARE DETECTED BY THE SYSTEM AND PEG COUNTS ARE PROVIDED ON A TRUNK GROUP BASIS. FOR EXAMPLE THE FOLLOWING IRREGULARITIES ARE PEGGED.

INCOMING -----

HITS PERMANENT SIGNALS PARTIAL DIAL MULTILATED DIGITS FALSE START PULSE
FALSE KEY PULSE EXTRA DIGIT

OUTGOING -----

INTEGRITY CHECK FAILURE FALSE SUPERVISION UNEXPECTED STOP - GO REVERSED
TRUNK

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	TROUBLE LOG EXPANSION
Feature no	F0631

DESCRIPTION

THE TROUBLE LOG PROVIDES A HISTORY OF ALL ERRORS ENCOUNTERED IN THE SYSTEM OVER A CERTAIN TIME FRAME. TWO MAJOR TYPES OF FAILURE CAN BE DIAGNOSED BY THE DMS-100, I.E. HARD FAULT AND TRANSIENT ERROR.

IF THE FAILURE IS A HARD FAULT, THE STATUS ON THE MAP IS CHANGED. THE TROUBLE IS ENTERED IN THE LOG. A TROUBLE RECORD IS OUTPUT TO ANY ONE OR MORE APPROPRIATE DEVICES. THE UNIT IS REMOVED FROM SERVICE AND THE APPROPRIATE REGISTERS ARE SCORED.

IF IT IS A TRANSIENT ERROR, THE EVENT IS ENTERED IN THE LOG. IF THE THRESHOLD IS EXCEEDED, THE STATUS IS CHANGED ON THE MAP AND A TROUBLE RECORD IS OUTPUT TO ANY ONE OR MORE APPROPRIATE DEVICES. THE APPROPRIATE EQUIPMENT FAILURE REGISTER IS SCORED.

EXAMPLES OF RELEVANT MAINTENANCE DATA ARE:

1. FAILURE CLASSIFICATION 2. END POINT INFORMATION 3. DIGITS RECEIVED/OUTPUTED 4. CALL PROGRESS 5. NETWORK ROUTE 6. SERVICE CIRCUIT USED 7. FUNCTION BEING PERFORMED 8. TIME OF OCCURRENCE

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	SIGNALING AND SUPERVISION
Feature	REMOTE MAKE BUSY
Feature no	F0736

DESCRIPTION

REMOTE MAKE BUSY IS A METHOD OF MAKING AN OUTGOING TRUNK BUSY BY MEANS OF OFF-HOOK SUPERVISION RECEIVED FROM THE TERMINATING END.

IN DMS, OUTGOING TRUNKS (CAMA AND TOPS) USING E&M LEAD SIGNALLING AND TRUNKS USING LOOP SIGNALLING HAS THE REVERSE MAKE BUSY CAPABILITY.

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	ADMINISTRATION
Feature	BASIC OPERATIONAL MEASUREMENT-ACH CCH REGISTERS
Feature no	F2159

DESCRIPTION

ACH, ATTEMPTS PER CIRCUIT PER HOUR AND CCH, COMPLETIONS PER CIRCUIT PER HOUR ARE TWO TRAFFIC MEASUREMENTS WHICH APPEAR IN OM REPORT TABLE (OMREPORT). THE OUTPUT UNIT IS IN CCS.

THIS REPORT IS SCHEDULABLE AT A MULTIPLE OF THE OM TRANSFER INTERVAL UP TO ONE HOUR. FOR EXAMPLE IF THE TRANSFER INTERVAL IS 15 SECONDS, THIS REPORT MAY BE SCHEDULED EVERY 15, 30 OR 60 MINUTES.

ACH AND CCH ALSO APPEAR IN THE NETWORK MANAGEMENT VDU STATUS DISPLAY. IN THIS CASE, ONLY TRUNK GROUPS WHICH EXCEED THE THRESHOLD VALUES WILL HAVE THEIR DATA OUTPUT.

NOTE THAT THERE ARE NO "MEASUREMENTS". THE ACH, CCH, ADNR, OVFL ARE CALCULATED AND OUTPUT IN THE REPORT. THEY ARE NOT SAVED OR MADE OTHERWISE AVAILABLE TO OTHER SOFTWARE OR DEVICES.

THE INTENT OF THIS REPORT IS TO REMOVE THE NEED FOR OUTPUTTING LARGE AMOUNTS OF DATA ASSOCIATED WITH TRUNK GROUPS (TRK GROUP) IN THE STANDARD OM LOG OUTPUT.

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	ADMINISTRATION
Feature	SILENT SWITCHMAN
Feature no	F2210

DESCRIPTION

The Silent Switchman feature enables a craftsperson to test the Outside Plant without the need of a second person in the office to open the cable pair.

Silent Switchman is access via a 3-digit code dialed from the customer station. Ten seconds of busy tone are given, and then the line is cut off for a period of up to 255 seconds (DMO modifiable), to allow testing on an open circuit. If the line is still off-hook when the cut-off relay is released, the line re-originates and receives dial tone.

Silent Switchman feature does not require any hardware at the terminating end. Routing is accomplished much like the synch-nonsynch test line which makes use of a fixed CLLI group.

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	FLEXIBLE ALARM SENDING
Feature no	F2521

FUNCTIONAL DESCRIPTION

Presently DMS-100 Family forwards minor, major, fuse/power, and critical alarms when the alarm sending feature (F0621) is used. In many cases it is desired to suppress the sending of certain alarms when ascs is turned on. This feature will allow the telco the option of deciding which alarm level is to be sent with the ascs enabled. The alarms are ordered in the following manner, from least critical to most critical:

- 1) minor
- 2) major
- 3) fuse/power
- 4) critical

A new office parm will be added to table ofcvar which will define the level of alarm sending. The variable 'acsc_disable_level' can take on the following values:

- 1) no_alm
- 2) min
- 3) maj
- 4) fsp
- 5) crit

All alarms of that value and less critical will not be sent on the ascs trunk when ascs is enabled. This feature will not affect the call-in aspect of ascs.

EXAMPLE

1) If in table ofcvar the acsc_disable_level tuple is set to 'min', then any minor alarms will not be sent to the ascs trunks when they occur.

2) If the acsc_disable_level tuple is set to 'fsp', then any minor, major, and fuse/power alarms will not be sent on the ascs trunks when they occur.

Package	NTX053AA05 MAINTENANCE ASSISTANCE PACKAGE
Feature set	ADMINISTRATION
Feature	KILLER TRUNK REPORTING
Feature no	F6309

FEATURE SYNOPSIS

This feature:

- Simplifies the method of designating trunk circuits that are to be observed for Killer Trunk (KT) properties.
- Provides a revised method of defining the time period over which trunk circuits are to be observed.
- Uses Device Independent Recording Package (DIRP) to send data to a specified device (KTRK data).
- Provides accurate detection and reporting of DMS-100F trunk circuits which exhibit any of the properties:
 - always idle (0 attempts, 0 ccs)
 - always busy (0 attempts, 36 ccs)
 - slow release (low attempt, high usage)
 - killer trunk (high attempt, low usage).

FEATURE DESCRIPTION

This feature comprises the revised Killer Trunk software package NTX876AA. It replaces the KT part of package NTX053AA (Maintenance Assistance Package) and improves upon the original KT design in reliability, performance and flexibility. The following significant changes are provided:

1. Improved reliability of usage measurement.
2. Reporting by command.
3. Flexible property definition.
4. List currently active trunks.
5. Relaxed restrictions on specifying trunk types.

Ref: FDOCS AF0531, AF0532

NTX054AA05 Status: RTM LINE TEST POSITION (LTP)

MAINTENANCE AND TESTING	:	
AUTOMATIC LINE TESTING		F0632
LTP - DIGITONE TESTING		F0634
LTP - MONITOR,TALK,BALANCE OFFHOOK TESTS		F0635
LTP - SEND FUNCTIONS(COIN & RINGING FUNCTIONS)		F0636
TONE GENERATION		F0637
SW CONTROL OF CUT-OFF RELAY ON POSTED LINES		F0638
LINE TRANSMISSION TESTS	INSERTION LOSS	F0731
LINE TRANSMISSION TESTS	QUIET TERMINATION	F1116
LINE TRANSMISSION TESTS	MILLIWATT	F1117
AUTO RETEST OF ALT FEATURES		F5429
RTP ROBUSTNESS		F5830

Package NTX054AA05 LINE TEST POSITION (LTP)
Feature set MAINTENANCE AND TESTING
Feature AUTOMATIC LINE TESTING
Feature no F0632

DESCRIPTION

AUTOMATIC LINE TESTING IN DMS-100 IS CAPABLE OF DOING THE FOLLOWING SCHEDULED TESTS:

- SHORT DIAGNOSTIC - EXTENDED DIAGNOSTIC - ON-HOOK BALANCE TESTS

THE NUMBER OF LINES, THE STARTING TIME AND THE TERMINATION TIME CAN BE SPECIFIED FROM THE LTP TERMINAL.

THE SHORT DIAGNOSTIC VERIFIES THE TRANSMISSION FUNCTION OF THE LINE CIRCUIT AND CAN BE EXPECTED TO DETECT 85% OF ALL CIRCUIT FAULTS. THE DIAGNOSTIC TAKES 2 SECONDS PER CIRCUIT TO RUN.

THE ON-HOOK BALANCE NETWORK TEST IS USED TO DETERMINE WHETHER A LINE IS A LOADED LINE OR A NON LOADED LINE. THE CORRECT BALANCE NETWORK IS ENTERED INTO DATA TABLES AND SWITCHED INTO THE LINE CIRCUIT. THIS TEST MAY BE PREVENTED FROM CHANGING THE SETTING OF BALANCE NETWORK TYPE AND UPDATING DATA BY INDICATING IN THE LINE DATA THAT A MANUAL OVERRIDE IS NEEDED FOR CHANGE.

THE OFF-HOOK BALANCE NETWORK TEST IS USED TO DETERMINE WHETHER A LINE CONNECTED TO A LINE CARD, IS A LOADED LINE OR A NON LOADED LINE AND IS A MORE ACCURATE TEST THAN THE ON HOOK BALANCE TEST. IN ADDITION TO THIS DETERMINATION, THE CORRECT BALANCE NETWORK IS ENTERED IN DATA TABLES AND SWITCHED INTO THE LINE CIRCUIT. THIS TEST MAY BE PREVENTED FROM CHANGING THE SETTING OF BALANCE NETWORK TYPE AND UPDATING DATA BY INDICATING IN THE LINE DATA THAT A MANUAL OVERRIDE IS NEEDED TO CHANGE THE DATA.

Package NTX054AA05 LINE TEST POSITION (LTP)
Feature set MAINTENANCE AND TESTING
Feature LTP - DIGITONE TESTING
Feature no F0634

DESCRIPTION

WHEN THE CRAFTSMEN IS IN THE MONITOR TALK MODE ON A LINE IN THE CONTROL POSITION, A DIGITONE/DP DIAL TEST CAN BE MADE.

AN LTP COMMAND PRIMES DMS FOR THE TEST AND THE CRAFTSMAN REQUESTS THE PERSON AT TH TELEPHONE SET TO KEY A SEQUENCE OF DIGITS (IF DIGITONE) OR DIAL A SEQUENCE O DIGITS (IF DP).

THE DIGITS RECEIVED AND DETECTED BY DMS ARE DISPLAYED AT THE LTP.

REFERENCE

NTP 297-2101-116 NTP 297-2101-516

Package	NTX054AA05 LINE TEST POSITION (LTP)
Feature set	MAINTENANCE AND TESTING
Feature	LTP - MONITOR, TALK, BALANCE OFFHOOK TESTS
Feature no	F0635

DESCRIPTION

THE LTP MONITOR TALK FEATURE ALLOWS A CRAFTSPERSON TO COMMUNICATE WITH THE SUBSCRIBER END VIA THE TEST ACCESS NETWORK (TAN) AND REQUIRES ON THE TEST ACCESS RELAY FROM THE SUBSCRIBER'S LINE CARD. SEPARATE MENU COMMANDS ARE SUPPLIED AT THE LTPLTA MAP LEVEL FOR MONITOR AND TALK.

THE OFF-HOOK BALANCE NETWORK TEST (BALNET) FEATURE AS IMPLEMENTED IN THE LTPLTA MAP LEVEL ALLOWS BOTH ON-HOOK AND OFF-HOOK BALANCE NETWORK TESTS TO BE PERFORMED ON A SUBSCRIBER'S LINE. THE ON-HOOK TEST CONTINUES TO BE AVAILABLE FROM THE LTPMAN MAP LEVEL. THE OFF-HOOK TEST ALLOWS FOR A MORE ACCURATE TEST TO BE APPLIED TO THE SUBSCRIBER LOOP THAN THE ON-HOOK TEST AND WILL GENERALLY MAKE THE MORE ACCURATE SELECTION OF THE BEST NETWORK TERMINATION FOR THE LINE.

REFERENCE

NTP 297-2101-116 NTP 297-2101-516

Package	NTX054AA05 LINE TEST POSITION (LTP)
Feature set	MAINTENANCE AND TESTING
Feature	LTP - SEND FUNCTIONS(COIN & RINGING FUNCTIONS)
Feature no	F0636

DESCRIPTION

THE LTP COIN FEATURE ALLOWS A CRAFTSPERSON TO SEND THE 140 VOLT PULSE REQUIRED TO OPERATE THE COIN COLLECT OR COIN RETURN MECHANISM ON A PAY PHONE. THIS FEATURE IS TO BE USED IN CONJUNCTION WITH THE LTP MONITOR TALK FEATURE AND HAS A MENU COMMAND ON THE LTPLTA MAP LEVEL.

THE LTP RING FEATURE ALLOWS A CRAFTSPERSON TO RING A SUBSCRIBER'S LINE. THE RING FEATURE HAS BEEN DESIGNED IN CONJUNCTION WITH THE LTP MONITOR TALK FEATURE AND HAS A MENU APPEARANCE ON THE LTPLTA MAP LEVEL.

REFERENCE

NTP 297-2101-116 NTP 297-2101-516

Package	NTX054AA05 LINE TEST POSITION (LTP)
Feature set	MAINTENANCE AND TESTING
Feature	tone GENERATION
Feature no	F0637

DESCRIPTION

ALREADY COVERED UNDER THE TONE GENERATION PART OF THE LINE TRANS- MISSION TEST CAPABILITY OF LTP.

THE TRANSMISSION FREQUENCY CAN BE SPECIFIED:

4 HZ TO 3996 HZ IN 4 HZ STEPS. DEFAULT IS 1004 HZ.

REFERENCE

NTP 297-2101-516

Package	NTX054AA05 LINE TEST POSITION (LTP)
Feature set	MAINTENANCE AND TESTING
Feature	SW CONTROL OF CUT-OFF RELAY ON POSTED LINES
Feature no	F0638

DESCRIPTION

WHEN A LIE IS IN THE CONTROL POSITION A COMMAND IS AVAILABLE IN THE LNS SUBSYSTEM TO OPERATE THE CUT-OFF RELAY AND ISOLATE THE LINE CARD CIRCUITRY FROM THE LINE. AN INVENTORY OF LINES IN THE CUT-OFF STATE IS KEPT ALLOWING THE LINES IN THIS STATE TO BE QUE- RIED.

Package	NTX054AA05 LINE TEST POSITION (LTP)	
Feature set	MAINTENANCE AND TESTING	
Feature	LINE TRANSMISSION TESTS	INSERTION LOSS
Feature no	F0731	

DESCRIPTION

THE FOLLOWING TRANSMISSION TESTS CN BE DONE FROM THE LTP:

- A) LOSS: USED TO MEASURE THE INSERTION LOSS OF A TONE SENT FROM THE SUBSCRIBER END OF THE LINE TO THE LINE CARD IN THE CONTROL POSITION.
- B) NOISE: USED TO MEASURE THE C-MESSAGE WEIGHTED NOISE ON THE LINE SIDE OF THE LINE CARD IN THE CONTROL POSITION.
- C) MILLIWATT OR TONE GEN: USED TO SEND A TONE OUT ON THE LINE SIDE OF THE LINE CARD.
- D) QUIET TERMINATION: USED TO SEND A QUIET TERMINATION FOR NOISE MEASUREMENT FROM THE SUBSCRIBER END OF THE LINE.

Package	NTX054AA05 LINE TEST POSITION (LTP)		
Feature set	MAINTENANCE AND TESTING		
Feature	LINE TRANSMISSION TESTS	QUIET TERMINATION	
Feature no	F1116		

SEE FEATURE NUMBER F0731

Package	NTX054AA05 LINE TEST POSITION (LTP)		
Feature set	MAINTENANCE AND TESTING		
Feature	LINE TRANSMISSION TESTS	MILLIWATT	
Feature no	F1117		

SEE FEATURE NUMBER F0731

Package	NTX054AA05 LINE TEST POSITION (LTP)
Feature set	MAINTENANCE AND TESTING
Feature	AUTO RETEST OF ALT FEATURES
Feature no	F5429

FEATURE SYNOPSIS

This feature provides auto-retest of the ALT failures in both scheduled and non-scheduled ALT.

FEATURE DESCRIPTION

Auto retest of ALT failures for scheduled test:

With this feature, ALT will ignore the passed lines and repeat the test starting from the first failed line. Only when all the lines pass or when all the failing lines have been retested twice, will ALT retest from the first line of the set. In all cases, ALT will terminate the testing when the end time arrives.

Auto retest of ALT failures for non-scheduled test:

The current non-scheduled ALT will test each line in the posted set only once. With this feature, ALT will terminate the testing only when all the lines pass or when the failing lines have been retested twice. As in the scheduled ALT, the passed line will be ignored in the retest. The non-scheduled ALT differs from the scheduled ALT in that the non-scheduled ALT never retests the whole set of lines.

This feature is not optional and is a standard part of ALT in all offices with lines.

Reference

FDOC - BC0829

Package	NTX054AA05 LINE TEST POSITION (LTP)
Feature set	MAINTENANCE AND TESTING
Feature	RTP ROBUSTNESS
Feature no	F5830

FEATURE SYNOPSIS

This feature reorganizes the data structure of LTP and line maintenance to minimize the impact of ISDN and IVD.

NTX055AA03 Status: RTM TRUNK TEST POSITION (TTP)

MAINTENANCE AND TESTING	:	
STUCK SENDER FEATURE ON OUTGOING TRUNKS		F0137
MONITOR TALK		F0238
TTP- CALL TRANSFER (LOCAL)		F0642
TTP- SCHEDULED STATUS REPORT		F0643
TTP- TRUNK STATUS QUERY		F0644
TTP- 101XX CALL ROUTING		F0645
TALK OVER TRUNK UNDER TEST		F0851
LOADFW COMMAND FOR DOWNLOADING MTCE TEST UNIT(MTU)		F5402
TTP DETACHED USER		F7207

Package	NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set	MAINTENANCE AND TESTING
Feature	STUCK SENDER FEATURE ON OUTGOING TRUNKS
Feature no	F0137

DESCRIPTION

EACH TTP CAN REQUEST THAT ANY TRUNK GRUP BE MONITORED FOR STUCK SENDERS AND THAT IS BE VISUALLY NOTIFIED WHEN THIS PROBLEM OCCURS.

IF THE STUCK SENDER CONDITIN OCCURS THE TRUNK IS MADE SYSTEM BUSY AND PLACED IN A HOLD POSITION AT THE TTP FOR SCRUTING BY THE MAINENANCE PERSON. THE SYSTEM AUTOMATICALLY ATTEMPTS TO COMPLETE THE CALL OVER AN-OTHER TRUNK.

Package NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set MAINTENANCE AND TESTING
Feature MONITOR TALK
Feature no F0238

DESCRIPTION

THE MONITOR TALK FEATURE WILL PROVIDE A TWO WAY COMMUNICATIN ON A CALL PROCESSING BUSY CKT. IT WILL ALLOW TO TALK AND LISTEN TO BOTH PARTIES. THIS FEATUE IS INVOKED FROM THE TTP MONITOR LEVEL BY COMMAND 'MONTLK'. THE MONITOR CONNECTIN IS ESTABLISHED IMME- DIATELY IF THE POSTED CKT IS CALL PROCESSING BUSY. FROM THEN ON THE MONITOR CONNECTION FOLLOWS THE CALL PROCESSING CONNECTION, THAT IS WHEN THE CALL PROCESSIN CONNECTION GOES DOWN THE MONITOR CONNECTION IS RELEASED AND VICE VERSA.

Package	NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set	MAINTENANCE AND TESTING
Feature	TTP- CALL TRANSFER (LOCAL)
Feature no	F0642

DESCRIPTION

The TTP call transfer feature is provided at the MON level of TTP to allow a connection from the communication test line (5X30 trunk) to be transferred to the head set and to move the incoming trunk (call processing linked circuit) to the control position of TTP.

A typical use would be for a craftsman to access the communication test line of the DMS-100 office from another office by dialing a 7 digit telephone number (usually NXX 1005). After answering, the craftsman at the DMS-100 office would post the communication test line and invoke the TTP call transfer feature. This will idle the communication test line, move the incoming trunk into the TTP control position and connect the headset to the incoming trunk. This establishes a talking path via the headset.

All features of the TTP, including various transmission and maintenance tests can be applied to the incoming trunk.

The call transfer also enables the incoming trunk to be transferred to a jack ended trunk so that external test equipment can be applied.

Package NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set MAINTENANCE AND TESTING
Feature TTP- SCHEDULED STATUS REPORT
Feature no F0643

DESCRIPTION

THE DMS PROVIDES STATUS REPOTS ONCE PER DAY AT A TIME SET BY TEL- CO AND ON REQUEST. THE STATUS REPOT PROVIDES:

- 1) LIST OF ALL TRUNKS OUT OF SERVICE, THE LISTING WILL GROUP THE TRUNKS BY TYPE AND GROUP NUMBER.
- 2) EACH TRUNK ON THE LIST WILL HAVE AN INDICATION OF MACHINE MADE BUSY OR MAN-MADE BUSY.
- 3) THE REPOT WILL IDENTIFY ANY TRUNK GROUP THAT EXPERIENCED OVERFLOW TRAFFIC WHEN A TRUNK IN THE GROUP WAS MAINTENANCE BUSY.
- 4) THE REPORT WILL INDICATE ANY NETWORK MANAGEMENT CONTROLS IN EFFECT THAT WOULD EFFECT THE USAGE IN THE TRUNK GROUP.
- 5) A NIL REPOT SHOWING ALL TRUNK CIRCUITS ARE NORMAL.

Package	NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set	MAINTENANCE AND TESTING
Feature	TTP- 101XX CALL ROUTING
Feature no	F0645

DESCRIPTION

INCOMING DIRECTED 101 CALLS: INCOMING 101XX CALLS ARE ROUTED TO THE TTP IDENTIFIED BY THE 'XX' PORTION OF THE INCOMING NUMBER.

IF CALLED POSITION IS BUSY, INCOMING CALL WILL BE GIVEN GENERAL 101 CALL FEATURE.

Package	NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set	MAINTENANCE AND TESTING
Feature	TALK OVER TRUNK UNDER TEST
Feature no	F0851

DESCRIPTION

THIS FEATURE ENABLES A CRAFTSMAN TO ESTABLISH A TALKING PATH TO ANY TRUNK WHICH HAS BEEN POSTED FOR TESTING AT THE TTP.

Package	NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set	MAINTENANCE AND TESTING
Feature	LOADFW COMMAND FOR DOWNLOADING MTCE TEST UNIT(MTU)
Feature no	F5402

FEATURE SYNOPSIS

This feature provides CC software support required to download firmware for the new metallic test unit.

FEATURE DESCRIPTION

The Metallic Test Unit (MTU) is similar to the existing Line Test Unit (LTU) from the software point of view. One major difference is the firmware (8086 micro program) controlling the MTU is downloadable by the CC. Since a single physical MTU hardware performs the function of 2 logical MTUs, only the physical MTU has to be loaded.

This feature will provide the CC software support required to download the firmware to the MTU through a MTM. Since the RSM/RMM is not using the new pm loader, any MTU that is attached to a RSM/RMM currently cannot be downloadable using this feature at this moment.

This feature is in the process of evolution with enhancements provided in the near future.

Impact - H/W - Metallic test unit hardware is required.

Reference - FDOC - BC1259

Package	NTX055AA03 TRUNK TEST POSITION (TTP)
Feature set	MAINTENANCE AND TESTING
Feature	TTP DETACHED USER
Feature no	F7207

Synopsis

This feature enables a detached user to access the trunk test position (TTP).

The detached TTP can access most of the capabilities of the standard TTP and does not require dedicated hardware. The detached process goes into timeout after two hours or is terminated whenever the user logs out.

There can be up to 64 detached and login users in an office at any given time.

The detached user cannot access functions that require the use of dedicated hardware.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The following commands are not supported for a detached TTP user: TTA, MTX, HSET, JACK_, MONPOST, MONLINK, MONTALK_, CKTMON_, CALLTRF, STKSDR_, CPOS_ DELETE_TTP_, CREATE_TTP_.

Reference: FDOC AG1240

NTX055AB03 Status: RTM TTP-DIGIT VERIFICATION

MAINTENANCE AND TESTING	:	
CIRCUIT MONITOR		F0639
ADMINISTRATION	:	
(NSG) TRANS. VERIF. DMS-250 IMT. DAL & ONAL TRK GRPS TYPES		F1466
MAINTENANCE AND TESTING	:	
TRANSLATION VERIFICATION ENHANCEMENTS		F1492
TRANSLATION VERIFICATION - TRUNKS		F2223
ADMINISTRATION	:	
STS CONVERSION		F3433

Package	NTX055AB03 TTP-DIGIT VERIFICATION
Feature set	MAINTENANCE AND TESTING
Feature	CIRCUIT MONITOR
Feature no	F0639

DESCRIPTION -

circuit monitor (cktmon) is an optional feature of the monitor level of the ttp. it is used to examine the incoming messages from the trunk pm's (digital or analog) and in particular the digits received on an incoming trunk. when the feature is applied to the posted trunk, all the messages coming from the pm related to the trunk are intercepted, without interrupting the normal call processing, and displayed. in case of digit messages, the digits are also displayed up to 15 digits. any problem related to the received digits or the progress of the call will be indicated by the displayed message.

r0176 mmi describes how to invoke cktmon and the display it produces.

NTP AFFECTED - 297-1001-116

Trnslvf 1 to 15 digits ST³ 1 to 15 digits
The digits 0-9, are allowed.

³ST can be STP, ST2p, ST3p etc.

Output

If there is no posted circuit, the message

'NO CKT POSTED'

is displayed in the CI area and the execution of the command terminated.

a) Test-Line Codes

If the specified trunk group is not an outgoing or 2-way trunk, the message

'NOT OUTGOING OR 2-WAY TRUNK'

is displayed in the CI area.

If the test-line number is available, the message

'CALLED NUMBER TO BE OUTPULSED (2 TO 7 DIGITS)'

is displayed in the CI area; otherwise the message

'NO TL NUMBER'

is displayed.

b) Incoming Number

If the posted trunk is to an incoming or 2-way trunk, the message

'NOT INCOMING OR 2-WAY TRUNK'

is displayed in the CI area.

Translation information may be displayed for 3 types of routing:

1) Digit Translation Route

This routing displays up to 8 route selections presented in the order chosen by the call processing translation and routing procedures. The information displayed includes the common language

name of the chosen group, remaining digits to be outpulsed for the group (including the ST digit if any), and the group direction, if applicable.

If the routing is to a line, the work 'LINE' is displayed as the CLLI-NAME. The digit field in the case contains the line number.

The display has the form:

DIGIT TRANSLATION ROUTE

ROUTE	CLLI-NAME	DIGITS	ST	DIRECTION
1	16 chars	15 chars	4 chars	2 chars
2
.
.

(up to 7 alternates)

This display will usually be followed by case (2) for the route exhausted treatment. It may also be followed by a position route display, case (3).

³NB: Provision will be made for 2 stage outpulsing and ANI display.

2) Treatment Route Translation

In this case the display contains the treatment code and the routing via the common language name.

The display has the form:

TREATMENT ROUTE TRANSLATION, TREATMENT IS: (4 char code)

ROUTE	16 Chars
.	.
.	.
.	.

(Up to 7 alternates)

3) Position Route Translation

In this case the position and the routing via common language name are displayed.

The display is:

POSITION ROUTE TRANSLATION, POSITION IS: (position name)


```

ROUTE          16 Char CLLI 4 character
.              .      CAMA
.              .      TOPS
.              .      etc.

```

(Up to 7 alternates)

Finally, if the TRANSLATION VERIFICATON request fails error will be displayed in the CI area.

TRACE Feature

The translation verification feature also provides TRACE capability. This feature would be used when the TRANSLATION VERIFICATION output for a given number i.e. 613 596-1000 does not project the required routing in the office.

The TRACE feature will display all the translation data in the logical translation sequence implemented during call processing. Typical example of the TRACE feature is illustrated below:

```

TRANSVER      6135961234      TRACE
TABLE         TRK GRP
OTMF 1              613 -----
TABLE         HNPA CONT
613 -----
SUBTABLE      HNPA CODE
-
-
-
-
etc.

```

Note that the trace feature will highlight customer data missing from the translation tables but will not flag hard coded translations data.

Package NTX055AB03 TTP-DIGIT VERIFICATION
Feature set ADMINISTRATION
Feature STS CONVERSION
Feature no F3433

BACKGROUND**TRANSLATION PARTITIONS****General**

In general, translation partitions define a set of translation data for a telephony agent (line, trunk, or attendant console), which gives each agent a dialling plan to reach all accessible destinations. In effect, an agent's translation partition defines his 'view of the world'.

Local/Toll

In the Local/Toll environment, translation partitions are provided by Serving Numbering Plan Areas (SNPA's). Each agent (line or trunk) has an SNPA in its agent data. For lines, the SNPA is given indirectly by the line's Line Attributes Index (LineAttr), at the Table Control or Service Order level. Internally, the combination of SNPA and NXX (exchange code) are stored in the line's data as a Terminating Office Number (TOFCNO, 64 values, from 0 to 63).

Calls within the North American Numbering Plan are translated using Table HNPACONT, which is indexed by the originating agent's SNPA.

There are 16 SNPA's (numbered from 0 to 15), which are defined when tuples are added to Table HNPACONT (this applies to the first 16 tuples only). The external view of the SNPA is a three-digit code (e.g. 613, 514, etc.), which is mapped to the internal value.

DMS-250

DMS-250 is a common-carrier switch, and requires many more translation partitions than are provided by SNPA's, since it supports many private toll networks.

Translation partitions for DMS-250 are provided by Serving Translation Schemes (STS's). There are 1000 STS's (numbered from 0 to 999), of which the first sixteen are SNPA's. The STS's are also defined when tuples are added to Table HNPACONT, by mapping the external three-digit code (e.g. 001, 002) to the internal value.

To clarify this: the key for Table HNPACONT is a three-digit code which is mapped internally to an STS, from 0 to 999. The first 16 values are also mapped internally to an SNPA, from 0 to 15. Thus, all three-digit codes entered in Table HNPACONT become STS's. The first 16 also become SNPA's. There is an office parameter, MAXSTS in table OFCENG, which controls storage allocation for Table HNPACONT.

IBN/ESN/Scopedial

IBN DOD(Direct Outward Dial), ESN(Electronic Switched Network) or OUTWATS Translation uses a Line Attributes Index to obtain an SNPA, which defines the translation partition. Thus only 16 translation partitions are available for IBN. With multi-customer-group ESN, each customer group may have its own private ESN network, and thus require its own 'view of the world', i.e. its own STS. Although the maximum number of customer groups will soon exceed 1000, in practice 1000 STS's should be sufficient for the foreseeable future.

STS CONVERSION

The purpose of this feature is to convert IBN DOD/ESN/OUTWATS Translation to use STS's. The STS for an IBN agent will be given by the Line Attributes Index in its IBN Translation Table (IBNXLA).

National (HNPA) Translation and Routing have already been converted to use STS's for DMS-250 (Features C0457, C0459). The only conversions remaining to be done are of the Line Attributes Table, Local Call Area Screening, Class of Service Screening, and IBN Translation and Translation Verification (TRAVER), since DMS-250 does not use any of these.

The objectives of the conversion process are :

- * upward compatibility, as far as possible.
- * no data schema changes other than replacing SNPA with STS, i.e. no need for special procedures in dump/restore programs.
- * minimum effect on data store requirements for all offices, especially those using only 16 SNPA's.

LINE ATTRIBUTES TABLE AND LINE DATA

The SNPA field in the Line Attributes Table will become an STS. For details on the upward compatibility of this change, please refer to the Design Description (DD) section of this document. This change does not require any additional data store.

A Line Attributes Index containing an STS which is not an SNPA may not be used in line data, since the TOFCNO field will not be expanded. An explanatory message will be displayed if a user attempts to add a line with an unsuitable LineAttr.

The same restriction will apply to POTS VFG's in Table VIRTGRPS, which also use a LineAttr.

These LineAttrs may be used in Table IBNXLA, with the NET selector and subselectors DOD, ESN, or OWT to provide an STS for an IBN agent.

LOCAL CALL AREA SCREENING AND CLASS OF SERVICE SCREENING

Local Call Area (LCA) Screening and Class of Service (CSS) Screening both use an SNPA as the first part of the key in their respective control tables, LCASCRCN and CLSVSCRC. They will be converted to use an STS instead, with minimum effect on the data store requirements for offices using only the 16 SNPA's. The conversion method is described in detail in the Design Description (DD) section of this document.

The digit manipulation command FLD DDD, which uses Local Call Area Screening to convert numbers dialled in ESN format to DDD format, will also be converted to use STS's.

IBN TRANSLATION, RETRANSLATION AND TRANSLATION VERIFICATION (TRAVR)

IBN Translation and TRAVR use National (HNPA) Translation, which has already been converted to use STS's. Conversion requires only that the STS from the Line Attributes Table be used when invoking the National Translation procedures, and the above-mentioned conversion of LCA and CSS Screening.

IBN Retranslation (and Virtual Facility Groups (VFG's)) uses a customer group and NCOS to obtain a set of IBN translator names, which gives a LineAttr (and STS) for ESN, DOD, or OUTWATS. Thus, no conversion is required.

DEFINITION OF SNPA'S IN TABLE HNPACONT

The first 16 STS's in Table HNPACONT are the SNPA's. Only these values may be used in line data, POTS VFG data, PBX trunk data, and the DN, WRDN and THOUGRP tables. If more SNPA's are to be added after an office is initially datafilled, space must be reserved for them in Table HNPACONT by adding "dummy SNPA's". Any rearrangement of data in Table HNPACONT after an office is datafilled will have drastic effects on the above-mentioned tables, and also on the screening tables which use STS as the first part of the key.

An "SNPA Control Table" has been proposed as a remedy for this situation. This table would provide a means of designating any 16 STS's as SNPA's, regardless of their position in table HNPACONT. The SNPA Control Table would have to be datafilled before any of the affected tables could be datafilled. Any use of an SNPA in translation would have to be mapped through the SNPA Control Table to obtain the STS value, which would degrade real-time performance. This mapping would affect all POTS trans-

lation modules. Creation of a new table would also require special action in the dump/restore program.

For all of these reasons, design of an SNPA Control Table will not be included in this feature at this time.

NTX055AC02 Status: RTM TTP-TRANSMISSION MEASUREMENT

MAINTENANCE AND TESTING	:	
NOISE MEASUREMENT		F1125
DIGITAL PAD ADJUSTMENT		F1194
SINGING POINT TEST		F2200
ECHO RETURN LOSS (ERL) TEST		F2201

Package	NTX055AC02 TTP-TRANSMISSION MEASUREMENT
Feature set	MAINTENANCE AND TESTING
Feature	NOISE MEASUREMENT
Feature no	F1125

DESCRIPTION

This feature connects the trunk in the TTP control position to the noise measuring circuit (C - Message Weighting) and displays the measured noise (dBrn Co) on the VDU. This measurement is updated continuously.

Package	NTX055AC02 TTP-TRANSMISSION MEASUREMENT
Feature set	MAINTENANCE AND TESTING
Feature	DIGITAL PAD ADJUSTMENT
Feature no	F1194

DESCRIPTION

a) Purpose

This feature provides:

1. Display of digital and pad adjustment settings for a given circuit.
2. Means of setting digital receiver pads.
3. Means of setting digital transmit pads.
4. Means of changing pad adjustment for existing jack connection.

b) Description

This feature is provided as optional feature on the TTP. It provides a means of querying, changing or setting of digital pads on the analog trunks. The analog circuit have the receive and send digital pads. The digital circuit mounted on either TM to MTM has only the send digital pads. DCM channels do not have digital pads. The terms send (transmit) and receive are used in the telephony context, that is, send means transmission sent path to the distant office, and RECEIVE - TRNSM receive path from the distant office.

The digital pads are a feature of TM's that allow the receive and send levels to be adjusted dynamically. The send digital pads can be adjusted from 0 to -1.75 DB loss and the receive digital pads from 0 to +1.75 DB gain in 0.25 DB steps. The value to be input is to be in 1/4 DB increments in 1/100th of DB units. The pads can be changed at any time irregardless of the state the circuit is in. If a connection exists it does not effect it, but its new value will be taken into account for the next connection.

The preset pad adjustment value assigned can be changed temporarily for the existing connection set up on the TTP. In this case the posted circuit has to be a 'JACK' circuit and it is to be terminated to test equipment. The pads can be changed in the range of 0 to 6 DB in one DB steps.

c) Input

The digital pad request is invoked by a command from TTP at the TTP level. First the user must post the circuit and then invoke the command 'PADS' with parameters in optional basis. The results of the request are displayed on the screen.

The input comand format is as follows:

PAS <REQUEST> <NR> <SET>

where:

REQUEST = NONE - Display the digital pad setting and the pad adjustment for the circuit in TTP control position. No parameters required.

= R - Set digital receive pad. The next parameter required to indicate the value by which to change or set the pad.

= S - Set digital transmit pad. The next parameter required to indicate the value by which to change or set the pad.

= PA - Set pad adjustment for exsting connection.

NR = - Pad setting value. It is to be used as follows:

If request =

R - Digital receive pad value. The range is 0 to 175 for setting and for changing it is -175 to +175 (in 1/4 of DB steps in 1/100th of DB units). See parameter set.

S - Digital transmit pad value. The range is 0 to -175 for setting and for changing it is -175 to +175 (in 1/4 of DB steps in 1/100th of DB units). See parameter set.

PA - Pad adjustment value. The range is 0 to 6 in 1 DB steps.

SET = V/VALUE - This parameter is used to indicate whether the digital pads are to be set to the value indicated by 'NR' or to be changed by the amount indicted by the 'NR'. If 'SET' is not provided it indicates to change the existing setting by the amount in-

icated by the 'NR', otherwise set to the value indicated.

E.G.

To query digital pads input: PADS;
 To set digital receive pad to X.XX value input: PADS R XXX V;
 To change digital receive pad by X.XX value input: PADS R XXX;
 To set pad adjustment to X value, input: PADS PA X;

d) Displays

The various types of output messages that are generated are as follows:

1. Invalid input request. The messages are self explanatory to explain what the parameter should be and what values can be input.

2. General Type messages:

'No Circuit in Control Position'. There are no circuits in TTP control position. The request act on the circuit in TTP control position.

'Circuit is not a Trunk'. The circuit in TTP control position is not a trunk. Digital pads are only provided for analog trunk circuits and some digital circuits.

'Circuit without Device Name'. No device name for the circuit in TTP control position.

3. Message on Query.

'Digital Send Pad = X.XX DB'
 'Digital Recv Pad = -X.XX DB'

or

'No Digital Pads, Digital Circuit'
 'Pad Adjustment Value in DB = X'

or

'Pad Adjustment Value Invalid'

On the query command it indicates the digital pads and the pad adjustment set for the circuit in TTP control position if provided, otherwise the default message.

4. Message when digital pads set or changed.

'Digital Recv Pad Set at X.XX DB'

or

'No Digital Receive Pads, Digital Circuit'

'Digital Send Pad set at -X.XX DB'

or

'No Digital Send Pads, Digital Circuit'

5. Message on pad adjustment.

'Pad Adjustment Temp Changed as Indicated'

or

'Failed to Set', or

'Posted Circuit not a Jack', or

'Connection is not a TRNSM CONN', or

'No Connection Exist'.

The pad adjustment is set temporarily for the circuit in TTP control position. The posted circuit has to be a 'Jack' circuit and it has to be connected to test equipment, otherwise one of the fail messages is generated.

Package	NTX055AC02 TTP-TRANSMISSION MEASUREMENT
Feature set	MAINTENANCE AND TESTING
Feature	SINGING POINT TEST
Feature no	F2200

DESCRIPTION

On a request from the TTP manual level, Command LOSS E performs Singing Point test and Echo Return Loss and displays the results on the CRT screen for the circuit in the control position. Only a single test result is displayed.

A TTU has to be provisioned in the office for the above feature.

Package	NTX055AC02 TTP-TRANSMISSION MEASUREMENT
Feature set	MAINTENANCE AND TESTING
Feature	ECHO RETURN LOSS (ERL) TEST
Feature no	F2201

DESCRIPTION

On a request from the TTP manual level, command LOSS E performs Echo Return Loss and Singing Point test and displays the results on the CRT screen for the circuit in the Control Position. Only a single test result is displayed.

A TTU has to be provisioned in the office for the above feature.

Package NTX055BA01 RONI TRUNK TESTING
Feature set MAINTENANCE AND TESTING
Feature RONI TRUNK TESTING
Feature no F2431

FUNCTIONAL DESCRIPTION

FUNCTIONAL DESCRIPTION. -----

Manual maintenance on CAMA/RONI circuits is performed by accessing the monitor level of the MAP through the MAINTENANCE and TRUNKS subsystem levels. The circuit (CPOS) to be worked on is presented to the TTP by posting and bringing it into the control position.

One end of the talk (CPOS) circuit is connected to the headset associated with the ttp, and the other end is terminated to a cama/tops position.

The corresponding key circuit (CPOSKEY) is connected to a multi-frequency-receiver (MFR) set up for digit reception.

Once connections are established a signal identifying the call type as either an ONI or an ANI FAIL is sent to the connected cama/tops position. To the cama/tops position this call will not look any different from normal ONI or ANI FAIL call.

When the cama position operator answers, the maintenance person at the TTP informs the operator that this is a test call from maintenance. During the testing session signals will be sent back and forth. Any information detected by the system will be displayed on the ttp screen. The cama position operator will report back to maintenance over the communication channel, the response of the cama position to all signals received, by or sent from, the cama position.

The cama position operator receives the following requests from maintenance.

- (a) Request for attention to a call. Call types are distinguished by the tone type received and can be either an ONI call or an ANI FAIL call.
- (b) Request to key in a sequence of digits.
- (c) Request operation of 'reset' key.
- (d) Request to release the call (position disconnect).
- (e) Request to temporarily abandon position.

The maintenance person at the TTP, is capable of

- (i) Setting up a connection to a cama position

and sending the appropriate call identifying tone to the cama position

- (a) long period high tone for an ANI FAIL.
 - (b) Long period high tone double burst for ONI call
- (ii) Capable of distinguishing between a position disconnect and a position abandon.
 - (iii) Detect and display on the ttp screen digits received at the MFR.
 - (iv) Detect and display the state of the hardware on the cama position and signalling card.

When testing is finished the state of the circuit is returned its previous state.

DETAILED EXPLANATION

All tests on cama/roni circuits are manual tests performed from the monitor level of the ttp. The tester connects to an occupied cama/tops position and gives verbal instructions, via a headset monitor, to the operator.

The tester can monitor all actions of the operator and also confirm that communication between the dms and the cama/tops position is adequate.

Transmission tests are performed by connecting portable test equipment.

This feature allows a craftsperson to seize an outgoing cama circuit and send a call identifying tone to a cama/tops position. The circuit remains seized until released by the craftsperson.

Test calls may terminate on either a local cama position or a remote tops position. The cama/tops operator is not aware of a maintenance connection and treats the call as a normal ani fail or oni call.

Contact with a cama/tops position is established by sending a call identifying tone. A long tone high burst for an ani fail call and two tones short burst for an oni call. (CPOS_ANIF, CPOS_ONI).

A message is printed to inform the tester of the tone type sent to the cama/tops position. An offhook received from the cama position, and displayed on the ttp screen, confirms that a connection exists between the tester at the ttp and a cama/tops position.

The tester informs the position operator that this is a test call from maintenance to determine that the operators position

- (1) Can receive a call and distinguish between an ONI and an ANI fail call.

The tester may send consecutive ONI and ANI fail tones to the operators position and question the operator what call type he receives as each different tone is sent.

As each tone is sent the craftperson should constantly monitor the ttp screen to ensure that a connection is maintained. (An onhook is received from the cama/tops position if the connection is taken down).

- (2) The operator's key pad is in working order.

The tester instructs the operator to key in seven digits. The operator keys in seven digits. These are received at the multi frequency receiver(MFR) connected to the operators key pad by maintenance. A 'REORDER' request is sent to the operators position causing the reorder lamp to flash. The operator presses the 'RESET' key, causing the reorder lamp to stop flashing, and types in seven different digits.

The above sequence

- (a) Confirms correct operation of the key pad.
- (b) Transmission of digits, without corruption, between the MFR and the keypad. (Digits displayed on screen).
If the digits received were corrupted then a reorder request is sent automatically from the testers position.
- (c) Reorder lamp works and the operator can receive a reorder request. (Reorder sent message displayed on screen).
- (d) The reset key works allowing the operator to key in the same seven or seven more digits. (Operation of the reset key is detected and displayed on the screen).

The tester may ask the operator to press the position disconnect key. This is detected and a 'CPRLS' message is displayed on screen.

The tester may ask the operator to 'JACK OUT' then 'JACK IN'. A position abandon is detected when the operator jacks out and a 'POSAB' message is displayed. When the operator jacks back in a 'CPSZD' message is displayed.

At any time during the test period, after the command CPOS_CON and before the command CPOS_RLS, the tester may issue the command CPOS_HWS. This command reads the SC and SD points and returns the state of the hardware on the cama position signalling card. There are three relays on the cama position and signalling card. Relay OI when set sends an ONI tone. Relays OI and IF when set send an ANI FAIL tone and relay RV when set sends a REORDER tone. Other scan points examined are

- (a) If the outgoing cama trunk is seized.
- (b) If an operator is jacked in. This is only detected immediately after the command CPOS_CON and before either tone type has been sent to the operators position.
- (c) Finally a scan point indicating if the test relay is

operated is examined. This should never be set.

(If the testcall terminated on a tops position when a 'REORDER' request is sent the operation of relay RV cannot be detected because the duration of operation is only a few millisecond).

When the tester has finished testing then the command CPOS_RLS frees the outgoing cama circuit and its connected operators position.

If the test call terminates on a remote operators position certain restrictions exist. The tester should constantly monitor the signals received from the remote operators position. If an ONHOOK is received then the tester should release the connection and repeat the test.

With reference to the DMS 200 TOPS POSITION the tester has no control over the RONI trunk and the way TOPS software connects a tops position. Thus he is unable to detect and display the following

- (1) 'POSAB' - displayed when the operator jacks out during the test sequence. For a tops position tops software controls selection and connection of a position to roni trunk. If the operator abandons his position then the only indication that the craftsperson has is the display of the message 'CPRLS'. This tells him that the call has been released by the tops position. The release may be a position disconnect or a position abandon.

As soon as the operator jacks out an ONHOOK is detected and displayed on screen.(see sample session for further information).

- (3) 'JCKIN' - normally displayed when the operator jacks back in during a test call.

A check has been included to inform the tester of the number of outgoing cama circuits that are connected to cama positions waiting to handle a call. If fewer than three are in operation then the tester may continue at his own discretion.

PRELIMINARY REQUIREMENTS

Maintenance person at the TTP must ensure that at least one hold position is available, and the cpos circuit is in the control position.

NTX056AA04 Status: RTM ENHANCED ADMINISTRATION

DATA MODIFICATION SYSTEM	:		
DMO PRETESTING	-	TRUNK AND TRANSLATION	F0650
ADMINISTRATION	:		
SERVICE ORDER ECHOING OF DMO-S (CABLE PAIR)			F0653
DATA MODIFICATION SYSTEM	:		
BULK DMO			F0654
JOURNAL FILE			F0655
PENDING ORDER FILE		DUE DATE SPECIFICATION	F0656
PENDING ORDER FILE		REMINDER MESSAGE	F0657
PENDING ORDER FILE		RETRIEVAL BY SERVICE ORDER NO.	F0658
PENDING ORDER FILE		VALIDITY CHECKS	F0660
ADMINISTRATION	:		
OPTIONAL PARAMETER FOR DMOPRO TO SUPPRESS SUMMARY MESSAGE			F3945
DATA MODIFICATION SYSTEM	:		
JOURNAL FILE OPTION WITH DMOPRO			F5756
DATA DISTRIBUTOR			F6615

Package	NTX056AA04 ENHANCED ADMINISTRATION	
Feature set	DATA MODIFICATION SYSTEM	
Feature	DMO PRETESTING	- TRUNK AND TRANSLAT
Feature no	F0650	

DESCRIPTION

DMO pretesting is a feature which allows routing data to be validated and tested before being placed in service. While in the test state, queries may be issued against the test data but it will not be used for active call processing. The data may be activated at some user defined time and date.

The result of translating a particular set of digits is a pointer to route list composed (route reference #) of a set of routes which the router will select in the given order and attempt to terminate on. A route list is identified within a router table by a route reference number. A route can contain one of the following:

- Trunk Group
- Line
- Treatment
- Pointer to another Route List
- etc.

A new route list or a change from an existing route list is entered as an entirely new route list entry in the router table.

```
add 50 route 1
      route 2
      .
      .
      route n
```

This may be entered directly or through the pending order file. It is completely validated including existence of lines, trunk groups, etc. or can now be queried using the table editor. The route list is not accessible to any call processing at this time. If operational tests are to be performed on the routing data, a translator to result in the test route list. Translation testing which simulates the operation of translation and routing can then be applied to this special code to display the routing result including primary and all alternate routes.

Activation of a test route is done by simply changing the translation result for the desired called digits to select the test route. This DMO to activate the test route can of course be placed in a pending order file.

Package	NTX056AA04 ENHANCED ADMINISTRATION
Feature set	ADMINISTRATION
Feature	SERVICE ORDER ECHOING OF DMO-S (CABLE PAIR)
Feature no	F0653

DESCRIPTION

With this feature, service orders are 'echoed' back at both the input terminal and a remote teletype located at the MDF as they are being entered. In addition to the standard service order information, the DMS-100 system prompts for (and echoes) the cable number and cable pair number. The cable number and cable pair number are not stored within the DMS-100 database.

Package	NTX056AA04 ENHANCED ADMINISTRATION
Feature set	DATA MODIFICATION SYSTEM
Feature	BULK DMO
Feature no	F0654

DESCRIPTION

This feature permits the loading of data modifications into the machine from a non-interactive source such as a magnetic tape or file on some external device containing all of the DMO. The DMO may be loaded singly or in blocks into either the pending order file or directly into call processing data store. In addition, the DMS also has the capability to add up to 256 lines to a line hunting group and up to 2,048 trunks to a trunk group with a single DMO.

REFERENCE

NTP 297-1001-115

Package	NTX056AA04 ENHANCED ADMINISTRATION
Feature set	DATA MODIFICATION SYSTEM
Feature	JOURNAL FILE
Feature no	F0655

DESCRIPTION

The Journal file provides a facility to record activated Data Modification Orders (DMO) and Service Orders (SO) for back-up purposes in the event that the contents of data tables are inadvertently destroyed. If a switch failure occurs, a reload of the office is initiated and the Journal file is used to restore the data tables to their original state prior to the time of switch failure. A magnetic tape is presently used as the storage device of the Journal file.

REFERENCE

NTP 297-1001-127

Package	NTX056AA04 ENHANCED ADMINISTRATION		
Feature set	DATA MODIFICATION SYSTEM		
Feature	PENDING ORDER FILE	DUE DATE SPECIFICATI	
Feature no	F0656		

DESCRIPTION

This feature enables the Tel. Co. personnel to input and store Data Modification Orders (DMO's) that will be activated at a later date.

The DMO's will be stored in a PENDING subsystem. This subsystem can be accessed from the Command Interpreter (CI) mode by inputting PENDING.

The PENDING subsystem is divided into Pending Order Files (POF) where the Table Editor commands are stored for DMO's to alter data tables. Each POF contains the following data, a unique identifier for labelling, a due date at which the POF will be executed and a prompt period which provides the user with an automatic output of the POF any number of days prior to activation date.

The pending order file has the following capabilities:

a) POF may be queried/listed by:

1. due date
2. unique identifier

The identifier may be the service order number.

b) An automatic reminder message of pending POF identifiers is output at the prompt date and the due date (prompt period is the number of days prior to due date. Due date is the date at which POF should be executed).

c) POF are manually activated.

d) POF may be activated individually or collectively.

e) Each table editor command and its associated data that is entered into any POF is checked for validity. Full validity checks are also performed when POF are changed and at the time of activation of any POF.

f) The contents of any POF may be queried, changed or deleted.

REFERENCE

NTP 297-1001-126

Package	NTX056AA04 ENHANCED ADMINISTRATION		
Feature set	DATA MODIFICATION SYSTEM		
Feature	PENDING ORDER FILE	REMINDER MESSAGE	
Feature no	F0657		

SEE FEATURE NUMBER F0656

Package	NTX056AA04 ENHANCED ADMINISTRATION		
Feature set	DATA MODIFICATION SYSTEM		
Feature	PENDING ORDER FILE	RETRIEVAL BY SERVICE	
Feature no	F0658		

SEE FEATURE NUMBER F0656

Package NTX056AA04 ENHANCED ADMINISTRATION
Feature set DATA MODIFICATION SYSTEM
Feature PENDING ORDER FILE VALIDITY CHECKS
Feature no F0660

SEE FEATURE NUMBER F0656

Package	NTX056AA04 ENHANCED ADMINISTRATION
Feature set	ADMINISTRATION
Feature	OPTIONAL PARAMETER FOR DMOPRO TO SUPPRESS SUMMARY
Feature no	F3945

FEATURE SYNOPSIS

This feature provides an optional parameter QUIET to both DMOPRO and DMOVER to suppress these summary messages. This is particularly useful when doing a DMOPRO on files created by JFDUMP or JFPRINT from a Journal File. When processing such files, a considerable speed up can be achieved with the suppression of these summary messages.

FEATURE DESCRIPTION

An optional parameter QUIET is introduced to DMOPRO and DMOVER commands. This parameter will follow the existing RECORD option. The list of optional parameters will then be (RECORD option, QUIET option, START option, maximum number of errors before processing is aborted, output device, and output file name if an output device is specified). If the QUIET parameter is entered, a new quiet mode (which defaults to false) is turned on.

Every time DMOPRO or DMOVER finishes processing a table, it will check whether the QUIET mode is on. If it is, the summary messages on how many tuples in that table were changed, added and deleted will not be output. If quiet mode is not on, it will output the summary message as before.

The following is a list of all the parameters for DMOPRO and DMOVER:

- input file name
- RECORD options specifying whether to output the processed dmos or not
- QUIET option as described above
- START option to specify whether to start at the point where a previous attempt failed
- maximum number of errors before processing is aborted
- output device where the error messages and the record of dmo's process can be sent to
- output filename, if an output device has been specified, then a filename can also be optionally specified, the default filename is DMO\$FILE.

IMPACT

There is no limitation imposed on other features. When doing a bulk datafill on a lot of tables with DMOPRO, there will be time saving with the QUIET option. This is especially useful when doing a DMOPRO on files created by JFDUMP or JFPRINT from a Journal File which processes a large number of tables.

HARDWARE SPECIFICS

No hardware requirements.

FIRMWARE SPECIFICS

No firmware requirements.

RELATED FEATURES

This feature is not dependent on any other feature to function properly.

OPTIONALITY

The QUIET parameter introduced by this feature is optional. When the parameter is not entered by the user, the summary messages will still come out as before.

REFERENCE

FDOC BC1488 Optional Parameter for DMOPRO to Suppress Summary M

Package	NTX056AA04 ENHANCED ADMINISTRATION
Feature set	DATA MODIFICATION SYSTEM
Feature	JOURNAL FILE OPTION WITH DMOPRO
Feature no	F5756

FEATURE SYNOPSIS

This feature will add an optional parameter to the CIBINCOM to enable journal file additions.

FEATURE DESCRIPTION

The DMOPRO command is used to process a file of DMO (data modification orders). When a large number of changes are to be made to the tables it saves the user the trouble of entering all the updates individually.

This feature adds an option to the DMOPRO command. When it is used, this option causes the successful table changes to be recorded on the journal file. Previously the DMOPRO command would change the tables with no way for changes to be entered in the journal file.

Ref: FDOC BC1543

Package	NTX056AA04 ENHANCED ADMINISTRATION
Feature set	DATA MODIFICATION SYSTEM
Feature	DATA DISTRIBUTOR
Feature no	F6615

FEATURE SYNOPSIS

This activity consists of 2 parts:

1. A general data collection system. User software will bind in and provide a procedure and a list of tables. Whenever one of the tables in the list is modified the procedure will be passed a record of the change. The user process can then use the change record as it pleases.
2. Write a user which will bind into the above system and record changes to the lines tables on a file to be processed by the Station Administration feature of the Business Network Management system (BNM).

FEATURE DESCRIPTION

The Data Distributor provides a general means of monitoring changes to the DMS database. The collection of line data changes for BNM is a specific application of the data distributor. The line data will be used in the future to keep the BNM database in step with the DMS database

1. Data Collection System:

This system allows other software features to monitor changes to specified tables. Both old table control and new table control tables are supported. All changes to these tables: adds, deletes, changes and extensions are captured. The tables to be monitored are specified by the user system. If there are no user systems then no tables will be monitored.

The purpose is to allow downstream processes to monitor changes to specific tables in the DMS. If the data in the tables is also in another database accessed by the downstream process the data distributor can be used to keep the databases consistent. Data changes originated from the downstream process can be identified as such. Changes associated with a user will not be distributed to that user unless so desired.

This system is based on the Journal File (JF) system. If the JF system is not present then this system can not be either. If the JF package is present but the journal file is not active then this system will still be active. Only changes which would normally be written to the journal file are collected. For instance, if the bulk DMO Processor (DMOPRO) is used without the JOURNAL option the changes will not be collected.

2. Collection of Lines Data Changes:

This feature collects all the changes to the IBN and PSET lines tables. It uses the data collection system described above. As of BCS-24 the changes collected are discarded. In the future these changes will be processed by the BNM system to keep the database on the BNM system in step with the database on the DMS. Changes that originate from the BNM system are flagged and are not collected. This feature consists only of the DMS software used to record the data changes. The software on the BNM system to process the changes is in a future feature.

The tables monitored are:

- IBNLINES
- IBNFPEAT
- KSETINV
- IVDINV
- KSETLINE
- KSETFEAT
- SCUFEAT
- DPROFILE

Ref: DDOC AG0377

NTX057AB05 Status: RTM CUTOVER ASSISTANCE II (NON RESIDENT)

CUTOVER ASSISTANCE	:	
AUTOMATIC BOARD TO BOARD TEST -C1EAX		F0661
AUTOMATIC BOARD TO BOARD TEST -W.E. NO.1 SXS		F0664
AUTOMATIC BOARD TO BOARD TEST -NT SXS		F0665
AUTOMATIC BOARD TO BOARD TEST -A.E. SXS		F0666
AUTOMATIC BOARD TO BOARD TEST - S.C. XY		F0852
AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (DP)		F1119
AUTOMATIC BOARD TO BOARD TEST -#1 ESS		F1120
AUTOMATIC BOARD TO BOARD TEST - SP-1		F1121
AUTOMATIC BOARD TO BOARD TEST - AUTO TEL AND ELECTRIC CO.		F1291
AUTOMATIC BOARD TO BOARD TEST - SA-1		F1292
AUTOMATIC BOARD TO BOARD TESTING		F1307
AUTOMATIC BOARD TO BOARD TEST -NXID		F2170
AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (MF)		F2271
AUTOMATIC BOARD TO BOARD TEST -MOTOR SWITCH OFFICE		F2317
ABBT BEYOND METALLIC RANGE FOR RLM		F2376
ADMINISTRATION	:	
NEW PERIPHERAL POTS LINE BOARD TO BOARD TESTING		F3354

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST -C1EAX
Feature no	F0661

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST -W.E. NO.1 SXS
Feature no	F0664

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST -NT SXS
Feature no	F0665

DESCRIPTION

Board to board testing is carried out immediately prior to the cutover of the old switch to the DMS-100. At this stage, customer lines appear on both switches, service, however, is provided only by the old switch; call terminations are not provided by the DMS-100 because software data identifying the lines is in the cutoff state. Board to board testing checks that the translation tables in the DMS-100 and the cross-connections in the Distribution Frame (DF) of the DMS-100 match the existing connections in the old system.

Operation

When a test is initiated from an input terminal connected to the DMS-100 switch, the following sequence of events occurs under the software control of the DMS-100 switch.

- a) The DMS-100 selects the line associated with the designated Directory Number (DN) and connects the line to the ABBT test circuit through its Metallic Test Access (MTA) unit and the DF.
- b) The DN is outpulsed to the old switch by the outgoing trunk circuit (NT2X83), through the ABBT test circuit, an interface circuit to match the old office circuits, and a test access trunk to the line in the old switch. The interface circuits vary, depending on the type of old office.
- c) Tests are performed by activating relays in the ABBT through signal distribution points, and the results are obtained through scan points in the DMS-100 switch.
- d) The test results are printed out as required.

Tests Performed

The test arrangement is capable of checking for:

- a) proper assignment of line equipment in the DMS-100

- b) continuity of new lines
- c) absence of jumper reversals at the DF
- d) tip and ring affiliations of party lines (SXS only)
- e) loop-start and ground-start assignments in the DMS-100 line data tables (SXS only).

ABBT for RLM within Metallic Range

ABBT can also be performed where the old office is to be replaced by Remote Line Modules (RLM), which are controlled by a distant (host) DMS-100 new office via a Digital Carrier Module (DCM), and DS-1 carrier links. The ABBT equipment is located at the host site.

The maximum loop resistance between the host and the old office should not exceed 1500 ohms.

ABBT Test Limitations

The ABBT set does not support:

- Testing ordered by Line Equipment Number (LEN)
- A command to interrupt test execution
- Automatic retry of busy 100 groups.

Offices Supported

ABBT is performed by the NT5X73AA Automatic Board to Board Test Set, which is used where DMS-100 Family digital switches are installed to replace the following types of old switches:

SXS Switches:

NT SXS

Western Electric SXS

Stromberg-Carlson X-Y

A.E.Co SXS

Hitachi 1 E SXS

Tel. & Elec. Co. (Liverpool) SXS

}

}

}

} Using applique

} circuit NT5X79


```

Fed. Tel. & Radio SXS      }
U.S. Inst. Corp. Motorswitch }

```

Testing to these office follows the ABBT SXS test sequence, which include an Optimized pulsing option.

Optimized pulsing provides test speed-up when testing a range of DN, by dialing 1 digit to access the next line or 2 digits to access the next tens level.

Common Control Switches

```

WE & NT  #5 XBAR      }
WE       #1 ESS      } Applique circuit NT5X88
NT       SP-1        }
NT       SA-1        }
A.E.Co  #1 EAX      (applique circuit NT5X79)

```

Testing to these offices follows the ABBT XBAR test sequence, which allows for a predial delay used instead of handshaking sequence between seizure and outpulsing. The applique circuit NT5X88 is used to interface between some of these offices and the OG trunk NT2X83AA.

A.E.Co C1-EAX Switches

These offices use their own test sequence in the ABBT software.

North Electric NX1D Switches

These offices use their own test sequence in the ABBT software which includes a predial delay as for the common control switches.

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST -A.E. SXS
Feature no	F0666

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST - S.C. XY
Feature no	F0852

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (DP)
Feature no	F1119

SEE FEATURE NUMBER F0665

Package NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set CUTOVER ASSISTANCE
Feature AUTOMATIC BOARD TO BOARD TEST -#1 ESS
Feature no F1120

SEE FEATURE NUMBER F0665

Package NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set CUTOVER ASSISTANCE
Feature AUTOMATIC BOARD TO BOARD TEST - SP-1
Feature no F1121

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST - SA-1
Feature no	F1292

FEATURE SYNOPSIS

Automatic Board to Board testing to SA-1 office requires the incoming test trunk SD4168 to be present in the SA-1 office. On DMS side, the ABBT equipment requires applique circuit NT5X88. Standard ABBT equipment is used and the ABBT to SA-1 non-resident software is identical to that of #5 XBar. For more details, refer to F0665 and NTP 297-1001-522.

FEATURE DESCRIPTION

Package NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set CUTOVER ASSISTANCE
Feature AUTOMATIC BOARD TO BOARD TEST -NXID
Feature no F2170

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST -#5 XBAR (MF)
Feature no	F2271

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TEST -MOTOR SWITCH OFFICE
Feature no	F2317

SEE FEATURE NUMBER F0665

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	ABBT BEYOND METALLIC RANGE FOR RLM
Feature no	F2376

FEATURE SYNOPSIS

This feature extends the capability of automatic board to board testing to offices beyond metallic range of a DMS Host but colocated or within range of an RLM served by this Host.

FEATURE DESCRIPTION

Package	NTX057AB05 CUTOVER ASSISTANCE II (NON RESIDENT)
Feature set	ADMINISTRATION
Feature	NEW PERIPHERAL POTS LINE BOARD TO BOARD TESTING
Feature no	F3354

FEATURE DESCRIPTION

This makes board-to-board testing work for pots (plain ordinary telephone service) lines on LCM's. The tests still will not work for P-phones or Data Units, they will be skipped and a message will be printed.

Package	NTX057BA01 CUTOVER ASSISTANCE III (NON RESIDENT)
Feature set	CUTOVER ASSISTANCE
Feature	AUTOMATIC BOARD TO BOARD TESTING SPEED-UP
Feature no	F2510

GENERAL DESCRIPTION

Feature R0510 implements a speed_up strategy for board to board testing, as well as some improvements to the customer interface of the ABBT program.

The current ABBT testing is of an average 18 seconds per line, or 42 hours per 10,000 lines. The required objective is to test 10,000 lines within 1 shift (8 hours) instead. No hardware change is presented to realize this feature, and the only way right now to achieve the objective will be to make ABBT a multi_process (having several ABBTs).

This document will explain first the various improvements proposed, and then the speed_up strategy.

GENERAL IMPROVEMENTS

- 1) CLLIs will be created for ABBT's outpulsing trunk :
'BBTOUT' for outpulsing trunk NT2X83 will be put into TRKMEM. In addition, the SC and SD drivers associated with the ABBT set will be put into the SCGRP and SDGRP tables.

This means that those circuits can now be posted on the TTP level of the map and respond to normal commands (RTS, BSY, etc.).

If, at any moment during board to board, the message 'UNEXPECTED OUTPUTSING RESULT MSG' occurs, these circuits should be posted, tested, and rtsed.

- 2) The outgoing outpulsing trunk, 'BBTOUT', will have entries in tables TRKGRP and TRKSGRP as a trunk of group type 'TO' and of direction 'OG' (outgoing), and in table TRKMEM. The circuit location will be given at MMI time, as for the SC and SD drivers.

This means that initial seize time (PSPDSEIZ) and inter_digit time (PARTDIAL) can now be user controlled, avoiding unnecessary time losses waiting for digits.

- 3) The CI interface for the ABBT MMI will be modified to allow multi_bbt_sets input, and will be a little more user friendly. Please see MMI section for more details.

SPEEDUP STRATEGY

The speed_up strategy, main purpose of this feature, is divided in 3 separate parts :

- 1) purely internal software changes, which have no external effects and are independent of the old office's structure.
- 2) an internal reordering of user's DN input by LEN, so that testing order will be by LEN. This is good for certain offices only
- 3) making ABBT a multi_board/process program. This requires 2 to 4 ABBT sets and associated hardware, and can apply only to offices which can dedicate several incoming no_test trunks during ABBT.

NTX057DA01 Status: A+M CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX

CUTOVER ASSISTANCE	:	
CUTOVER OF WORKING T1 LINES USING NAILED UP CONNECTIONS		F0667
SOFTWARE CONTROLLED CUTOVER OF LINES		F0668
DTC CUTOVER FEATURE		F2573
ADMINISTRATION	:	
NEW PERIPHERAL POTS LINE CUTOVER SUPPORT		F3351

Package	NTX057DA01 CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX057AC)
Feature set	CUTOVER ASSISTANCE
Feature	CUTOVER OF WORKING T1 LINES USING NAILED UP CONNEC
Feature no	F0667

DESCRIPTION

The purpose of this feature is to cutover without any service interruptions working T1 lines from channel banks to the DMS-100 switch.

For this purpose, a nailed up connection is established through 2 DCM, DS-1 ports (either the same or different DCM's) prior to any signal transfer via a MAP command.

A cutover switch is activated which bridges-in the DMS-100 DCM ports in tandem between the near-end and far-end channel banks.

The activation of the cutover switch will cause a shippage and reframing of the digital bit streams at the channel banks but will not cause service disruption.

Time slots on that bit stream can be posted and service busied at the TTP and all the required transmission parameters tested.

The T1 line facility can be activated with the DMS-100 by entering the proper DMO.

Permanent cabling and removal of the cutover switch will be done subsequently.

If the T1 facility to be cutover carries services requiring A&B signalling bit discrimination, then services will have to be assumed by other facilities prior to the cutover.

Loop timing will be required for the far-end channel bank which will be permanently ??? with the DMS-100 switch.

Package	NTX057DA01 CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX057AC)
Feature set	CUTOVER ASSISTANCE
Feature	SOFTWARE CONTROLLED CUTOVER OF LINES
Feature no	F0668

DESCRIPTION

The software cutover feature is a non-resident program function used as an aid to hardware cutover. It allows the controlled operation and release of cutoff relays on the line card. The cutoff relay isolated the line card circuitry from the line. The line cutoff relay has a hold line which can be grounded via a common cutover circuit in each line drawer. This hold circuit can either be a jumper on the line drawer connector or a hold relay located in the line drawer.

When a command is made to operate the cutoff relay on a line card, the cutoff relay will be held over the hold line, and the operate path can be released.

At cutover time the hold relay in each line drawer is released, allowing all the line cutoff relays in the drawer to release, connecting the lines to the line cards.

The use of the jumper for the line drawer hold line is recommended for an extended period of cutoff, both to reduce power consumption and to ensure cutoff is maintained in the event of certain line module faults. Just before cutover the relay hold path would be operated and the jumper removed, allowing a controlled software cutover.

Package	NTX057DA01 CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX057AC)
Feature set	CUTOVER ASSISTANCE
Feature	DTC CUTOVER FEATURE
Feature no	F2573

FEATURE SYNOPSIS

This feature allows the pre-cutover transmission testing of DS-1 lines on a DTC. This feature is required for DMS/DTC replacement of analog switches serving DS-1 facilities. The feature allows channel by channel testing of DS-1 spans.

Package	NTX057DA01 CUTOVER ASSISTANCE IV (NRES)(UPG. OF NTX057AC)
Feature set	ADMINISTRATION
Feature	NEW PERIPHERAL POTS LINE CUTOVER SUPPORT
Feature no	F3351

FUNCTIONAL DESCRIPTION

This change to the module LMCUT will make cutover possible for LCM's as well as LM's. Currently, a pots line (plain ordinary telephone service) can only be cutover if it is on a LM, but with this change a pots line on either a LCM or a LM can be cutover.

P-phone and Data Unit line cards will not be cut off. They will simply be skipped at this time.

A physical drawer on a LM refers to 32 lines but the LCM's physical drawer is 64 lines. Because the holding current is supplied on a physical drawer basis on LCM's, all commands referring to a drawer on a LCM will apply to all 64 lines.

NTX057EA01 Status: RTM CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX

CUTOVER ASSISTANCE	:	
CUTOVER OF WORKING T1 LINES USING NAILED UP CONNECTIONS		F0667
SOFTWARE CONTROLLED CUTOVER OF LINES		F0668
LM CUTOVER BY DN		F2542
DTC CUTOVER FEATURE		F2573
ADMINISTRATION	:	
NEW PERIPHERAL POTS LINE CUTOVER SUPPORT		F3351

Package	NTX057EA01 CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX057DA)
Feature set	CUTOVER ASSISTANCE
Feature	CUTOVER OF WORKING T1 LINES USING NAILED UP CONNec
Feature no	F0667

DESCRIPTION

The purpose of this feature is to cutover without any service interruptions working T1 lines from channel banks to the DMS-100 switch.

For this purpose, a nailed up connection is established through 2 DCM, DS-1 ports (either the same or different DCM's) prior to any signal transfer via a MAP command.

A cutover switch is activated which bridges-in the DMS-100 DCM ports in tandem between the near-end and far-end channel banks.

The activation of the cutover switch will cause a shippage and reframing of the digital bit streams at the channel banks but will not cause service disruption.

Time slots on that bit stream can be posted and service busied at the TTP and all the required transmission parameters tested.

The T1 line facility can be activated with the DMS-100 by entering the proper DMO.

Permanent cabling and removal of the cutover switch will be done subsequently.

If the T1 facility to be cutover carries services requiring A&B signalling bit discrimination, then services will have to be assumed by other facilities prior to the cutover.

Loop timing will be required for the far-end channel bank which will be permanently ??? with the DMS-100 switch.

Package	NTX057EA01 CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX057DA)
Feature set	CUTOVER ASSISTANCE
Feature	SOFTWARE CONTROLLED CUTOVER OF LINES
Feature no	F0668

DESCRIPTION

The software cutover feature is a non-resident program function used as an aid to hardware cutover. It allows the controlled operation and release of cutoff relays on the line card. The cutoff relay isolated the line card circuitry from the line. The line cutoff relay has a hold line which can be grounded via a common cutover circuit in each line drawer. This hold circuit can either be a jumper on the line drawer connector or a hold relay located in the line drawer.

When a command is made to operate the cutoff relay on a line card, the cutoff relay will be held over the hold line, and the operate path can be released.

At cutover time the hold relay in each line drawer is released, allowing all the line cutoff relays in the drawer to release, connecting the lines to the line cards.

The use of the jumper for the line drawer hold line is recommended for an extended period of cutoff, both to reduce power consumption and to ensure cutoff is maintained in the event of certain line module faults. Just before cutover the relay hold path would be operated and the jumper removed, allowing a controlled software cutover.

Package	NTX057EA01 CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX057DA)
Feature set	CUTOVER ASSISTANCE
Feature	LM CUTOVER BY DN
Feature no	F2542

Synopsis

This feature improves the transfer of in-service lines from an existing switch to a new DMS. It allows cut-over of lines in the Line Concentrating Module (LCM) by Directory Number (DN) as well as by Line Equipment Number (LEN) or line drawer. This permits easy expansion of DMS-100 line equipment by providing line drawers with unassigned line cards and double connecting the new line appearance with the old line appearance on an existing switch.

This feature also provides progress message recording of LMCUT command execution.

Implementation

In order to transfer in-service lines to a new switch, the CO relays are released, then command LMCUT is used to enter the LMCUT environment. New command CUTMODE in the LMCUT environment sets cutover mode to DN or LEN. Response is one of: LEN, DN, QUERY.

The existing LEN commands that can be used in DN mode are: are:

- * OPRTCO, which operates the CO relay for a LEN
- * RLSCO, which releases the CO relay for a LEN
- * NOBTST, which verifies that the CO relay is operated for a LEN

The new DN commands are:

- * DNNOBTST, which verifies that the CO relay is operated for a single DN or a range of DNs
- * DNCUTOFF, which operates the CO relay for a single DN or a range of DNs
- * DNCUTOVER, which releases the CO relay for a single relay or a range of DNs
- * QUIT, which quits out of LMCUT

The following cutover by LEN commands are modified to record all progress messages in the progress file: OPRTHOLD, RLSHOLD, CUTOVER, OPRTCO, RLSCO, NOBTST, QHOLD, CUTOFF.

The DELAY command is deleted.

New command CUTREPORT provides recording of progress messages. Respond to ACTION with one of: DEFINE, START, STOP, CLEAR, or QUERY.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX057BA Cutover Assistance

Activation and Deactivation

This is a non-resident program, and must be loaded from tape.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Do not run Automatic Line Testing (ALT) or LCO command at LTP level of the MAP while LMCUT by DN is in progress.

Cutover by DN commands are valid on LCMs only.

The number of CO relays that can be operated at the same time in one physical drawer on an LCM is limited by the current consumed. The minimum, assuming 6X17AA line cards, is thirty-two.

The number of CO relays that can be operated at the same time on one LCM is limited by the current consumed. The minimum, assuming 6X17AA line cards and eight hundred call seconds of traffic, is 125.

Reference: FDOC AF0017

Package	NTX057EA01 CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX057DA)
Feature set	CUTOVER ASSISTANCE
Feature	DTC CUTOVER FEATURE
Feature no	F2573

FEATURE SYNOPSIS

This feature allows the pre-cutover transmission testing of DS-1 lines on a DTC. This feature is required for DMS/DTC replacement of analog switches serving DS-1 facilities. The feature allows channel by channel testing of DS-1 spans.

Package	NTX057EA01 CUTOVER ASSISTANCE IV(NRES) (UPG. OF NTX057DA)
Feature set	ADMINISTRATION
Feature	NEW PERIPHERAL POTS LINE CUTOVER SUPPORT
Feature no	F3351

FUNCTIONAL DESCRIPTION

This change to the module LMCUT will make cutover possible for LCM's as well as LM's. Currently, a pots line (plain ordinary telephone service) can only be cutover if it is on a LM, but with this change a pots line on either a LCM or a LM can be cutover.

P-phone and Data Unit line cards will not be cut off. They will simply be skipped at this time.

A physical drawer on a LM refers to 32 lines but the LCM's physical drawer is 64 lines. Because the holding current is supplied on a physical drawer basis on LCM's, all commands referring to a drawer on a LCM will apply to all 64 lines.

NTX059AB04 Status: RTM POLLING OM & AUT.MSG ACCTG.DATA VIA DATA

ADMINISTRATION	:		
POLLING AMA DATA		VIA DATAPAC - MANUAL	F0670
AUTOMATIC POLLING OM DATA		VIA DATAPAC	F1065
POLLING AMA DATA		VIA DATAPAC - AUTOMATIC	F1066
DATAPAC POLLING AND RESTRUCTURE			F5437
XFER SIMULTANEOUS POLLING			F5745

Package	NTX059AB04 POLLING OM & AUT.MSG ACCTG.DATA VIA DATAPAC(UPG		OF
Feature set	ADMINISTRATION		
Feature	POLLING AMA DATA	VIA DATAPAC - MANUAL	
Feature no	F0670		

DESCRIPTION

CURRENTLY, OM AND AMA TAPES THAT ARE READY FOR DOWNSTREAM PROCESSING MUST BE PHYSICALLY DISMOUNTED FROM THE SWITCH AND TRANSPORTED TO THE DATA PROCESSING CENTRE. THIS PROCEDURE CAN BE TIME CONSUMING, EXPENSIVE AND SUBJECT TO HUMAN ERROR.

WITH THIS FEATURE INSTALLED, IT WILL PERMIT A MICRO OR MINI-COMPUTER TO AUTOMATICALLY DIAL OVER THE DDD OR DATA NETWORK, SEVERAL DMS SWITCHES AND EXTRACTING OM/AMA DATA FROM THEIR DISK OR TAPE FILE. THIS DATA WILL BE STORED ON THE APP'S DISK FILES IN INDUSTRY STANDARD FORMAT.

IT ALSO PROVIDED COMMUNICATION S/W ALLOWING INTERFACING TO A VARIETY OF LARGE HOST COMPUTERS VIA SYNCHRONOUS PROTOCOL AT SPEED UP TO 9.6 KB/S. THE DATA TRANSFER FEATURE CONSISTS OF FOUR LEVELS OF PROCESSING, I.E. THE ELECTRICAL INTERFACE. THE LINK PROTOCOL HIGH-LEVEL DATA LINK CONTROL, THE DATAPAC AND THE APPLICATION.

WITH THIS FEATURE, COMMUNICATING IS ALWAYS INITIATED DOWNSTREAM VIA DATAPAC BY PLACING A VIRTUAL CALL REQUEST TO THE DMS MODE. THE DMS WILL VERIFY THE CALLER'S IDENTITY BY COMPARING AGAINST AN INTERNAL TABLE OF VALID DATAPAC NUMBERS AND IF VALID WILL RESPOND WITH A CALL ACCEPT PACKET. THIS IS A FEATURE INCORPORATED WITH POLLING OF AMA, OM DATA OF DOWNSTREAM COMPUTER FACILITY. WHEN THE REQUIRED FILE MANIPULATION SEQUENCE IS COMPLETED, THE ACTUAL DATA TRANSMISSION BEGINS, BLOCKS OF DATA ARE READ SEQUENTIALLY FROM THE DEVICE AND TRANSMITTED TO THE HOST COMPUTER. WHEN THE LAST BLOCK HAS BEEN TRANSMITTED, A BLOCK COUNT IS SENT DOWNSTREAM TO BE USED AS AN OVERALL CHECK OF THE NUMBER OF DATA BLOCKS RECEIVED.

Package	NTX059AB04 POLLING OM & AUT.MSG ACCTG.DATA VIA DATAPAC(UPG OF		
Feature set	ADMINISTRATION		
Feature	AUTOMATIC POLLING OM DATA	VIA DATAPAC	
Feature no	F1065		

DESCRIPTION

Currently OM tapes that are ready for downstream processing must be physically dismounted from the switch and transported to the DATA PROCESSING CENTRE. This procedure can be time consuming, expensive and subject to human error.

With this feature installed, it will permit a micro or mini-computer to automatically dial over the DATAPAC network, several DMS switches and extracting OM data from their disk or tape file. This data will be stored on disk files in industry standard format.

Currently, two methods are available:

a) Manual Method

In manual method, the Telco's downstream computer always originates the request for data. The DMS uses a list of valid calling addresses to ensure that the information is sent only to those authorized to receive it.

In normal operation the OM/AMA tapes are demounted from their drives and placed in a local tape library/rack, rather than being sent out. The operator then informs the DMS through the table editor, that 1 or more tapes are ready for transmission.

Later on that day (or whatever the telco has decided on), the downstream computer automatically generates a call to the DMS requesting a list of available tapes and associated information (block counts, etc.). It then requests the specific tape to be transmitted. At the DMS a minor alarm is raised, to indicate to the telco staff that a tape is required for mounting. The operator determines which tape by looking at the 'EXT' alarm log. He then mounts the correct tape, and informs DMS which drive it is on. The system verifies the label information, and if all goes well the tape is transmitted.

This feature can handle most of the errors possible on the Datapac network. The usual result of this type of error would be that the Telco data center would rerequest the same tape from a certain block number down the tape. This saves time in not having to retransmit the entire file.

After the transmission phase is completed, the downstream computer then informs the DMS package of the final disposition of the tape. (Such as send to data center for comparison, return to tape rotation, etc.)

In some cases, there may be formatting errors on the tape, which the DMS cannot handle. In these cases it is recommended that the afflicted tape be shipped to the data center. This, however, does not occur too often.

b) Automatic Method

The automatic OM/AMA data transferral feature is an extension of the manual capability by eliminating manual intervention and the handling of the recording media during normal operating conditions. The initial implementation will rely on packet-switching network with CCITT - X.25 interface as the transmission vehicle. This is to say that this automatic feature is presently intended for switches which have access to data network with X.25 compatible protocol. The automatic feature will operate in a passive mode when polled or interrogated by the downstream data processing centre. The communication between DMS and the downstream processor will be in the machine-to-machine mode. DMS will facilitate the transmission of requested data in recognition of pre-programmed commands in the application protocol when initiated from the downstream processor. Security will be provided to prevent illegal access of data and means will be provided for retransmission of corrupted data.

Storage Capacity

Due to the nature of AMA data, storage sufficient for three days of recording will be provided in case of inability to transmit data to the processing centre due to hardware or facility failures. The worst case daily storage requirement is based on the following assumptions:

- i) 60,000 trunk TOLL/TOPS office
- ii) 10^4 incoming CAMA trunks (6,000 trunks)
- iii) 7^4 incoming TOPS/TSPS trunks (4,200 trunks)
- iv) 30 CCS on each trunk during busy hour
- v) 150 second holding time for each call
- vi) equivalent traffic per trunk per day is equal to 10 busy hour traffic
- vii) Each AMA recording requires 22 Bytes
- viii) weighted average of TOPS call requires 40 Bytes

With such an office, the total volume of AMA data generated in one day is about 60 M Bytes.

In the case of OM data, storage capacity for three days with daily volume of up to 3 M Bytes should be provided.

An average large TOLL office would presently require daily storage of about 5 M Bytes for AMA. For reasons of economic expansion, this feature should support storage expansion of up to 60 M Bytes in 5 M Byte steps.

Transmission Facility

Data network will be used for the transmission of OM/AMA data to the processing centre. The present interface will support synchronous transmission of up to 9.6 K bit per sec. using CCITT X.25 protocol. The electrical interface will conform to CCITT X.21 bits. As a minimum requirement, the system will provide at least two independent X.25 across lines on each switch. Each interface can be used for parallel polling of different data files and also acts as security back up for the remaining interface(s).

File Organization

The data files will be logically organized to facilitate polling from the processing centre. In addition to the logical grouping of data, such as data generated on daily basis, etc., each logical file will not exceed a preset value of, say, 1 M Bytes long. This restriction will result in a reasonable maximum transmission time for each file. This also ensures that switches generating a high volume of OM/AMA data will have the data organized in more than one file such that parallel polling of different files using multiple access option will provide the capability to minimize elapsed polling time if deemed desirable.

Data Security

Due to the nature of AMA data, the system will provide the option to record and store billing information on more than one physical device. The security arrangement is provided by a primary recording system and an optional secondary recording system. Physical devices within a system must be of the same type but different storage media can be used for the primary and the secondary system. The primary system is used for polling and the secondary system is used only for back up purposes. If disk capability is available for AMA recording, it is logical to assume that disk will be the primary system because of economical and technical considerations.

Up to three days of turn around time is allowed for the downstream polling and data validation process. Therefore, storage space equiv-

alent to four days of expected daily data volume should be provided. Due to the preferred data structure of single file per tape, it becomes necessary to store daily AMA data on different tape units in a primary tape system. The three days data storage requirement also implies a minimum of five tape units in the primary tape system including one standby.

The secondary system will be a continuous single file data structure physically spread out on as much storage space as designated for this purpose. In order to provide instant transfer between tape units without loss of data, a minimum of two tape secondary system is recommended. DMS will rotate the recording on the two or more units when the tape on the active unit is exhausted.

Capability will be provided to manually initiate the transfer of data from disk to any available tape unit in an office. This is to ensure that the data can be physically transported using tape when the polling capability is unavailable for an extended period in an all disk recording configuration. The reverse capability of reinstating a disk will also be provided.

Due to the nature of OM data and the relative low data volume requirement, security system will not be explicitly provided to the same extent as AMA. A single device is expected to be used for continuous recording of OM until the file is requested to be closed for polling. The file and the device are expected to be released immediately after the polling session for subsequent recording. The polling is expected to take place daily and between the scheduled OM dump from DMS.

Application Protocol

The protocol is intended to be simple for implementation and designed as a machine-to-machine protocol. The protocol will consist of the following basic steps.

- 1) Call request from data processing centre to DMS.
- 2) Validation of the origin of the polling request by checking the originator identification in the data network protocol.
- 3) Data processing centre will then indicate either OM or AMA data is required.
- 4) DMS will respond by sending the identification and status of data file(s) available for polling or being polled by different users.
- 5) Data processing centre will then request data from a specific file with an offset from the beginning of the requested data file and the number of records to be transmitted from the file. This ca-

pability is provided to facilitate efficient retransmission of corrupted data blocks.

- 6) Step (5) can be repeated for as long as there is data to be polled or retransmitted.
- 7) Close of call will be initiated by the downstream processing centre at the end of the session.

Previously polled data files should be released by the processing centre using explicit commands as soon as the data validation process is completed by making a call request to DMS or before closing a call at the end of a polling session.

Package	NTX059AB04 POLLING OM & AUT.MSG ACCTG.DATA VIA DATAPAC(UPG OF		
Feature set	ADMINISTRATION		
Feature	POLLING AMA DATA	VIA DATAPAC - AUTOMA	
Feature no	F1066		

DESCRIPTION

Currently, OM and AMA tapes that are ready for downstream processing must be physically dismounted from the switch and transported to the DATA PROCESSING CENTRE. This procedure can be time consuming, expensive and subject to human error.

With this feature installed, it will permit a micro or mini-computer to automatically dial over the DATAPAC network, several DMS switches and extracting OM/AMA data from their disk or tape file. This data will be stored on disk files in industry standard format.

Currently, two methods are available:

a) Manual Method

In manual method, the Telco's downstream computer always originates the request for data. The DMS uses a list of valid calling addresses to ensure that the information is sent only to those authorized to receive it.

In normal operation the OM/AMA tapes are demounted from their drives and placed in a local tape library/rack, rather than being sent out. The operator then informs the DMS through the table editor, that 1 or more tapes are ready for transmission.

Later on that day (or whatever the telco has decided on), the downstream computer automatically generates a call to the DMS requesting a list of available tapes and associated information (block counts, etc.). It then requests the specific tape to be transmitted. At the DMS a minor alarm is raised, to indicate to the telco staff that a tape is required for mounting. The operator determines which tape by looking at the 'EXT' alarm log. He then mounts the correct tape, and informs DMS which drive it is on. The system verifies the label information, and if all goes well the tape is transmitted.

This feature can handle most of the errors possible on the Datapac network. The usual result of this type of error would be that the Telco data center would rerequest the same tape from a certain block number down the tape. This saves time in not having to retransmit the entire file.

After the transmission phase is completed, the downstream computer then informs the DMS package of the final disposition of the tape. (Such as send to data center for comparison, return to tape rotation, etc.)

In some cases, there may be formatting errors on the tape, which the DMS cannot handle. In these cases it is recommended that the afflicted tape be shipped to the data center. This, however, does not occur too often.

b) Automatic Method

The automatic OM/AMA data transferral feature is an extension of the manual capability by eliminating manual intervention and the handling of the recording media during normal operating conditions. The initial implementation will rely on packet-switching network with CCITT - X.25 interface as the transmission vehicle. This is to say that this automatic feature is presently intended for switches which have access to data network with X.25 compatible protocol. The automatic feature will operate in a passive mode when polled or interrogated by the downstream data processing centre. The communication between DMS and the downstream processor will be in the machine-to-machine mode. DMS will facilitate the transmission of requested data in recognition of pre-programmed commands in the application protocol when initiated from the downstream processor. Security will be provided to prevent illegal access of data and means will be provided for retransmission of corrupted data.

Storage Capacity

Due to the nature of AMA data, storage sufficient for three days of recording will be provided in case of inability to transmit data to the processing centre due to hardware or facility failures. The worst case daily storage requirement is based on the following assumptions:

- i) 60,000 trunk TOLL/TOPS office
- ii) 10^4 incoming CAMA trunks (6,000 trunks)
- iii) 7^4 incoming TOPS/TSPS trunks (4,200 trunks)
- iv) 30 CCS on each trunk during busy hour
- v) 150 second holding time for each call
- vi) equivalent traffic per trunk per day is equal to 10 busy hour traffic
- vii) Each AMA recording requires 22 Bytes
- viii) weighted average of TOPS call requires 40 Bytes

With such an office, the total volume of AMA data generated in one day is about 60 M Bytes.

In the case of OM data, storage capacity for three days with daily volume of up to 3 M Bytes should be provided.

An average large TOLL office would presently require daily storage of about 5 M Bytes for AMA. For reasons of economic expansion, this feature should support storage expansion of up to 60 M Bytes in 5 M Byte steps.

Transmission Facility

Data network will be used for the transmission of OM/AMA data to the processing centre. The present interface will support synchronous transmission of up to 9.6 K bit per sec. using CCITT X.25 protocol. The electrical interface will conform to CCITT X.21 bits. As a minimum requirement, the system will provide at least two independent X.25 across lines on each switch. Each interface can be used for parallel polling of different data files and also acts as security back up for the remaining interface(s).

File Organization

The data files will be logically organized to facilitate polling from the processing centre. In addition to the logical grouping of data, such as data generated on daily basis, etc., each logical file will not exceed a preset value of, say, 1 M Bytes long. This restriction will result in a reasonable maximum transmission time for each file. This also ensures that switches generating a high volume of OM/AMA data will have the data organized in more than one file such that parallel polling of different files using multiple access option will provide the capability to minimize elapsed polling time if deemed desirable.

Data Security

Due to the nature of AMA data, the system will provide the option to record and store billing information on more than one physical device. The security arrangement is provided by a primary recording system and an optional secondary recording system. Physical devices within a system must be of the same type but different storage media can be used for the primary and the secondary system. The primary system is used for polling and the secondary system is used only for back up purposes. If disk capability is available for AMA recording, it is logical to assume that disk will be the primary system because of economical and technical considerations.

Up to three days of turn around time is allowed for the downstream polling and data validation process. Therefore, storage space equiv-

alent to four days of expected daily data volume should be provided. Due to the preferred data structure of single file per tape, it becomes necessary to store daily AMA data on different tape units in a primary tape system. The three days data storage requirement also implies a minimum of five tape units in the primary tape system including one standby.

The secondary system will be a continuous single file data structure physically spread out on as much storage space as designated for this purpose. In order to provide instant transfer between tape units without loss of data, a minimum of two tape secondary system is recommended. DMS will rotate the recording on the two or more units when the tape on the active unit is exhausted.

Capability will be provided to manually initiate the transfer of data from disk to any available tape unit in an office. This is to ensure that the data can be physically transported using tape when the polling capability is unavailable for an extended period in an all disk recording configuration. The reverse capability of reinstating a disk will also be provided.

Due to the nature of OM data and the relative low data volume requirement, security system will not be explicitly provided to the same extent as AMA. A single device is expected to be used for continuous recording of OM until the file is requested to be closed for polling. The file and the device are expected to be released immediately after the polling session for subsequent recording. The polling is expected to take place daily and between the scheduled OM dump from DMS.

Application Protocol

The protocol is intended to be simple for implementation and designed as a machine-to-machine protocol. The protocol will consist of the following basic steps.

- 1) Call request from data processing centre to DMS.
- 2) Validation of the origin of the polling request by checking the originator identification in the data network protocol.
- 3) Data processing centre will then indicate either OM or AMA data is required.
- 4) DMS will respond by sending the identification and status of data file(s) available for polling or being polled by different users.
- 5) Data processing centre will then request data from a specific file with an offset from the beginning of the requested data file and the number of records to be transmitted from the file. This ca-

pability is provided to facilitate efficient retransmission of corrupted data blocks.

- 6) Step (5) can be repeated for as long as there is data to be polled or retransmitted.
- 7) Close of call will be initiated by the downstream processing centre at the end of the session.

Previously polled data files should be released by the processing centre using explicit commands as soon as the data validation process is completed by making a call request to DMS or before closing a call at the end of a polling session.

Package	NTX059AB04 POLLING OM & AUT.MSG ACCTG.DATA VIA DATAPAC(UPG	OF
Feature set	ADMINISTRATION	
Feature	DATAPAC POLLING AND RESTRUCTURE	
Feature no	F5437	

FEATURE SYNOPSIS

This feature represents a redesign of the software package known as DPAC. It is a low-level utility functioning under the file transferral package known as XFER, which supervises data polling activity. Specifically, this feature provides an X.25 interface to the Datapac public packet switched network.

FEATURE DESCRIPTION

The original software was released in early 1980 to meet the high demand for data polling within Bell Canada. Implementation was directed exclusively for an interface to the Canadian public packet switched network, known as Datapac. Several design constraints have been identified since the original release. Only one 10C card (1X67BB or 1X67DB) could be supported concurrently and subscription could be made to only one packet network - Datapac. The design incorporated elements which made it very vulnerable to queue corruption, when some unanticipated exception conditions arose.

The first release of this feature is to be packaged under the title DPAC. The acronym of DPC (Data Packet Controller) has been chosen for the 10C card, and the name DPCOMSUB for the package which is to control common, device dependent operations. When subsystem packages for protocol interfaces to other packet networks are developed, DPAC will represent only one of many options for the DPC product.

The DPC software is specific to this device and supports up to sixteen boards connected to various IOC's. The DPAC software performs only X.25 protocol functions on a particular board and imbeds logically in the DPC code for common maintenance and I/O functions. This DPAC interface still implements the SNAP T6 (Datapac) standard, but uses DPC software to employ a much more robust mechanism for queueing. These two software elements perform the same functions under XFER as did the original code and with XFER, form an extended interface to the device independent recording package (DIRP).

This configuration is design to allow upward compatibility in anticipation of requests for new protocol interfaces. With many protocols, it is conceivable that a DMS could subscribe simultaneously to several different packet networks connected to separate devices, each with their respective X.25 interfaces. A request for a new protocol becomes part of the normal feature identification process, not requiring any new device dependent software development.

Package	NTX059AB04 POLLING OM & AUT.MSG ACCTG.DATA VIA DATAPAC(UPG	OF
Feature set	ADMINISTRATION	
Feature	XFER SIMULTANEOUS POLLING	
Feature no	F5745	

FEATURE SYNOPSIS

This feature allows remote polling centres to poll files through the XFER system simultaneously. Any remote polling centre equipped with a multi-channel link or multiple links can also poll more than one data stream at a time. Each polling request must be for a data stream that is not being polled over a different channel or link at the time.

FEATURE DESCRIPTION

The remote data polling system, known as the XFER system, is a means by which a telco's data processing centers can request and receive information that has been collected at a DMS-100 site. The device independent recording package (DIRP) makes data files available for transmission by XFER, through the DATAPAC packet switching network, to remote processing centers. Types of data that can be polled are AMA, OM and JF.

At present XFER works as follows:

A remote data center places a call over the network to a DMS-100 with the XFER system software resident. The remote center must specify the type of data to be polled, i.e., AMA, OM or JF. Only the specified type of file can be requested and transmitted for the duration of the call. XFER processes only one call at a time. If a second call comes in while one is in progress, the second receives a data terminating equipment (DTE) clear message from the DATAPAC network, signifying that the XFER system refuses the call.

This feature adds the following enhancements: XFER system is modified to allow several calls from remote data centers to be processed simultaneously. The result is that a valid caller no longer receives a DTE clear when XFER is serving a different call at the time the request is made. Each call is processed individually. The call remains dedicated to the transmission of one data type only. If XFER determines that a particular subsystem is currently in use, the caller receives a message to that effect, and the call is terminated. For example, while one poller is receiving AMA files, those files are unavailable to other pollers requesting AMA. Any request for a data stream which is not being polled at the time, such as OM or JF, can be granted assuming that the caller is valid.

References:

BC1691 FDOC
NTP 297-1001-524 Remote Data Polling Description

PAL 85-07-001 Marketing Planning Letter - Application Protocol

NTX060AB10 Status: RTM NETWORK MANAGEMENT

ADMINISTRATION	:	
NM STATUS/CONTROL I/O		F0312
CODE CONTROLS	CODE POINT BLOCKING 3-10 DIGIT	F0317
DIRECTIONAL RESERVATION EQUIPMENT (DRE)		F0318
I/C TRUNK LOAD CONTROL		F0320
POSITION AND DISPLAY		F0321
O/G TRUNK GROUP CONTROL		F0322
ROUTE CONTROLS	KEY REROUTE	F0323
PROTECTIVE RESERVATION EQPT	(PRE)	F0325
ROUTE CONTROLS	CANCEL FROM	F0326
ROUTE CONTROLS	CANCEL TO	F0789
ROUTE CONTROLS	SKIP REROUTE	F0790
NETWORK MANAGEMENT IMPROVEMENTS		F1494
COUNTRY CODE BLOCKING		F1768
PROTECTIVE RESERVATION EQPT	INCREASED NO.OF RESERVED TRKS	F2250
MAINTENANCE	:	
NETWORK MANAGEMENT SHORT SLLI SIMPLIFICATION		F5758
ADMINISTRATION	:	
NETWORK MGMT TRUNK GROUP DATA REORGANIZATION		F5926
NETWORK MGMT TRUNK GROUP CONTROL INTERFACE REORG		F5937
CANCEL AND SKIP CONTROLS		F6029
ENHANCED CODE CONTROLS		F6248
MAINTENANCE	:	
DETECTION ENHANCEMENTS OF MACHINE CONGESTION CONDITION		F6250
ADMINISTRATION	:	
PREFIX CODES CONTROL		F6347

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	NM STATUS/CONTROL I/O
Feature no	F0312

DESCRIPTION

The I/O devices used to display the status of NWM and control it are:

- a) Visual Display Unit: (Refer to NWM position and display feature in the same package).
- b) Teleprinter: Network Management supports a 1200 baud R/O teleprinter which is primarily used for scheduled hard copy printouts of reports. This printer may be remoted, if required.
- c) Status Board: The status board provides NWM with a current lamp display (via Signal Distributor (SD) points) of the status of selected trunk groups. Lamps are illuminated when an attempt to seize a trunk from a trunk group(s) results in an overflow condition. Lamps are extinguished when there is a successful selection from the trunk group(s), that was previously in an overflow state. A maximum of 20 trunk groups can be associated with a single SD point which operates only when all groups are in the overflow state.

REFERENCE

NTP 297-1001-452

Package	NTX060AB10 NETWORK MANAGEMENT		
Feature set	ADMINISTRATION		
Feature	CODE CONTROLS	CODE POINT BLOCKING	
Feature no	F0317		

DESCRIPTION

The code blocking (CBK) control provides a means of limiting a percentage of the traffic into a congested area based on the destination code. The traffic blocked is subsequently routed to one of three announcements; NCA, EA1 or EA2. The percentage setting can be in the range of 1 to 100 .

Code blocking can be applied to any valid 1 through 15 digit string. The following lists several types of codes usually blocked:

- (a) NPA area code (AC)
- (b) NXX non-area code (NAC)
- (c) XXX country code (CC)
- (d) NPA-NXX area code + non-area code (AC + NAC)
- (e) NXX-XXXX non-area code + subscriber number (NAC + XXXX)
- (f) NPA-NXX-XXXX area code + non-area code + subscriber number

Provision for blocking more than one serving NPA is provided. A maximum of 256 code block controls of any combination of code types (i.e. AC, NAC or CC) and digits can be set.

REFERENCES

NTP 297-1001-452
NTP 297-1001-453

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	DIRECTIONAL RESERVATION EQUIPMENT (DRE)
Feature no	F0318

DESCRIPTION

DRE is a control (applied to two-way trunk groups) that gives priority to completing traffic by reserving a number of idle trunks in a group for this completing traffic. Originating traffic is skip-routed (i.e., overflows to the next group). DRE is applied in steps or levels to indicate the amount of control desired. These levels are directly associated with the number of trunks to be reserved in a trunk group. Levels are in the range of 0 to 7.

Whenever DRE is in effect (active), it skip-routes originating traffic when the number of idle trunks in the group is less than or equal to the level value. In this way the idle trunks are reserved for completing traffic which has already penetrated the network. Once DRE is enabled and the level setting is reached, 100% of all traffic (i.e., direct & alternate) offered to the two-way group will be skip-routed. The rerouting will continue until the number of idle trunks in the group increases past the trigger (level) point.

REFERENCE

NTP 297-1001-452

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	I/C TRUNK LOAD CONTROL
Feature no	F0320

DESCRIPTION

This feature is activated by an input command registering the called number external to the switching unit on a CLI list. All calls to the called number are identified whether the called party answers or not. An output record is generated as follows:

a) Trunk to Trunk (tandem)

Incoming trunk number, DN of called party, date and time

b) Line to Trunk (originating)

DN of calling and called parties, date and time. If the calling directory number cannot be identified, the number will be replaced by originating equipment number and tip and ring side identification, if available.

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	POSITION AND DISPLAY
Feature no	F0321

DESCRIPTION

The network management VDU position is used:

- a) To display continuous status information (updated every minute) such as types of NWM controls activated, total number of incoming seizures, percentage of CPU time usage, levels of DOC currently active, etc.
- b) To display temporary status information (remained on VDU until erased or replaced by others via input commands). There are two types of temporary status display used for monitoring purposes and observing the effect of active NWM controls. Once, called trunk group delay, provides the identity of the trunk group, the number of calls offered, ⁴ of calls overflowing, ACH and CCH, the CCS and number of calls deflected, etc. The other one, called control status display, gives the total number of differet controls (Group, code, route) which are active or in effect in the DMS office and the trunk group affected.
- c) To output threshold data and network management operational measurements.
- d) To apply network management controls.

REFERENCE

NTP 297-1001-452

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	O/G TRUNK GROUP CONTROL
Feature no	F0322

DESCRIPTION

The Incoming Trunk Busy (ITB) control allows the Network manager to restrict incoming attempts to an overloaded switch by selectively removing from service (i.e. busying out) a percentage of incoming or 2-way trunk groups that are equipped for remote-make-busy.

The control percentage leave can be in the range of 1 to 100 . This percentage applies to the number of working trunks in the incoming trunk group and excludes the number which are off-line (i.e., INB; Installation Busy).

The Network Manager has the ability to query any incoming trunk group and have displayed the number of trunks in the group, the number of maintenance busy and the number of NWM busy trunks. Also displayed is the percentage level setting and the calculated number of trunks that should be set NWM Busy.

The number of incoming trunks in the NWM Busy state is periodically adjusted to compensate for trunks being returned to or removed from service in order to keep the percentage setting constant.

REFERENCE

NTP 297-1001-452

Package	NTX060AB10 NETWORK MANAGEMENT		
Feature set	ADMINISTRATION		
Feature	ROUTE CONTROLS	KEY REROUTE	
Feature no	F0323		

DESCRIPTION

The Reroute control allows a percentage of traffic to be deflected from a designated trunk group route to a different trunk group route in the routing chain (i.e. out-of-chain routing). The percentage level setting can be in the range of 1 to 100th.

A maximum of 256 reroute numbers may be used. Each reroute number can in-turn point to a maximum of 16 combinations of routes and control percentage level settings. Only one of these combinations can be active at any one time.

REFERENCE

NTP 297-1001-452

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	PROTECTIVE RESERVATION EQPT (PRE)
Feature no	F0325

DESCRIPTION

PRE is a control that is similar to DRE, but PRE acts only on alternate-routed (AR) traffic offered to the two-way trunk group. Direct routed traffic is allowed full access. Once PRE is enabled and the level setting is reached, 100% of the AR traffic to the two-way home final is skip-routed.

REFERENCE

NTP 297-1001-452

Package	NTX060AB10 NETWORK MANAGEMENT		
Feature set	ADMINISTRATION		
Feature	ROUTE CONTROLS	CANCEL FROM	
Feature no	F0326		

DESCRIPTION

Cancel From

Cancel From is a control that limits traffic attempts overflowing from selected outgoing or two-way trunk groups.

CanF is similar to CanT in that it controls percentage level settings for direct and alternate traffic, and available routes to announcements.

Skip

This control reroutes a percentage of alternate and direct routed traffic offered to an outgoing trunk group by skipping over the specified group to the next trunk group in the routing chain.

Package	NTX060AB10 NETWORK MANAGEMENT		
Feature set	ADMINISTRATION		
Feature	ROUTE CONTROLS	CANCEL TO	
Feature no	F0789		

DESCRIPTION

Cancel To is a control that limits traffic attempts over one-way outgoing or two-way trunk groups and routes these to a specified announcement. This control cancels a preset percentage of the traffic offered to a particular trunk group. The control may affect only a percentage of alternate routed traffic, or may affect all alternate routed traffic and a percentage of direct routed traffic.

Traffic that is affected by 'Cancel To' can be routed to one of the following announcements:

- (a) No Circuit Announcement (NCA)
- (b) Emergency Announcement 1 (EA1)
- (c) Emergency Announcement 2 (EA2)

REFERENCE

NTP 297-1001-452

Package	NTX060AB10 NETWORK MANAGEMENT		
Feature set	ADMINISTRATION		
Feature	ROUTE CONTROLS	SKIP REROUTE	
Feature no	F0790		

SEE FEATURE NUMBER F0326

Package	NTX060AB10 NETWORK MANAGEMENT		
Feature set	ADMINISTRATION		
Feature	PROTECTIVE RESERVATION EQPT	INCREASED NO.OF RESE	
Feature no	F2250		

SEE FEATURE NUMBER F0325

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	MAINTENANCE
Feature	NETWORK MANAGEMENT SHORT SLLI SIMPLIFICATION
Feature no	F5758

FEATURE SYNOPSIS

This feature simplifies the use of the network management (NWM) levels of the MAP and the MASSCALL CI command by allowing full CLLI to be entered as well as short CLLIs in commands.

FEATURE DESCRIPTION

A short CLLI (maximum 6 characters) is a shortened form of a common language location identifier (maximum 16 characters) for a trunk group. Since trunk groups names tend to involve many characters, shorter names are often substituted for them. For example, RAL214 might be a short CLLI that corresponds to the full CLLI RALNC030214. This correspondence of short and full CLLI is defined in the table CLLI MTCE (NTP297-1001-451).

At the NWM level of AutoCtrl and GrpCtrl short CLLIs are currently required. They are also required by the mass call command to identify trunk group. This feature changes all displays containing short CLLIs to include both the full and short CLLIs. The one exception occurs on the NWM top level, the six short CLLIs that indicate the most recent. Finals in overflow conditions (FS) are not changes, and their corresponding full CLLIs are not displayed.

In the event that both short and full CLLI string are matched, the short CLLI are searched first. If no match is found, the full CLLI are searched. This ensures required compatibility for all existing installations.

Ref: BC1718

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	NETWORK MGMT TRUNK GROUP DATA REORGANIZATION
Feature no	F5926

FEATURE SYNOPSIS

This feature reorganizes the network management trunk group data in order to permit new capabilities to be added in the future. No functional changes are performed.

FEATURE DESCRIPTION

This feature adds a new office parameter - number of engineerable network management trunk group controls - which resides in table OFCENG and has a range 0-255. It's purpose is to define the maximum number of trunk groups that can be controlled concurrently by these new future trunk group controls.

Ref: FDOC BC1722

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	NETWORK MGMT TRUNK GROUP CONTROL INTERFACE REORG
Feature no	F5937

FEATURE SYNOPSIS

This feature reorganizes the internal S/W interfaces for DMS Network Management trunk group controls in order to permit new capabilities to be added more easily later. No functional changes are affected.

FEATURE DESCRIPTION

The primary goal of this feature is to introduce greater flexibility in the number and types of parameters supported by the utility procedures and the PREPLANS table. This greater flexibility will allow future network management capabilities to be implemented at a lower cost. No new capabilities are implemented by this feature, and no changes are made to the existing man machine interface.

Ref: AF0056 FDOC

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	CANCEL AND SKIP CONTROLS
Feature no	F6029

FEATURE SYNOPSIS

This feature provides the ability to specify percentage control levels for both direct and alternate routed traffic for the cancel-to, cancel-from, and skip network management trunk group controls.

FEATURE DESCRIPTION

Currently the cancel-to, skip and cancel-from (CANT, SKIP and CANF), network management trunk group controls allow the Telco to specify the percentage of traffic to be controlled for either direct-routed (DR) traffic or alternate routed (AR) traffic, but not both.

This feature allows the Telco to specify percentage control levels for both DR and AR traffic. These percentages may be any value from 0 to 100 in increments of 1. Any combination of the two percentages is allowed, except setting both to zero.

Ref: AF0154 FDOC

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	ENHANCED CODE CONTROLS
Feature no	F6248

FEATURE SYNOPSIS

This activity provides the ability to allow MMI to apply/remove code controls to all NPAs; allow 0.10 sec interval call gapping.

FEATURE DESCRIPTION

This feature affects the capabilities provided to the craftsperson in three areas:

1. Alters the man-machine interface (MMI) to allow code controls to be applied/removed to all numbering plan areas (NPAs) serviced by the office.
2. Alters the code control call gapping rate to allow the gapping rate to be specified in the range of 0.0 seconds to 600.0 seconds in increments of tenths of seconds.
3. Adds an additional field to the code block group (CBK) of the operational measurements (OM) facility to allow the gathering of peg count information on calls passed by (calls not blocked) by a code control.

Code controls allow the user to limit traffic from entering the network (code block) according to the destination code, flag certain codes as being hard to reach (HTR), or to study traffic levels routed to specified destination codes (pre-route peg). Code control code blocking is defined in one of two ways - a) percent, which is the level of blockage, and b) gap, which is the duration between completed calls.

Prior to this feature, there was no method of quickly placing a code control against all NPAs serviced by the office (they would have to be individually placed against each NPA). There was also no way of determining how many calls were not blocked by a code control. Additionally, the call gapping rate was specified in the range from 0 to 360 seconds in 1 second increments.

Ref: DDOC AF0166

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	MAINTENANCE
Feature	DETECTION ENHANCEMENTS OF MACHINE CONGESTION CONDI
Feature no	F6250

FEATURE SYNOPSIS

This feature provides the necessary software to do the following: trigger MC1 and MC2 from either MF queue length or CPU occupancy and trigger all overload conditions (SILC and DOC) by table.

FEATURE DESCRIPTION

This feature enhances the current MC1 and MC2 conditions by allowing each MC condition to be triggered by either multifrequency (MF) receiver queue length or central processing unit (CPU) occupancy thresholds. It also combines the network management selective incoming load control (NWMSILC) and network management internal dynamic overload control (NWMIDOC) tables. Collection of operational measurements (OMs) pertaining to the MC1 and MC2 conditions is also performed.

Ref: DDOC AF0181

Package	NTX060AB10 NETWORK MANAGEMENT
Feature set	ADMINISTRATION
Feature	PREFIX CODES CONTROL
Feature no	F6347

FEATURE SYNOPSIS

This feature makes it possible to apply a preroute peg prefix code control as well as code block percent, a code block call gap, or a hard to reach flag prefix code control against the same destination code.

FEATURE DESCRIPTION

This feature modifies the method of applying prefix code controls to the office. Both preroute peg prefix code and one of the other code controls can be applied to the same destination code. Prior to this feature, only one prefix code control could be in effect at any time on a particular destination code, even though the system allowed more than one prefix code control to be assigned against that destination code.

A code control is applied against a code type within the office. There are four within the office. These are numbering plan area code, office code, country code and prefix code. A prefix code control can only be applied in an equal access office.

Code block percent is a percentage based level of blocking. Code block call gap is based on the time duration between completed calls. The hard to reach flag indicates a particular destination as hard to reach.

The restrictions and limitations of a prefix code control are:

- 1) It cannot be applied against a prefix code that does not exist within the office.
- 2) An existing office prefix code cannot be removed if a code control exists against it.
- 3) '950' dialling codes are not considered prefix codes.
- 4) '0ZZ' dialling codes are not considered prefix codes.
- 5) Attempts to applying a prefix code control in a non-equal access office, will result in 'Not an equal access office' error message and no application of the control.

NTX060BA02 Status: A+M NETWORK MANAGEMENT - ENHANCED(REPL. BY

ADMINISTRATION	:	
DYNAMIC OVERLOAD CONTROL (DOC)		F0319
AUTOMATIC OUT-OF-CHAIN ROUTING (AOCR)		F0671
HARD TO REACH CODE LIST (HTR)		F0672
SELECTIVE DYNAMIC OVERLOAD CONTROL (SDOC)		F0673
SELECTIVE TRUNK RESERVATION (STR)		F0674
CODE CONTROL - EQUAL ACCESS		F1738
SELECTIVE INCOMING LOAD CONTROL(SILC)		F3705
CONTROL ENHANCEMENTS	:	
REDUCED SILC GAPPIG INTERVAL		F6027
SILC DATABASE ROBUSTNESS		F6058

Package	NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BB)
Feature set	ADMINISTRATION
Feature	DYNAMIC OVERLOAD CONTROL (DOC)
Feature no	F0319

DESCRIPTION

The general principle of DOC is to apply a number of Network Management controls or signals automatically in response to an external signal or an overload condition detected in the switch itself. There are two types of DOC; Internal DOC, and Remote DOC. The application of controls in response to an external signal is Remote DOC, while the generation of signal because of an internally detected overload is known as Internal DOC. For the purposes of this description Remote DOC is renamed PrePlanned Controls.

Internal Dynamic Overload Control (IDOC)

The purpose of IDOC is to reduce the load offered to the controlling office by requesting selected subtending or contiguous offices to implement a predefined set of routing controls. IDOC is a signal generated and transmitted by the controlling office in response to internally detected overload indicators.

When the controlling DMS office determines that it is approaching a state of congestion (i.e., overload), it transmits a continuous control signal to its selected subtending office(s). To initiate this control signal an SD (Signal Distributor) point is enabled. The SD point is extended to facilities to the appropriate subtending office(s).

The controlling DMS office has the ability to generate three IDOC signal levels. Level 1 signal is applied when the number of incoming MF (Multi-Frequency) calls waiting for a receiver exceeds a threshold (1) for 5 minutes. This level is released (deactivated) if it is less than threshold (2) (less than threshold 1) for 2 minutes. The decision to apply or remove the IDOC level 1 signal is made every minute.

The IDOC level 2 signal is applied if IDOC level 1 is active and the percentage of machine CPU time devoted to call processing is greater than threshold 3 for 5 minutes. The IDOC level 2 signal is released (deactivated) when the call processing CPU usage is less than threshold 4 for 2 minutes. As in IDOC level 1, the decision to apply or remove the IDOC level 2 signal is made every minute.

The IDOC level 3 signal is applied if the DMS system has host processing ability. IDOC levels 1 and 2 can be disabled or applied manually, while level 3 is not under mal control of ????. Thresholds are entered as office data.

Preplanned Number Control (PPLN)

The purpose of PPLN is the application of Network Management controls in response to an external signal from a subtending office. This feature is simply the concept of preplanned controls that are activated by scan point or via the MAP.

A maximum of 256 preplan numbers each containing 32 trunk group controls can be activated by scan point or MAP command. Only one (of the 32) trunk group controls per preplan number can be active at any one time. Preplans associated with scan point activation can be disabled at any time, if required.

REFERENCE

NTP 297-1001-452

Package	NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BA02)
Feature set	ADMINISTRATION
Feature	AUTOMATIC OUT-OF-CHAIN ROUTING (AOOCR)
Feature no	F0671

DESCRIPTION

Automatic Out-of-Chain Routing (AOOCR): Automatic out of chain routing provides extended routing of calls that overflow their in chain finals. This extended routing is allowed out if idle capacity exists in the via switching machine. An AOOCR route can be turned off for a timed interval (5 to 10 minutes) when any of the following conditions occur:

1. The via office in the AOOCR sends a DOC signal.
2. The occupancy of the trunk group restricts access due either to STR or a no circuit (NC) condition to the via office.

Package	NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BA02)
Feature set	ADMINISTRATION
Feature	HARD TO REACH CODE LIST (HTR)
Feature no	F0672

DESCRIPTION

This control is a refinement on code blocking. If traffic to a certain code point is determined to have a low probability of completion the codes are input by DMO and flagged as HTR. An attempt will be made to forward this traffic provided spare resources are available. This is unlike code blocking which would block a call even in light traffic.

HTR is an integral part of the Selective Trunk Reservation (STR) feature.

Package NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BA02)
 Feature set ADMINISTRATION
 Feature SELECTIVE TRUNK RESERVATION (STR)
 Feature no F0674

DESCRIPTION

The Selective Trunk Reservation (STR) feature dynamically observes the occupancy of an outgoing trunk group and applies one of two filters to the offered traffic at high levels of trunk group occupancy.

When the number of idle trunks in a group or subgroup reaches a threshold as defined by the network manager, traffic is controlled (Level I). As the number of idle trunks reaches a second threshold traffic is further controlled (Level II).

HU groups can only be compared to one threshold while full or final groups are compared to both levels.

⁴ calls controlled per class of traffic:

	LEVEL 1	LEVEL 2
	-----	-----
HTR alternate	3	100
HTR first routed	3	75
Unspecified alternate	0	100
Unspecified first routed	0	3

³ 25, 50, 75 or 100⁴ as specified by network manager.

Package	NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BB)
Feature set	ADMINISTRATION
Feature	CODE CONTROL - EQUAL ACCESS
Feature no	F1738

FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the requirements for the Equal Access End Office(EAEO) in DMS. In particular, this feaure implements the new network management utilities needed in the equal access environment.

FEATURE DESCRIPTION:

Code controls need to be modified to handle combinations of digits brought about by the IC dialling plan. These controls can be either call blocking or call gapping controls. The combination of digits needed are:

- 1) Code Control, Ignoring IC/INC Prefix
It should be possible to apply code controls on any NANP (North American Numbering Plan) code regardless of the IC/INC prefix digits. The ability to do this already exists in present network management manual controls.
- 2) Code Control on IC/INC Prefix Only
It should be possible to apply code controls on any IC/INC prefix, including calls routed to a customer's PIC (Presubscribed Interexchange Carrier) regardless of the destination code. It should be mentioned here that the implementation of code controls on the IC/INC Prefix only will enable the user to put code controls on any set of prefix digits that are associated with an equal access call (OZZ + YXX in the Access Tandem).
- 3) Code Control on IC/INC Prefix and Destination Digits
It should be possible to apply code controls on any NANP code or international code with a specific IC/INC prefix. This would include calls such as 10XXX + NPA, 10XXX + NPA + NXX, and 10XXX + Country Code. The implementation of this network management feature for equal access environments will enable code controls on any combination of prefix digits and destination digits regardless of equal access.

Any code controls will be removed automatically on a cold restart and thus make it necessary to reapply them. This is done on present code controls and will be done on the code controls added by this feature.

References

FSD 20-24-0000
FDOC C1128

Package	NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BA02)
Feature set	ADMINISTRATION
Feature	SELECTIVE INCOMING LOAD CONTROL(SILC)
Feature no	F3705

A new network management control, SILC, is added to the existing NM capability. This control is intended primarily as a substitute for Dynamic Overload Control (DOC) when it is not supported by IC's in an Equal Access environment.

In the absence of DOC, SILC permits incoming and two-way trunk groups to limit incoming traffic according to preset rate/percentage values.

Package	NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BB)
Feature set	CONTROL ENHANCEMENTS
Feature	REDUCED SILC GAPPING INTERVAL
Feature no	F6027

FEATURE SYNOPSIS

This feature expands the range of selective incoming load control gapping interval from 0-360 seconds to 0-600 seconds and reduces the increment from 1 second to 0.1 second.

FEATURE DESCRIPTION

Selective incoming load control (SILC) is a network management mechanism used to reduce incoming traffic from connecting offices that are not equipped (or unwilling) to respond to dynamic overload control (DOC) signals. SILC based gap control, when specified, guarantees a minimum time interval, call the gapping rate, between incoming calls. Any incoming call attempt during the enforced gap is blocked.

Prior to this feature the gapping time interval could be specified in the range of values from 0 to 360 seconds in 1 second increments. This feature expands the range to 0.0-600.0 seconds and refines the increment to 0.1 second.

Ref: BC1398 FDOC

Package	NTX060BA02 NETWORK MANAGEMENT - ENHANCED(REPL. BY NTX060BB)
Feature set	CONTROL ENHANCEMENTS
Feature	SILC DATABASE ROBUSTNESS
Feature no	F6058

FEATURE SYNOPSIS

This feature restructures the selective incoming load control (SILC) trunk group database so that it can be retained over all system restarts. This feature also permits the SILC database to be dumped and restored.

FEATURE DESCRIPTION

SILC is a network management mechanism, which is used to reduce incoming traffic from connecting offices that do not respond to dynamic overload control signals.

Prior to this feature the SILC trunk group database was defined using network management MAP group control (GRPCTRL) level. This feature changes the method of defining SILC trunk group database by adding table SILCNWM used by the table editor and keyed off the trunk group CLLI.

This feature does not affect the operation using the network management MAP auto control (AUTOCTRL) level.

Ref: AF0081 FDOC

NTX060BB01 Status: RTM NETWORK MANAGEMENT - ENHANCED (UPGR. OF

ADMINISTRATION	:	
DYNAMIC OVERLOAD CONTROL (DOC)		F0319
AUTOMATIC OUT-OF-CHAIN ROUTING (AOCR)		F0671
HARD TO REACH CODE LIST (HTR)		F0672
SELECTIVE DYNAMIC OVERLOAD CONTROL (SDOC)		F0673
SELECTIVE TRUNK RESERVATION (STR)		F0674
CODE CONTROL - EQUAL ACCESS		F1738
SELECTIVE INCOMING LOAD CONTROL(SILC)		F3705
CONTROL ENHANCEMENTS	:	
REDUCED SILC GAPPIG INTERVAL		F6027
SILC DATABASE ROBUSTNESS		F6058
FLEXIBLE REROUTE(FRR)-MMT,OM AND DB		F6059

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	ADMINISTRATION
Feature	DYNAMIC OVERLOAD CONTROL (DOC)
Feature no	F0319

DESCRIPTION

The general principle of DOC is to apply a number of Network Management controls or signals automatically in response to an external signal or an overload condition detected in the switch itself. There are two types of DOC; Internal DOC, and Remote DOC. The application of controls in response to an external signal is Remote DOC, while the generation of signal because of an internally detected overload is known as Internal DOC. For the purposes of this description Remote DOC is renamed PrePlanned Controls.

Internal Dynamic Overload Control (IDOC)

The purpose of IDOC is to reduce the load offered to the controlling office by requesting selected subtending or contiguous offices to implement a predefined set of routing controls. IDOC is a signal generated and transmitted by the controlling office in response to internally detected overload indicators.

When the controlling DMS office determines that it is approaching a state of congestion (i.e., overload), it transmits a continuous control signal to its selected subtending office(s). To initiate this control signal an SD (Signal Distributor) point is enabled. The SD point is extended to facilities to the appropriate subtending office(s).

The controlling DMS office has the ability to generate three IDOC signal levels. Level 1 signal is applied when the number of incoming MF (Multi-Frequency) calls waiting for a receiver exceeds a threshold (1) for 5 minutes. This level is released (deactivated) if it is less than threshold (2) (less than threshold 1) for 2 minutes. The decision to apply or remove the IDOC level 1 signal is made every minute.

The IDOC level 2 signal is applied if IDOC level 1 is active and the percentage of machine CPU time devoted to call processing is greater than threshold 3 for 5 minutes. The IDOC level 2 signal is released (deactivated) when the call processing CPU usage is less than threshold 4 for 2 minutes. As in IDOC level 1, the decision to apply or remove the IDOC level 2 signal is made every minute.

The IDOC level 3 signal is applied if the DMS system has host processing ability. IDOC levels 1 and 2 can be disabled or applied manually, while level 3 is not under mal control of ????. Thresholds are entered as office data.

Preplanned Number Control (PPLN)

The purpose of PPLN is the application of Network Management controls in response to an external signal from a subtending office. This feature is simply the concept of preplanned controls that are activated by scan point or via the MAP.

A maximum of 256 preplan numbers each containing 32 trunk group controls can be activated by scan point or MAP command. Only one (of the 32) trunk group controls per preplan number can be active at any one time. Preplans associated with scan point activation can be disabled at any time, if required.

REFERENCE

NTP 297-1001-452

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	ADMINISTRATION
Feature	AUTOMATIC OUT-OF-CHAIN ROUTING (AOOCR)
Feature no	F0671

DESCRIPTION

Automatic Out-of-Chain Routing (AOOCR): Automatic out of chain routing provides extended routing of calls that overflow their in chain finals. This extended routing is allowed out if idle capacity exists in the via switching machine. An AOOCR route can be turned off for a timed interval (5 to 10 minutes) when any of the following conditions occur:

1. The via office in the AOOCR sends a DOC signal.
2. The occupancy of the trunk group restricts access due either to STR or a no circuit (NC) condition to the via office.

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	ADMINISTRATION
Feature	HARD TO REACH CODE LIST (HTR)
Feature no	F0672

DESCRIPTION

This control is a refinement on code blocking. If traffic to a certain code point is determined to have a low probability of completion the codes are input by DMO and flagged as HTR. An attempt will be made to forward this traffic provided spare resources are available. This is unlike code blocking which would block a call even in light traffic.

HTR is an integral part of the Selective Trunk Reservation (STR) feature.

Package NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
 Feature set ADMINISTRATION
 Feature SELECTIVE TRUNK RESERVATION (STR)
 Feature no F0674

DESCRIPTION

The Selective Trunk Reservation (STR) feature dynamically observes the occupancy of an outgoing trunk group and applies one of two filters to the offered traffic at high levels of trunk group occupancy.

When the number of idle trunks in a group or subgroup reaches a threshold as defined by the network manager, traffic is controlled (Level I). As the number of idle trunks reaches a second threshold traffic is further controlled (Level II).

HU groups can only be compared to one threshold while full or final groups are compared to both levels.

⁴ calls controlled per class of traffic:

	LEVEL 1 -----	LEVEL 2 -----
HTR alternate	3	100
HTR first routed	3	75
Unspecified alternate	0	100
Unspecified first routed	0	3

³ 25, 50, 75 or 100⁴ as specified by network manager.

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	ADMINISTRATION
Feature	CODE CONTROL - EQUAL ACCESS
Feature no	F1738

FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the requirements for the Equal Access End Office(EAEO) in DMS. In particular, this feaure implements the new network management utilities needed in the equal access environment.

FEATURE DESCRIPTION:

Code controls need to be modified to handle combinations of digits brought about by the IC dialling plan. These controls can be either call blocking or call gapping controls. The combination of digits needed are:

- 1) Code Control, Ignoring IC/INC Prefix
It should be possible to apply code controls on any NANP (North American Numbering Plan) code regardless of the IC/INC prefix digits. The ability to do this already exists in present network management manual controls.
- 2) Code Control on IC/INC Prefix Only
It should be possible to apply code controls on any IC/INC prefix, including calls routed to a customer's PIC (Presubscribed Interexchange Carrier) regardless of the destination code. It should be mentioned here that the implementation of code controls on the IC/INC Prefix only will enable the user to put code controls on any set of prefix digits that are associated with an equal access call (OZZ + YXX in the Access Tandem).
- 3) Code Control on IC/INC Prefix and Destination Digits
It should be possible to apply code controls on any NANP code or international code with a specific IC/INC prefix. This would include calls such as 10XXX + NPA, 10XXX + NPA + NXX, and 10XXX + Country Code. The implementation of this network management feature for equal access environments will enable code controls on any combination of prefix digits and destination digits regardless of equal access.

Any code controls will be removed automatically on a cold restart and thus make it necessary to reapply them. This is done on present code controls and will be done on the code controls added by this feature.

References

FSD 20-24-0000
FDOC C1128

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	ADMINISTRATION
Feature	SELECTIVE INCOMING LOAD CONTROL(SILC)
Feature no	F3705

A new network management control, SILC, is added to the existing NM capability. This control is intended primarily as a substitute for Dynamic Overload Control (DOC) when it is not supported by IC's in an Equal Access environment.

In the absence of DOC, SILC permits incoming and two-way trunk groups to limit incoming traffic according to preset rate/percentage values.

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	CONTROL ENHANCEMENTS
Feature	REDUCED SILC GAPPING INTERVAL
Feature no	F6027

FEATURE SYNOPSIS

This feature expands the range of selective incoming load control gapping interval from 0-360 seconds to 0-600 seconds and reduces the increment from 1 second to 0.1 second.

FEATURE DESCRIPTION

Selective incoming load control (SILC) is a network management mechanism used to reduce incoming traffic from connecting offices that are not equipped (or unwilling) to respond to dynamic overload control (DOC) signals. SILC based gap control, when specified, guarantees a minimum time interval, call the gapping rate, between incoming calls. Any incoming call attempt during the enforced gap is blocked.

Prior to this feature the gapping time interval could be specified in the range of values from 0 to 360 seconds in 1 second increments. This feature expands the range to 0.0-600.0 seconds and refines the increment to 0.1 second.

Ref: BC1398 FDOC

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	CONTROL ENHANCEMENTS
Feature	SILC DATABASE ROBUSTNESS
Feature no	F6058

FEATURE SYNOPSIS

This feature restructures the selective incoming load control (SILC) trunk group database so that it can be retained over all system restarts. This feature also permits the SILC database to be dumped and restored.

FEATURE DESCRIPTION

SILC is a network management mechanism, which is used to reduce incoming traffic from connecting offices that do not respond to dynamic overload control signals.

Prior to this feature the SILC trunk group database was defined using network management MAP group control (GRPCTRL) level. This feature changes the method of defining SILC trunk group database by adding table SILCNWM used by the table editor and keyed off the trunk group CLLI.

This feature does not affect the operation using the network management MAP auto control (AUTOCTRL) level.

Ref: AF0081 FDOC

Package	NTX060BB01 NETWORK MANAGEMENT - ENHANCED (UPGR. OF NTX060BA)
Feature set	CONTROL ENHANCEMENTS
Feature	FLEXIBLE REROUTE(FRR)-MMT,OM AND DB
Feature no	F6059

FEATURE SYNOPSIS

Flexible reroute control (FRR) makes it possible to reroute calls from an in-chain route to a VIA route when the in-chain route is overloaded or has failed.

FEATURE DESCRIPTION

The FRR control is an expansive Network Management (NWM) control for trunk groups which makes it possible to reroute calls from an in-chain route to a VIA route.

FRR control is not intended to replace the reroute (RRTE) which is a route list control (FRR is a trunk group control).

FRR control involves two trunk groups. The first trunk group, the in-chain route, is the trunk group that the FRR control is applied to. This trunk group is also referred to as the controlled trunk group. Calls offered to the VIA route are referred to as rerouted calls. FRR controls are applied to trunk groups manually or automatically.

Ref: AF0096 FDOC, GFX060AB01 Basic Network Management

NTX063AA02 Status: RTM ECHO SUPPRESSOR

MAINTENANCE AND TESTING	:	
108 TEST LINE (ECHO SUPPRESSION LOOP-AROUND)		F0685
SIGNALING AND SUPERVISION	:	
DIGITAL ECHO SUPPRESSORS	SERVICE CIRCUIT	F0686
ECHO SUPPRESSOR CIRCUITS - EXTENDED TO 5000		F2403

Package	NTX063AA02 ECHO SUPPRESSOR
Feature set	MAINTENANCE AND TESTING
Feature	108 TEST LINE (ECHO SUPPRESSION LOOP-AROUND)
Feature no	F0685

DESCRIPTION

The 108 Test Line provides far end loop-around terminations to which a near-end Echo Suppression Measuring Set (ESMS) is connected for the purpose of testing Echo Suppressors (ES).

The Test Sequence is as follows:

- a. The originating toll office connects its Echo Suppression Measuring Set (ESMS), typically a 58 ESMS, and then proceeds to seize an outgoing intertoll trunk (which has an Echo Suppressor (ES)).
- b. After switching an outgoing trunk (called the Trunk Under Test, TUT), the originating office dials the 108 test line code.
- c. The DMS office translates the 108 code and connects the incoming trunk to test PORT 0 of the 108 test line. A 1 KHz tone is then sent to the originating office which it calibrates the ESMS.
- d. The originating office then seizes another outgoing trunk (with an ES), called the AUXILIARY trunk, and then dials the 108 test line code again.
- e. The DMS office translates the 108 code and connects the AUXILIARY trunk to test PORT 1 of the 108 test line, cuts off the 1 KHz tone and cuts through a connection to PORT 0.
- f. Once the PORT 1 connection is established, the originating end transmits a 1 KHz tone on the AUXILIARY trunk through the 108 test line and back over the Trunk Under Test (TUT). This TUT is used as a reference trunk for subsequent testing of Echo Suppressors.
- g. The originating end then performs the required tests (via a test board) on the ES. (All testing is transparent to the DMS)
- h. When testing on the TUT is finished, the originating office releases it and then proceeds to seize the next required trunk and dials the 108 test line code on TUT trunk. When all trunks that require testing are completed, the originating end goes on-hook on both the TUT and AUXILIARY trunks. The DMS in turn releases (idles) the 108 test line termination set.

Package	NTX063AA02 ECHO SUPPRESSOR		
Feature set	SIGNALING AND SUPERVISION		
Feature	DIGITAL ECHO SUPPRESSORS	SERVICE CIRCUIT	
Feature no	F0686		

DESCRIPTION

In the DMS-200 system, the Digital Echo Suppressors (DES) are provided as a pool of service circuits, interfaced at the DCM shelf. The DES are accessed and inserted in the communication path when required as part of an incoming or outgoing facility (analog or digital). The digital echo suppressor has been designed to meet the related CCITT recommendations and is compatible with analog echo suppressors.

Depending on the total return delay of trunk circuit, the DES unit can operate in 2 modes.

1. Split echo suppression (Delay < 70 millisecc.)
2. Full echo suppression (Delay > 70 millisecc.)

The echo suppressor is equipped with a tone disabler which prevents the introduction of the suppression when data or other specified tone signals are transmitted through the device.

Testing of the suppressor is achieved within the DMS-200 switch via diagnostics software and tone level measuring equipment.

Package	NTX063AA02 ECHO SUPPRESSOR
Feature set	SIGNALING AND SUPERVISION
Feature	ECHO SUPPRESSOR CIRCUITS - EXTENDED TO 5000
Feature no	F2403

FEATURE SYNOPSIS

The limit on the maximum number of echo suppressor circuits in a DMS office has been increased from 1024 to 5120.

FEATURE DESCRIPTION

Package	NTX064AA01 AUTOMATIC LINE INSULATION TESTING (ALIT)
Feature set	MAINTENANCE AND TESTING
Feature	AUTOMATIC LINE INSULATION TESTING (ALIT)
Feature no	F0687

DESCRIPTION

Automatic line insulation (ALIT) performs the following:

a) Foreign EMF test: This is used to determine if any AC or DC voltages in the line exceed a certain value (Telco modifiable, default value is 2V AC and +/-2V DC) to affect the operation of the line card. The following tasks are performed:

- AC measurement (T to G, R to G, T to R)
- DC measurement (T to G, R to G, T to R)

b) Leakage resistance test: This is used to determine if there is any leakage resistance low enough (value is Telco modifiable, default value is 10,000 ohms) to be service affecting. The following tasks are performed:

- Tip to ground resistance
- Ring to ground resistance
- Tip to ring resistance

The LEN's to be tested, the starting time, the termination line, the threshold values can be specified from the LTP terminal.

NTX065AA10 Status: RTM SERVICE ANALYSIS

ADMINISTRATION	:	
SERVICE ANALYSIS	TOPS	F0553
SERVICE ANALYSIS	LINES	F0689
SERVICE ANALYSIS	TRUNKS	F0690
SERVICE ANALYSIS	MONITOR LINK DIAL BACK	F2309
S.A.INCREASEED SAMPLE RATE		F2579
SERVICE ANALYSIS DMS-300		F3010
AOSS SERVICE ANALYSIS		F3707
SERVICE ANALYSIS FOR ATC TRUNKS		G0070

Package	NTX065AA10 SERVICE ANALYSIS		
Feature set	ADMINISTRATION		
Feature	SERVICE ANALYSIS	TOPS	
Feature no	F0553		

DESCRIPTION

THE DMS 200 SERVICE ANALYSIS IS AUGMENTED TO REFLECT THE PRESENCE OF OPERATOR ASSISTED TRAFFIC ON THE DMS 200. THE AREAS AFFECTED ARE:

- ADDITIONAL CALL TYPE SELECTION FOR ANALYSIS (TOPS, DDO)
- SELECTION OF AN OPERATOR IN A SPECIFIC TRAFFIC OFFICE
- ADDITION OF TOPS CALLS IN DISPLAY OF QUOTE ACCUMMULATION.

Package	NTX065AA10 SERVICE ANALYSIS		
Feature set	ADMINISTRATION		
Feature	SERVICE ANALYSIS	LINES	
Feature no	F0689		

DESCRIPTION

Service analysis (SA) is a telephony management system that is designed to appraise the quality of service provided by the telco equipment and its personnel. This is accomplished by monitoring, on a random basis, subscriber dialed and operator assisted calls in order to obtain data that can be analysed and evaluated. This data then provides information as to the quality and completeness of service offered to telephone users.

Service analysis is initiated and carried out by a service analyst who interacts with the DMS system. The analyst performs the SA functions by listening to calls and noting the events in a call as they occur. The events of interest in service analysis are machine (software) recognized and analyst detected events. All subjective information (events) pertaining to each call is contributed by the analyst, while non-subjective data and cumulative timing is done automatically by the DMS system. In addition, the analyst controls the number and types of calls that are to be analysed.

Service analysis is performed from a service analysis position which consists of the following analyst interfaces:

1. A visual display unit (VDU) and associated keyboard.
2. A receive-only (i.e., monitor) voice channel.
3. A teleprinter.

For detailed information on service analysis, refer to:

- NTP 297-1001-470
- NTP 297-1001-471

Package	NTX065AA10 SERVICE ANALYSIS		
Feature set	ADMINISTRATION		
Feature	SERVICE ANALYSIS	TRUNKS	
Feature no	F0690		

DESCRIPTION

Service analysis (SA) is a telephony management system that is designed to appraise the quality of service provided by the telco equipment and its personnel. This is accomplished by monitoring, on a random basis, subscriber dialed and operator assisted calls in order to obtain data that can be analysed and evaluated. This data then provides information as to the quality and completeness of service offered to telephone users.

Service analysis is initiated and carried out by a service analyst who interacts with the DMS system. The analyst performs the SA functions by listening to calls and noting the events in a call as they occur. The events of interest in service analysis are machine (software) recognized and analyst detected events. All subjective information (events) pertaining to each call is contributed by the analyst, while non-subjective data and cumulative timing is done automatically by the DMS system. In addition, the analyst controls the number and types of calls that are to be analysed.

Service analysis is performed from a service analysis position which consists of the following analyst interfaces:

1. A visual display unit (VDU) and associated keyboard.
2. A receive-only (i.e., monitor) voice channel.
3. A teleprinter.

For detailed information on service analysis, refer to:

- NTP 297-1001-470
- NTP 297-1001-471

Package	NTX065AA10 SERVICE ANALYSIS		
Feature set	ADMINISTRATION		
Feature	SERVICE ANALYSIS	MONITOR LINK DIAL BA	
Feature no	F2309		

FEATURE SYNOPSIS

A service analysis monitor link is established on a dial-back basis through the network to ring the analyst at the remote location. An ANI spill is provided for local exchanges on toll dial-back calls.

FEATURE DESCRIPTION

Package	NTX065AA10 SERVICE ANALYSIS
Feature set	ADMINISTRATION
Feature	S.A.INCREASEED SAMPLE RATE
Feature no	F2579

FEATURE SYNOPSIS

The purpose of this feature is to increase the number of calls of a particular type that can be presented to the analyst for Service Analysis (SA). This increase is limited by the total volume of traffic of that call type.

FEATURE DESCRIPTION

This feature, an enhanced version of SA screening, has the potential to speed the screening process. The chances of catching a specially selected call using the same call mix have increased due to the 10:1 increase in screening capacity of the software.

The impact for the user is minimal. Statistical analysis indicated that there was no optimal maximum of calls that could be screened to acquire the desired speed up, so ten was chosen as a manageable maximum limit. The effectiveness of this feature depends to a large part on the call rate and mix of calls in a switch when analysis is performed. If the number of usable calls is infrequent, then an analyst can expect to wait between displayed calls despite the new search technique.

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Package	NTX065AA10 SERVICE ANALYSIS
Feature set	ADMINISTRATION
Feature	SERVICE ANALYSIS DMS-300
Feature no	F3010

FEATURE DESCRIPTION

Service Analysis (SA) is a telephone observation system that is designed to appraise the quality of service provided by the Telco and its personnel. This is accomplished by monitoring, on a random basis, calls to obtain data that can be analyzed and evaluated. With this data, an indication of the quality and completeness of service offered to the telephone users is obtained.

This feature will make available on the common base, many of the Teleglobe DMS300 SA capabilities. These capabilities will be available as an optional package for the gateway project.

Involved in the feature is the inclusion of various Teleglobe service analysis commands, as well as the inclusion of the displays on the VDU. A number of current Teleglobe service analysis commands are not included as their functions are either performed by service analysis commands present in the common base or they were deemed unnecessary or not able to be implemented at the present time. The DMS 300 SA events are:

Gateway SA selection.

Gateway call selection is hardware oriented with various selection criterion being trunk type (i.e., R1, N5 etc.), trunk group clli, or particular circuit. The ability to select gateway trunks for service analysis is available through the entering the GWsel map level from the common base service analysis SASelect level.

Invoking Gateway Service Analysis.

The common base service analysis level (i.e., SA level) which begins the service analysis process may be entered from either the SASelect or the GWsel levels by entering the command GWSA.

Gateway Quota display and reset level.

The ability to display the current quotas and totals for the number of gateway trunks analyzed is available from the GWsel level by entering a new map level - the Quota level.

Recording SA Call Detail Recording.

The ability to specify whether the CDR record for the call should be marked as service analyzed or not is via the Record command from the GWsel map level.

Further details of the DMS 300 SA can be found in NTP 297-2301-470 and 297-2301-471 (DMS 300 SA description and DMS 300 SA MMI respectively).

Package	NTX065AA10 SERVICE ANALYSIS
Feature set	ADMINISTRATION
Feature	AOSS SERVICE ANALYSIS
Feature no	F3707

FEATURE SYNOPSIS

This feature enables the Telco to service analyze calls on intertoll, TOPS and AOSS trunks that route to AOSS positions.

FEATURE DESCRIPTION

AOSS calls fall into two general categories which can be selected individually or together for analysis:

- a) DA - includes 411, HOM 555, FOR 555 and 131 call types
- b) INT - intercept calls

The CRT display in the DMS 200 MAP provides the access for service analysis. When the service analysis mode is selected, this will present a menu on the CRT, listing the TOPS layout and a select (SASelect) table. For AOSS, level 4 is designated and when '4' is keyed in (listed against DirAsst) the AOSS menu is presented.

This menu again would contain a select table giving the selection code for DA, INT and DA + INT calls. The desired code is keyed in for a display of a particular AOSS call, which will feature the DA data and a select table.

The system presents a call selected randomly of the desired type and a hard copy printout can be obtained from MAP TTY by choosing the appropriate select code against 'PRINT'. Once complete, the select code is used either to 'QUIT' or choose another call.

Hard copy print has to be obtained when still on the SA or 5A Edit level.

Package	NTX065AA10 SERVICE ANALYSIS
Feature set	ADMINISTRATION
Feature	SERVICE ANALYSIS FOR ATC TRUNKS
Feature no	G0070

Synopsis

Service Analysis (SA) is an observation system used by the operating company to assess quality of service. This feature adds calls originating on Access Tandem Connection (ATC) trunks to SA. The operating company can use this information to improve service to the end-user.

Accessing SA features through the Service Analysis Position (SAP), presents various types of calls to the position at random for evaluation. The call data are then analyzed by the clerk to assess the quality and completeness of service offered to subscribers.

Implementation

The DDDIN (Direct Distance Dialing Inward) command from the SASELECT level of the MAP now presents calls from ATC trunks as well as calls from IT (InterToll) trunks for analysis.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF1253

NTX066AA02 Status: RTM BILINGUAL INTERFACE

INTERFACES	:	
BILINGUAL INTERFACE		F0691
VARIABLE LANGUAGE BMMI		F4495

Package	NTX066AA02 BILINGUAL INTERFACE
Feature set	INTERFACES
Feature	BILINGUAL INTERFACE
Feature no	F0691

DESCRIPTION

The DMS-100 bilingual man-machine interface (BMMI) is capable of operating in either English or another language (currently French). A bilingual system is one in which each terminal user may select the language of preference. Selection of the operable language will be by MAP command on a per terminal basis for the bilingual system.

The MAP terminal keyboard can be modified to provide bilingual designations. All descriptive messages will be translated and will be resident in the machine in both languages with a distinct possibility of having the second language data resident on disk. The abbreviated DM (Data Modification Order) type commands will remain unchanged.

The purpose of the BMMI feature is to allow Telco personnel to communicate with the DMS-100 Family of exchanges in English and another language (French initially). Translations are provided as data input during load building.

Telco personnel will be able to activate this feature and use either language concurrently from any I/O port of the switch.

Input commands and output MAP responses is in the chosen language. ACRO-NYMS, Data Table Names and Associated Field Names will not be translated.

The BMMI is an optional feature - offices not requiring it are not penalized by any additional memory storage requirements.

Delays incurred in the MAP responses and updates with the BMMI feature activated do not exceed 0.5 seconds in 90% of all cases.

The activation of this feature does not impact adversely any switching functions of the DMS-100.

NTX072AA01 Status: RTM INTERNATIONAL DIRECT DISTANCE DIALLING (

DIALING AND DIALING PLAN	:	
COUNTRY CODE SCREENING (U.S)		F1030
INTERNATIONAL ROUTING TRANSLATION (U.S)		F1031
PREMIUM DIALLING (01+) (U.S)		F1032
STATION TO STATION (011+) (U.S)		F1033
2-STAGE OUTPULSING TO GATEWAY (U.S)		F1034

Package	NTX072AA01 INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
Feature set	DIALING AND DIALING PLAN
Feature	COUNTRY CODE SCREENING (U.S)
Feature no	F1030

DESCRIPTION

STATION TO STATION -----

SUBSCRIBER DIALS 01 + COUNTRY CODE + NATIONAL NUMBER DMS ANALYSES THE 01 INTERNATIONAL PREFIX

PREMIUM DIALLING -----

SUBSCRIBER DIALS 011 + COUNTRY CODE + NATIONAL NUMBER DMS ANALYSES THE 011 INTERNATIONAL PREFIX

COUNTRY CODE SCREENING -----

DMS CHECKS ALL THE VALID INTERNATIONAL COUNTRY CODES. INVALID CODES ARE GIVEN VACANT CODE TREATMENT.

INTERNATIONAL ROUTING TRANSLATION -----

DEPENDING ON THE COUNTRY CODES, DMS ROUTES INTERNATIONAL CALLS VIA CAMA TRUNK GROUP TO THE TOLL OFFICE OR GATEWAY AND OUTPUTS DIGITS USING TWO STAGE OUTPUTSING.

TWO STAGE OUTPUTSING TO GATEWAY ----- THE FIRST STATE OUTPUTSING ON RECEIPT 0+ THE FIRST WINK SIGNAL WILL BE OF THE FORMAT KP + 1XX + ST OR

KP + 001 + XXX + ST

WHERE 1XX IS THE GATEWAY CODE
011 IS THE INTERNATIONAL IDENTIFIER
XXX IS A COUNTRY CODE AUGMENTED TO THREE DIALS

THE KP + XXX + ST FORMAT IS EMPLOYED WHEN DMS TOPS SELECTS THE GATEWAY ON THE BASIS AT COUNTRY CODE TRANSLATION. THE KP + 011 + XXX + ST FORMAT IS EMPLOYED WHEN GATEWAY SELECTION IS TO BE MADE ???.

OTHER TOLL SWITCHERS IS THE DDD NETWORK. THE FIRST STAGE MAY BE OMITTED IF DMS TOPS HAS DIRECT TRUNKS TO THE GATEWAY SWITCH.

THE SECOND STAGE OF OUTPUTSING IS OF THE FORMAT KP + CC (OR PCC) + NN + ST AND IS TRANSMITTED END TO END TO THE GATEWAY OFFICE UPON RECEIPT OF THE SECOND WINK OR DELAY DID SIGNAL. PSEUDO COUNTRY CODE (PCC) IS EMPLOYED

WHEN THE CALL IS OPERATOR ASSISTED TO INFORM THE GATEWAY OFFICE TO SELECT AN APPROPRIATE LANGUAGE DIGIT.

Package	NTX072AA01 INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
Feature set	DIALING AND DIALING PLAN
Feature	INTERNATIONAL ROUTING TRANSLATION (U.S)
Feature no	F1031

SEE FEATURE NUMBER F1030

Package	NTX072AA01 INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
Feature set	DIALING AND DIALING PLAN
Feature	PREMIUM DIALLING (01+) (U.S)
Feature no	F1032

SEE FEATURE NUMBER F1030

Package	NTX072AA01 INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
Feature set	DIALING AND DIALING PLAN
Feature	STATION TO STATION (011+) (U.S)
Feature no	F1033

DESCRIPTION

Station to Station

Subscriber dials:
01 + country code + national number
DMS analyses the 01 international prefix

Premium Dialing

Subscriber dials:
011 + country code + national number
DMS analyses the 011 international prefix

Country Code Screening

DMS checks all the valid international country codes. Invalid codes are given vacant code treatment.

International Routing Translation

Depending on the country codes, DMS routes international calls via CAMA trunk group to the toll office or gateway and outpulses digits using two stage outpulsing.

Two Stage Outpulsing to Gateway

The first state outpulsed on receipt 9+ the first wink signal will be of the format KP + 1XX + ST or KP + 001 + XXX + ST

where: 1XX is the gateway code
011 is the international identifier

XXX is a country code augmented to three dials

The DP + XXX + ST format is employed when DMS TOPS selects the gateway on the basis at country code translation. The KP + 011 + XXX + ST format is employed when gateway selection is to be made ???.

Other toll switchers is the DDD network. The first stage may be omitted if DMS TOPS has direct trunks to the gateway switch.

The second stage of outpulsing is of the format KP + CC (or PCC) + NN + ST and is transmitted end to end to the gateway office upon receipt of the second wink or delay DID signal. Pseudo country code (PCC) is employed when the call is operator assisted to inform the gateway office to select an appropriate language digit.

Package	NTX072AA01 INTERNATIONAL DIRECT DISTANCE DIALLING (IDDD)
Feature set	DIALING AND DIALING PLAN
Feature	2-STAGE OUTPULSING TO GATEWAY (U.S)
Feature no	F1034

SEE FEATURE NUMBER F1030

NTX074AA06 Status: RTM DISK DATA STORAGE SYSTEM

FACILITIES	:	
LOADING/UNLOADING OF OFFICE IMAGE NON-RES		F1130
DATA RECORDING AND RECALL	OPERATIONAL MEASUREMENTS	F1131
DATA RECORDING AND RECALL	AUTOMATIC MESSAGE ACCOUNTING	F1132
DATA RECORDING AND RECALL	LOG FILE	F1133
DATA RECORDING AND RECALL	JOURNAL FILE	F1134
PENDING ORDER FILE ON DISK		F1135
DISK STORAGE OF PERIPHERAL LOADS		F1226
ADMINISTRATION	:	
ENHANCED DISK MNTCE		F1463
INTERFACES	:	
14 INCH WINCHESTER DISK DRIVE		F2279
ADMINISTRATION	:	
DDU IMAGE VOLUME SIZE INCREASE		F2792
150 MB DISK SUPPORT		F3320
SEMI AUTOMATIC DIRP DISK TO TAPE COPY		F3742
MAINTENANCE AND TESTING	:	
AUTOMATIC IMAGE DUMP		F7117
FACILITIES	:	
DISK SOFTWARE REWRITE - PHASE 2		F7216

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	FACILITIES
Feature	LOADING/UNLOADING OF OFFICE IMAGE NON-RES
Feature no	F1130

DESCRIPTION

The Disk Drive will be used to replace the tape drive for Office Image storage for bootstrap loading. It is most probable that the time required to dump the image each day would be significantly reduced, because rewinds and human interaction to mount tapes would be eliminated, and, if sufficient disk space is available, the previous Image File (and Journal File) could be retained. In addition, the reloading of an office image should be faster, because transfer rates will be significantly faster.

The disk drive will also provide quicker access to the PM loads in DMS.

Coupled with the capability of data transmission in the system, the disk capability can be further extended to provide remote software loading and update in regular or emergency situations.

Package	NTX074AA06 DISK DATA STORAGE SYSTEM		
Feature set	FACILITIES		
Feature	DATA RECORDING AND RECALL	OPERATIONAL MEASUREM	
Feature no	F1131		

DESCRIPTION

a) Storage of AMA and OM Data

Currently AMA data is written on tape, utilizing not only the tape drive which it is writing to, but also requiring hot-standby drive(s). OM data also uses another drive so that together they require 3 or 4 drives when in full operation. Installation of a disk system, with the number of drives dependent on the total storage required, would significantly reduce the number of tape drives required in a DMS-100 office.

As mentioned above, the number of disk drives which would be required depends on office parameters such as office type, or number of trunks and lines. For example, OM volumes are small for certain office types, and AMA data volumes depend on the number of trunks, and the degree of activity locally. Operational Measurement data volumes for a 20K DMS-200 office is estimated to be about 1.5 MBytes daily, which would then be transmitted and kept on file for 3 days of data backup. This means that the storage of up to 3 days of data would require approximately 4.5 MBytes of disk space. The volumes of AMA data generated is basically dependent on the number of trunks monitored and their overall level of activity, but, as a rough estimate, 1000 trunks would produce between 4.4 MBytes (w/o TOPS) to 4.9 MBytes (with TOPS) per day. Allowing a 30% additional volume for incomplete call option, this results in a 5.75 to 6.25 MBytes per day per file. Total disk volume depends on the requirements for duplexing, and the number of days of data which must be retained on the switch. For example, 3 days full duplexed would need 34.5 to 37.5 MBytes of disk storage allocated to AMA.

However, the significant fact in converting to disk is that a disk drive's storage space can be used by several activities, as well as storing historical or backup data. In contrast, the total resource of a tape drive is dedicated to recording one activities output or storing some information for later use, while standing by in an idle state. Moreover, the utilization of a disk drive's resources requires much less human interaction than that of tape drives.

b) Automatic Remote Transmission of AMA/OM Data

Utilizing the disk system for storage of AMA/OM data allows for the automatic switching of files on a periodic basis and remote activation of the switch for transmission of this data to central collection facilities via Datapac/Telenet networks.

Package	NTX074AA06 DISK DATA STORAGE SYSTEM		
Feature set	FACILITIES		
Feature	DATA RECORDING AND RECALL	AUTOMATIC MESSAGE AC	
Feature no	F1132		

FEATURE SYNOPSIS

Currently AMA data is written on tape, utilizing not only the tape drive which it is writing to, but also requiring hot-standby drive(s). OM data also uses another drive so that together they require 3 or 4 drives when in full operation. Installation of a disk system, with the number of drives dependent on the total storage required, would significantly reduce the number of tape drives required in a DMS-100 office.

Utilizing the disk system for storage of AMA data allows for the automatic switching of files on a periodic basis and remote activation of the switch for transmission of this data to central collection facilities via Datapac networks.

FEATURE DESCRIPTION

Package	NTX074AA06 DISK DATA STORAGE SYSTEM		
Feature set	FACILITIES		
Feature	DATA RECORDING AND RECALL	LOG FILE	
Feature no	F1133		

DESCRIPTION

The preset DMS will allow the recording of log messages on magnetic tape on an optional basis. This option will be extended to allow the recording of log messages on disk in order to facilitate transmission of log data to a remote location.

Package	NTX074AA06 DISK DATA STORAGE SYSTEM		
Feature set	FACILITIES		
Feature	DATA RECORDING AND RECALL	JOURNAL FILE	
Feature no	F1134		

DESCRIPTION

The optional Journal File feature provides the facility to record activated Data Modification Orders (DMOs) and Service Orders for backup purposes in the event that the contents of the data tables are inadvertently destroyed. If a switch failure occurs, a reload of the office is initiated and the Journal File transactions are applied to restore the tables to their state prior to the failure.

Typically, there are very few entries, less than 2000, written to a Journal File between the creation of a new office image, so that the maximum amount of data written to a file would be less than 200K Bytes. Since a magnetic tape is presently used as the storage device for the Journal File a entire tape drive is dedicated to this function while Journalling is active. By utilizing disk storage for this purpose, only single file space, or even two file spaces duplexed for loss protection, would be tied to this function while the disk drive was active serving as storage for other software features.

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	FACILITIES
Feature	PENDING ORDER FILE ON DISK
Feature no	F1135

DESCRIPTION

The Pending Order System is an optional feature which currently stores records in its files in DMS Data Store. The Pending Order Files (POFs) are used to store service orders, rating changes, office reconfiguration changes, and any other changes which can be effected using the Table Editor. These Table Editor commands are input to POFs for activation at a later time.

The disk system could be used to store these POFs outside of DMS memory while awaiting activation. These files are usually not large and their size is dependent strongly on the office type, with the largest requirements in the larger local offices. Weekly volumes could range from 5K to 10K words of storage, but occasional 'block-out' change procedures could require up to 5 times this amount. The advantage of the disk resident files would be, not only to free that amount of data store for other uses, but to permit entry of larger volumes of table changes further in advance of their scheduled implementation.

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	FACILITIES
Feature	DISK STORAGE OF PERIPHERAL LOADS
Feature no	F1226

FEATURE SYNOPSIS

The disk drive can replace the tape drive for Office Image loading and dumping. The time required for either loading or dumping is reduced because of higher transfer speeds and direct positioning capabilities i.e. rewinds and file searches are eliminated. Also, since human interaction is minimized, the possibility of human error is effectively eliminated.

The over-all security of the DMS is enhanced significantly since now each disk drive can store one or more copies of the Office Image, each of these can be used during system initialization.

FEATURE DESCRIPTION

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	INTERFACES
Feature	14 INCH WINCHESTER DISK DRIVE
Feature no	F2279

DESCRIPTION

a) Disk Controllers

The Disk Controller (NT1X55) is a single circuit pack, capable of interfacing the Pertec or Priam drives. Unique firmware will be required for each model of disk drive. Each controller will be capable of simultaneously controlling two drives of the same make. The controller will provide 11-bit burst-error correction on data blocks of 1 Kilobyte by appending a 32-bit redundancy check, calculated by hardware on the controller, to the data blocks written on the disk.

The 1X55 may plug into any available card location on the IOC shelf, provided that external cabling has been supplied. Total logic cable from the controller to the furthest drive currently must not exceed ten feet (10'). A study is underway to determine if this restriction can be relaxed to fifteen feet (15').

The controller will operate in three major modes. The first or initialization mode is used to format the disk drives under its control into defined volumes or initialize a volume space (see Physical File section). The second mode would be its normal operating mode in which it performs the required I/O operation requested by the disk software. The third mode of operation is called 'Boot Mode'. In this mode the controller would locate the Office Image file on receipt of a 'Boot Start' command. This Image file would be either the default office image last created or an alternate file named in a BOOTMATE command. The controller would read further records as long as it receives a 'Boot Continue' message, or reset to normal mode on receipt of any other command.

Power Supply

The drives require only DC power, which will be obtained from the FSP. Power converters (NT1X78), designed especially for the disk system, are provided on a per drive basis.

Each converter will draw power from separate -48V sources on the FSP, so that each drive will be independently powered to the extent possi-

ble. The converter will output four voltages of +24V, +5V, -5V, and -12V to its drive unit.

b) Disk Maintenance Software

The disk system will be supported by a maintenance software package which will provide several facilities to ensure the viability of this storage medium.

From the MAP position, maintenance software would allow the operator or service personnel to display the status of a disk drive, to busy, return to service, test or place offline a disk controller, and to enter commands to format a disk unit. This software would be an increment of the IOC software, and be fully integrated in the Optimized Maintenance Subsystem for I/O peripheral device handlers. When initially adding disk to the DMS-100, the Table Editor, interacting with the maintenance software, would be used to add the units to the system, at which time the volumes defined for each controller would be established. The software, in conjunction with the controller firmware, would ensure that this information would survive all re-starts, making all volumes reaccessable in the event of reloads. Thus, no disk drive would be able to be brought into service prior to being formatted in this fashion. These logical volumes would then be further formatted through the PFS.

Through the use of periodic audits, the maintenance software would attempt to ensure the sanity of the disk controller and drive. These audits would monitor the operational status of the devices through the testing features implemented in the controller, such as, I/O bus loopback tests, reserved sector read tests, volume map integrity checks, etc., through the computation of inaccessible sector ratios, and through tests of the logical and physical file systems, by the creation, writing, reading and deletion of test files on a per volume basis. The software would raise a major alarm if the sanity of the device appears not to be ensured, if the operational parameters of the disk degrade below critical levels, or if the controller alerts the maintenance software of a failure in a disk system component.

A further capability of the audit process would be to check-point the open files in each volume, by updating the disk resident file control block from the memory resident copy. This would ensure that data lost in the event of a restart would not exceed that collected between audit cycles.

c) Disk Physical File System

The disk space on a DMS-100 is initially defined in terms of volumes, each of which has its own set of files. There are three restrictions on the definition of the volumes:

1. The number of unique volumes cannot exceed 32.
2. No volume may span drives, and each volume may contain at most 65536 blocks.
3. All volumes defined under a particular disk controller must be defined together, that is, if more volumes are added to a controller the entire space under its control is re-initialized and any data previously written there will be lost.

The files within a volume are accessed as logical files. The physical file system accesses data within a file by block number which the disk controller translates into a disk track/sector address. The PFS does not maintain any knowledge of where a file is stored within a particular disk controller's space other than the volume number. Processes using disk space will open the file through the logical file system which will return a File Reference Number for the file. All subsequent activity uses this number to get, put, or delete a record or delete, extend, or close the file. If a process using a disk file traps or dies, the PFS will be informed and the file will then be closed, unless it is shared with an active process.

d) Reliability

To ensure accessibility of and loss protection for critical data, certain schemes for utilizing disk storage would be recommended. For example:

- at least one tape unit would be required in an office for importing of office image updates, and could act as a backup bootstrap device if the assigned disk failed.
- if two disk units are equipped, they would be connected to separate controllers on separate IOCs; subsequent units could share a controller with an existing unit to a maximum of 2, before additional 1X55 packs would be required.
- critical data would be duplexed, i.e., written to duplicate files on separately accessible units.

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	ADMINISTRATION
Feature	DDU IMAGE VOLUME SIZE INCREASE
Feature no	F2792

FEATURE SYNOPSIS

This feature increases the maximum Input/Output Controller disk volume size to 64 Megabytes (less 1k).

FEATURE DESCRIPTION

This feature makes it possible to create larger disk volumes.

Increasing the disk volume size provides an increase in the maximum number of disk blocks per file, and the maximum number of disk blocks per volume.

Ref: FDOC BR0792

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	ADMINISTRATION
Feature	SEMI AUTOMATIC DIRP DISK TO TAPE COPY
Feature no	F3742

FEATURE DESCRIPTION

The purpose of this feature is to supply a simplified technique for copying Unprocessed DIRP disk files to tape and to make the DIRP MMI more 'user friendly'.

The original intent of DIRP included disks solely for the purpose of automatic transmission. A primitive facility (DIRPCOPY) was provided in the event that a file could not be transmitted. As a subsequent cost reduction, disks were introduced into the general central office environment as a replacement for magnetic tape drives. This also facilitated more flexible and sophisticated recording possibilities. (Shared devices and boot capability).

The DIRPCOPY facility was designed as a backup mechanism to copy files to tape in an emergency situation, and as such, is limited and cumbersome for everyday use. In particular, the long DIRP filename along with emergency rotates, make it difficult to identify exactly what needs to be copied.

This feature supplies a new CI command (DIRPAUTO) to simplify this daily copy operation. The command is relatively simple to use, and it can be executed from any MAP level. This command uses a maximum of 2 parameters, with defaults established for AMA which require no parameters.

The format of the command is:
DIRPAUTO <ssys> <n>

Where:

More information is available in the MM section.

The other major change associated with this feature is the log information supplied as a result of parallel file activity. A need has been identified which would allow the craftsperson to copy a subset of the parallel file to a regular DIRP file. This will make the downstream processing a little easier, as the copied file should now contain an exact duplicate of what would have been on the active file.

In general, any special I/O activity will now trigger extra logs to be generated. (As a result, the DIRP log buffer has been increased by a factor of about 2.5 to help ensure that relevant data is available when required).

This feature introduces a new (minor) alarm to the DIRP and IOD alarm displays to identify this type of emergency. It is in addition to the user

defined alarm levels, which take precedence. This alarm is set on any reload restart and on any emergency rotate.

1) Doing a DIRPCOPY and specifying more blocks than exist on the file will cause the file to be rewound and the copy to continue until the block count is satisfied. This is useful when trying to retrieve parallel data which experienced a parallel rewind while recording the active data. Thus, if an active file starts recording with the parallel positioned near the end of the file, and the parallel rewinds before the active is complete, then it will be possible to recreate the entire active file using this 'wraparound' feature of DIRPCOPY. In the past, 2 passes of DIRPCOPY were required, creating 2 files, thus splitting the active.

2) In the current system, with many standby files, the date of the file would be a couple of days old by the time the file made it to the active position. This affects the calculated retention period and made it difficult to associate a filename with the actual dates of the internally recorded data.

A new field has been added to table DIRPSSYS which allows the user to have the system automatically re-date the file as desired. (Note that this works for disk only, as tape files can't be renamed safely). This field is called FILEDATE, and has 4 possibilities to meet varying telco needs:

3) A log warning is now produced should a file be made active which has already been active before. This occurs when the active file is rotated and never closed and then makes it back to the active position. This situation requires special attention by some downstream systems.

4) Processed files will no longer be added to table DIRPHOLD. DIRP makes no use of this information to erase files, as more than 100 files can exist. Instead, DIRP scans the disk to determine the oldest files for erasure.

This will help to remove some of the clutter from this table. Table DIRPHOLD will now only hold Unprocessed files, files recovering from a reload, and files added manually. (Manually added files are only referenced by remote data polling systems). 'A' files, recovering from a reload, will eventually become Unprocessed.

5) This feature will now permit the active file to be closed, even if standby(s) exist behind it. The system will do an automatic rotate, if necessary, after prompting for confirmation. (The old system used to require a manual ROTATE, a search for the file, and finally a CLOSE command). Current file security is not compromised.

6) A new field has been added to table DIRPSSYS which will cause the system to automatically close a file after completing a rotate. This field is called ROTACLOS and has 4 possibilities. File security is not compromised.

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	MAINTENANCE AND TESTING
Feature	AUTOMATIC IMAGE DUMP
Feature no	F7117

FEATURE SYNOPSIS

This feature allows Central Control (CC) image dumps to be taken automatically without user intervention. The Operating Company can schedule dumps at its convenience. The process dumps the image to a user defined storage device.

FEATURE DESCRIPTION

To allow the Operating Company to schedule the image dump, Table IMGSCHEDE is used to track the day and time. Table IMGSCHEDE has a maximum size of seven tuples. These tuples correspond to the seven days of the week. Each tuple consists of four fields: the day, called DAY; time, called DUMPHOUR and DUMPMIN; and an active boolean, called ACTIVE.

To allow the AUTO-IMAGE process to rotate through selected devices, Table IMAGEDEV is used to contain the volume names. Table IMAGEDEV has a maximum size of three tuples. These tuples correspond to the load routes A, B, and C. Each tuple in IMAGEDEV consists of two fields: the volume name, called VOLNAME; and an active boolean, called ACTIVE.

Commands exist to turn the AUTO-IMAGE dump process on or off, to query the status of the AUTO-IMAGE dump process and display the next scheduled dump time, to display output messages and other information regarding the last image dump attempt, and to stop currently executing image dumps.

Ref: FDOC AG1043

Package	NTX074AA06 DISK DATA STORAGE SYSTEM
Feature set	FACILITIES
Feature	DISK SOFTWARE REWRITE - PHASE 2
Feature no	F7216

Synopsis

This feature improves the DMS-100 disk drive system. The possibility for disk corruption is reduced, the disk allocation utility is improved, and return-to-service (RTS) time is reduced.

RTS time for IOC disks after a cold or warm restart is reduced from an upper bound of seven minutes to an upper bound of approximately three minutes. Average RTS time is reduced by one third. This reduces the amount of billing information lost during restarts.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AL0928

NTX076AA01 Status: RTM AMA - ENHANCED

NUMBER IDENTIFICATION/CHARGING :
TRUNK IDENTIFIER IN AMA/SMDR RECORD

F0569

Package NTX076AA01 AMA - ENHANCED
Feature set NUMBER IDENTIFICATION/CHARGING
Feature TRUNK IDENTIFIER IN AMA/SMDR RECORD
Feature no F0569

DESCRIPTION

This feature allows the operating company to record the incoming and outgoing trunk identifiers along with the usual billing information now provided by the AMA or SMDR system.

Activation of the feature is via the OFCPARMS table. The entry 'AMA_TERMINAL_ID' when set to TRUE will result in an extension entry being generated for each billing entry. This extension entry contains the numerical identifiers for the trunk group and trunk number in group of both the trunk circuits involved in the call.

In order to convert the numerical identifiers to external identifiers (i.e., the CLLI) a data table is output when the tape is mounted as an AMA or SMDR tape. Data is formatted in 2048 byte blocks with a unique block header record.

The block header record is similar to the AMA/SMDR call record block header but contains additional information regarding the format of the data and the logical record length. At the end of the data dump, a dump termination record is output.

NOTE: (i) This feature is applicable to DMS-200 incoming CAMA trunks and DMS-100 SMDR tie trunks.

(ii) With this feature also comes the removal of the first file on the tape (i.e., the format file) which is currently always empty.

(iii) The first logical record on the tape is no longer the incoming transfer 'FA'. On mounting the tape the data table is output and only after it is assigned does it become available for call recording.

Package	NTX077AA01 ONLINE PERIPHERAL SOFTWARE
Feature set	CUSTOMER SERVICES
Feature	PM LOADS IN MAIN MEMORY
Feature no	F2331

DESCRIPTION

This feature will allow PM S/W loads to be kept in the protected area of main memory, rather than on a magnetic tape. It is primarily intended for unmanned offices equipped with single magnetic tape drive for office image. However, any office with PM S/W < 6.5 64K words in size can be equipped with this feature in order to take advantage of increased speed of loading as well as to free up an MTD drive for other purposes.

NTX080AA02 Status: RTM LAMA ENHANCED

NUMBER IDENTIFICATION/CHARGING :

INWATS RECORD ON AMA TAPE

F2258

INDIVIDUAL LINE BILLING ON INWATS CALLS

F2500

Package	NTX080AA02 LAMA ENHANCED
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	INWATS RECORD ON AMA TAPE
Feature no	F2258

DESCRIPTION

Inward Wide Area Telecommunication Service (INWATS) allows a subscriber to receive calls originated within specified service areas without a charge to the originating party. The feature will place all INWATS calls terminating in the (Local or combined, LAMA equipped) office onto AMA tape. The calls recorded can be classified as follows:

- i) Completed/answered
- ii) Ring, no answer
- iii) Blocked, busy condition encountered

There are two aspects to this feature:

- a) An In-Switch Interface
- b) AMA Records on Tape.

In-Switch Interface

This is an engineering office parameter, named INWATS_ON_AMA, is a boolean that turns the feature on and off. It can be altered without a restart.

AMA Records on Tape

The AMA record is identical to the LAMA record (see NTP 297-1001-119N) with the following exceptions:

- The called digits are the digits of the INWATS line that was terminated on. The last four (dialed) digits are preserved, while the NPA NXX digits have been filled in from the datafill for the INWATS line. This is done because on an INWATS call only the last four digits can be considered valid for the line, the other digits received (if any) are control digits to block any other call from terminating on the INWATS line inadvertently. For example, if a local office contained the NXX's 829, 838, 839 an INWATS call might be given the control digit 5 (i.e. 5-XXXX). This would ensure that no normal call would be routed to the INWATS terminator, because no normal call would use a 5 as its C digit.

- The calling digits (if any are recorded) are the special billing number digits associated with the called line. This is done because in most cases (99⁴) the calling party digits are not known. (They are only known in the combined office case where the call originates in the office)
- The event information digit can also be the number 6. The meanings associated with this digit are:
 - 0 - answered, calling disconnect.
 - 1 - answered, called disconnect.
 - 2 - unanswered, unblocked. (ring, no answer)
 - 8 - blocked. (busy or other treatment)
- The entry code will be the one associated with the INWATS line, via the charge class in the LINEATTR table.
- The record format code will be F5.
- The feature code digits will always be 0.
- ANI fail or ONI conditions will never be indicated.

Package	NTX080AA02 LAMA ENHANCED
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	INDIVIDUAL LINE BILLING ON INWATS CALLS
Feature no	F2500

FUNCTIONAL DESCRIPTION

This option will allow billing to either the actual INWATS line terminated on or the dialled DN of the INWATS Directory Number Hunt (DNH) group. The decision was made to implement this feature as a hunt group option. This means that the option must be added on a hunt group basis, to the pilot dn of the hunt group. Once the pilot dn of the hunt group has the option to bill to the number terminated on, each call to this DNH will be billed to the dn on which the call terminated.

The implementation of the option required the addition of a field to the HUNTGRP table. This field is called the TYPE_OF_TERMINATOR_BILLING (or TRMBILL) field and can take the following values: RCVD, TERM, and PILOT.

These values have the following meanings:

RCVD	Billing will be to the digits received by the terminating office. This is the type of billing that was in place before the inception of this option, and will therefore be the default value for the field TRMBILL.
TERM	Billing will be to the directory number of the line on which the call terminated.
PILOT	Billing will be made to the pilot dn of the DNH in which this call terminated. This will, in general, be the same dn as the digits received by the terminating office, but may be different in some cases.

The default value is RCVD which will cause the same records as before to be printed. Please refer to the Man Machine Interface section of this document for information on how to change the value of this field.

NTX080BA01

Status: RTM TERMINATING CALL BILLING(NT FORMAT)

NUMBER IDENTIFICATION/CHARGING :
BILLING ON TERMINATING CALLS TO A LINE

F2520

Package	NTX080BA01 TERMINATING CALL BILLING(NT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	BILLING ON TERMINATING CALLS TO A LINE
Feature no	F2520

FEATURE SYNOPSIS

Feature is required to enable AMA recording of all calls terminating to a specified line. This feature may be used with either NT AMA format or AT&T AMA format.

Package	NTX080CA01 TERMINATING CALL BILLING(ATT FORMAT) (REP.BY NTX08
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	BILLING ON TERMINATING CALLS TO A LINE
Feature no	F2520

FEATURE SYNOPSIS

Feature is required to enable AMA recording of all calls terminating to a specified line. This feature may be used with either NT AMA format or AT&T AMA format.

NTX081AA01 Status: RTM AMA SPECIAL FORMAT

NUMBER IDENTIFICATION/CHARGING :
EBCDIC RECORDING

F2287

Package	NTX081AA01 AMA SPECIAL FORMAT
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	EBCDIC RECORDING
Feature no	F2287

DESCRIPTION

The AMA information is recorded using variable AMA entries in a fixed data block of 2048 bytes. The standard coding of AMA information is BCD because of the efficient utilization of magnetic tape. An option is provided to record the AMA data in similar data format but using ER CDC coding on tape for operating companies who prefer to process AMA data in EBCDC. This option enables the recording of trunk identification information, all TOPS data if appropriate, as well as the regular AMA data in EBCDC coding.

NTX082AA01 Status: RTM SUBSCRIBER LINE MEASUREMENTS

ADMINISTRATION	:	
SUBSCRIBER LINE USAGE REGISTERS		F0090
SUBSCRIBER LINE PEG COUNT MEASUREMENT		F2268
OM - DMO SELECTIVE SLU SCAN INTERVAL		F2361

Package	NTX082AA01 SUBSCRIBER LINE MEASUREMENTS
Feature set	ADMINISTRATION
Feature	SUBSCRIBER LINE USAGE REGISTERS
Feature no	F0090

DESCRIPTION

With this feature, the telco will be able to assign registers to measure usage on particular subscriber lines.

The maximum number of lines to be measured is specified by the telco up to a maximum of 1140. Line selection will be on:

- a) individual line basis
- b) line module basis

Usage measurements will be taken on a 100 second scan basis and will consist of the sum of the originating and terminating traffic.

Package	NTX082AA01 SUBSCRIBER LINE MEASUREMENTS
Feature set	ADMINISTRATION
Feature	SUBSCRIBER LINE PEG COUNT MEASUREMENT
Feature no	F2268

DESCRIPTION

This feature provides an addition to the subscriber line usage register feature at the same time as assigning a usage register, two peg count registers will be assigned, one each to count originating and terminating attempts. The number of lines to be measured will be specified by the customer up to a maximum of 1140. Line selection will be made by:

- a) individual line basis
- b) line module basis

The originating counters will accumulate an event upon connection to dial tone to originating subscriber. The terminating counters will accumulate an event upon application of ringing on a terminating call.

Package	NTX082AA01 SUBSCRIBER LINE MEASUREMENTS
Feature set	ADMINISTRATION
Feature	OM - DMO SELECTIVE SLU SCAN INTERVAL
Feature no	F2361

FEATURE SYNOPSIS

This feature enables the Telco personnel to change the scan rate of monitoring the line/lines which registered under any of the four OM SLU measurement tables:

ENG640 ml
TRA250 ml
TRA125 ml
TRA125 m2

The scanning rate is DMO selectable as an unassigned integer (0 to 65000) in 10 second units. Values of 1 and 10 are used to obtain scanning rates of 10 and 100 seconds.

FEATURE DESCRIPTION

Package	NTX083AA01 FEATURE GROUP A(UPG. OF NTX083AA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	BILLING ON TERMINATING CALLS TO A LINE
Feature no	F2520

FEATURE SYNOPSIS

Feature is required to enable AMA recording of all calls terminating to a specified line. This feature may be used with either NT AMA format or AT&T AMA format.

Package	NTX083AA01 FEATURE GROUP A(UPG. OF NTX083AA)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	FGA TERMINATING RECORD
Feature no	F2768

FEATURE SYNOPSIS

This feature provides an AMA record for a terminating feature group A call. A record with call code 132 is generated when the call is answered by the called party.

FEATURE DESCRIPTION

Feature group A (FGA) provides line-side access to end office switches with an associated 7 digit telephone number. A subscriber to FGA service dials the number, receives dial tone from the caller, identifies himself and dials the desired long distance number. This is the originating FGA call which produces previously implemented originating FGA AMA record with call code 131.

The carrier then originates a call to complete the subscriber's long distance call. This is FGA terminating call for which an AMA record with call code 132 is produced per this feature. Please note that if, to complete the long distance call, the FGA carrier has to originate a FGD (equal access) call, two AMA records are produced: one with call code 110 and one with call code 132, and they are identical (structure codes 625 or 627).

Ref:

NTP 297-1001-128 AMA Reference Manual - Bellcore Format
BF0768 FDOC

NTX085AA05 Status: RTM TRAFFIC SEPARATION PEG COUNT

ADMINISTRATION	:	
TSMS PEG COUNT SOURCE AND DISPOSITION UP TO 128		F1219
EQUAL ACCESS END OFFICE(EAEO)	:	
EAEO TSMS CARRIER OVFL PC		F1735
ADMINISTRATION	:	
TSMS PEG COUNT ON IBN		F2464
TSMS PDAB/PDTP PEG COUNT		F2484
EAEO - PEG COUNT		F3737

Package	NTX085AA05 TRAFFIC SEPARATION PEG COUNT
Feature set	ADMINISTRATION
Feature	TSMS PEG COUNT SOURCE AND DISPOSITION UP TO 128
Feature no	F1219

FEATURE SYNOPSIS

This is an extension of the basic traffic analysis feature (F1218) and allows for considerably more point to point OM pegcounts for the three call types: direct dial (DD), operator assisted (OA), and no prefix (NP).

This feature is implemented by the TFAN_ENCHANCED_FEATURE OFCPARM and allows for the extension of the matrix to a maximum of 2047 intersection. (OM Registers). The inputs (sources) can be 16,32,64 or 128 and are defined by the trunk group and line attribute data tables. The outputs (destinations) can be 16,32,64 or 128 and are defined by the four data tables: Trunk Group, Line Attribute, Tones and Announcements.

To avoid confusion traffic separation numbers 1 & 2 are reserved in all offices, number 3 in CAMA/TOPS and numbers 4,5 & 6 in local offices.

FEATURE DESCRIPTION

Package	NTX085AA05 TRAFFIC SEPARATION PEG COUNT
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO TSMS CARRIER OVFL PC
Feature no	F1735

FEATURE SYNOPSIS

This feature provides overflow peg count of the following types of calls:

IntraLATA - Intrastate (LDSRA)
IntraLATA - Interstate (LDIRA)
InterLATA - Intrastate (LDSER)
InterLATA - Interstate (LDIER)

separated by carrier and destination numbers.

FEATURE DESCRIPTION

Regular TSMS provides peg count, set up and connection usage of the following types of calls:

direct dialled (DD)
operator assisted (OA)
no prefix dialled (NP)

separated by source and destination numbers.

This feature increases (optionally) the number of ways that traffic can be separated. In addition to DD, OA, or NP for regular traffic it is necessary to separate equal access traffic in accordance with LATA/state attributes as specified under Feature Synopsis above.

This feature also eliminates source separation numbers for equal access calls and substitutes instead carrier separation numbers. This leaves the separation number for the carrier and the separation number for the outgoing trunk (direct or tandem) to separate equal access traffic into the four LATA/state categories mentioned above.

Thus, when the equal access TSMS package is needed, there is a new table similar to TFANINT called OCCTSINT. This new table has as its key a carrier separation number and a destination number, and instead of separating calls by type (DD, OA, NP), calls are separated into the four LATA/state categories. Each field contains an OM register number, but this number is an index into a new OM group called EATSMS.

Thus, regular traffic will still be separated by source and destination number based on the type of each call, and equal access traffic will be separated by carrier and destination number based on LATA/state categories.

This feature adds:

new commands to handle OM data for EA TSMS

new tables (OCCTSINT, OCCINFO)

new PARM's

new log reports (F1735 only)

new OM group - EATSMS

REFERENCES

FDOC BC1132, BC1127

FSD 20-24-0000

Package	NTX085AA05 TRAFFIC SEPARATION PEG COUNT
Feature set	ADMINISTRATION
Feature	TSMS PEG COUNT ON IBN
Feature no	F2464

FEATURE SYNOPSIS

This feature extends the existing capabilities of the traffic separation measurement system TSMS to include IBN peg counts. It will allow traffic separation measurements (TSM) to be made on calls originating from or terminating on a specific network class of service (NCOS) within a specific customer group. Measurements regarding IBN trunks are available.

FEATURE DESCRIPTION

This feature incorporates TSM attempt pegs. Attempt pegs are a count of connections made through the switch. To identify the various lines to be included in the traffic separation measurement, a traffic separation number, TRAFSNO, is entered into the table NCOS. IBN trunks have TRAFSNOS assigned in the table TRKGRP. The TRAFSNOS serve as a source traffic separation number when the call originates and/or a destination traffic separation number when the call terminates.

Attendant console extended calls are also pegged. For these calls a peg is generated from the originator to the console, and when extended a peg is generated from the console to the terminator.

Package	NTX085AA05 TRAFFIC SEPARATION PEG COUNT
Feature set	ADMINISTRATION
Feature	TSMS PDAB/PDTP PEG COUNT
Feature no	F2484

FEATURE DESCRIPTION

The Traffic Separation Measurement System (TSMS) feature provides a means by which switched traffic may be separated on a point-to-point basis. The components of a call which are measured and separated are the setup time, attempt peg count and the connect time. They are collected at source_traffic_separation cross destination_traffic_separation (STS X DTS) intersection. These data can be used in traffic separation analysis.

For type 3 traffic (partial dial abandon (PDAB) and partial dial timeout (PDTP)), which is defined in Essential Traffic Separation Data Digital Switching Systems, the following categories are identified :

(a) False Start :

False start is the case when a line is offhook and is then onhook/flash without dialing any digits before dialtone timeout.

(b) Partial Dial Abandon :

Partial dial abandon is the case when a line is offhook and is then onhook after dialing at least one digit. This has to happen before all digits are dialed and before interdigit timeout.

(c) Dialtone Timeout :

Dialtone timeout is the case when a line is offhook till dialtone timeout without dialing any digits. The call is then routed to a treatment.

(d) Interdigit Timeout :

Interdigit timeout is the case when a line is offhook and before a complete set of digits are dialed but timeout between dialing digits. The call is then routed to a tone/announcement treatment.

At present, calls which fail called number integrity (e.g. partial dial timeout (PDTP)) are routed via the treatment table, and these call attempts are pegged at STS X TONE/ANNOUNCEMENT intersection. Calls which are abandoned prior to called number routing analysis (e.g. partial dial abandon , false start) do not contribute attempt pegs. In practice, these abandoned calls use up hardware and software resources as routed calls do. As far as TSMS system is concerned, all the calls should be taken into consideration. This feature will enable type 3 traffic (ie. (a) & (b) cases) pegs to be included in the separation data.

FEATURE DESCRIPTION

This feature is used to extend the existing TSMS capability of attempt pegs to type 3 traffic (PDAB/False-Start) calls of DMS100 and RLM lines (including PBX lines). Only the locally originated partial dial traffic will be pegged. These measurements are not applicable to incoming traffic or trunks except PBX trunks.

The basic requirements for the PDAB/PDPTO traffic separation measurements are to measure and distinguish the above categories. At present categories C and D are pegged at STS X Tone/Announcement intersection as one category (PDPTO), however they can be distinguished by assigning different DTSNs to the treatments if required.

The major contribution of this feature is to measure and to distinguish categories A and B traffics (PDAB). Two new generic DTS numbers :

```
False_start      ( FSDTS ) = 7 ,  
Partial_Dial_Abandon ( PDADTS ) = 8
```

will be added to the existing generic destination group to distinguish the two types of partial dial abandon calls. A False Start abandon call will be pegged at STS X FSDTS 7 intersection, and a Partial dial abandon call will be pegged at STS X PDADTS 8 intersection. Fig. 1 shows the flow diagram for PDAB/PDPTO.

An assignment of FSDTS/PDADTS to the intersection STS X FSDTS/PDADTS must be done via table TFANINT (refer to TSMS Reference and Users Guide for detail on TFANINT). An attempt peg will be made at STS X FSDTS/PDADTS intersection after table TFANINT is properly filled.

Package	NTX085AA05 TRAFFIC SEPARATION PEG COUNT
Feature set	ADMINISTRATION
Feature	EAE0 - PEG COUNT
Feature no	F3737

FEATURE SYNOPSIS

This feature provides peg count of the following types of calls:

IntraLATA - Intrastate (LDSRA)
IntraLATA - Interstate (LDIRA)
InterLATA - Intrastate (LDSER)
InterLATA - Interstate (LDIER)

separated by carrier and destination numbers.

FEATURE DESCRIPTION

Regular TSMS provides peg count, set up and connection usage of the following types of calls:

direct dialled (DD)
operator assisted (OA)
no prefix dialled (NP)

separated by source and destination numbers.

This feature increases (optionally) the number of ways that traffic can be separated. In addition to DD, OA, NP for regular traffic it is necessary to separate equal access traffic in accordance with LATA/state attributes as specified under Feature Synopsis above.

This feature also eliminates source separation numbers for equal access calls and substitutes instead carrier separation numbers. This leaves the separation number for the carrier and the separation number for the outgoing trunk (direct or tandem) to separate equal access traffic into the four LATA/state categories mentioned above.

Thus, when the equal access TSMS package is needed, there is a new table similar to TFANINT called OCCTSINT. This new table has as its key a carrier separation no. and a destination number, and instead of separating calls by type (DD, OA, NP), calls are separated into the four LATA/state categories. Each field contains an OM register number, but this number is an index into a new OM group called EATSMS.

Thus, regular traffic will still be separated by source and destination number based on the type of each call, and equal access traffic will be separated by carrier and destination number based on LATA/state categories.

This features adds:

new commands to handle OM data for EA TSMS

new tables (OCCTSINT, OCCINFO)

new PARM's

new LOG reports (F1735 only)

new OM group - EATSMS

REFERENCES

FDOC BC1132 EAE0 - Peg Count
FSD 20-24-0000

NTX087AA04 Status: RTM TRAFFIC SEPARATION USAGE

ADMINISTRATION	:	
TSMS USAGE SOURCE AND DISPOSITION UP TO 128		F1220
TSMS USAGE ON IBN		F2465
TSMS PDAB/PDTO USAGE		F2485
EAEO - USAGE		F3738

Package	NTX087AA04 TRAFFIC SEPARATION USAGE
Feature set	ADMINISTRATION
Feature	TSMS USAGE SOURCE AND DISPOSITION UP TO 128
Feature no	F1220

FEATURE SYNOPSIS

This is an optional Software Feature to either the basic traffic analysis peg count (F1218) or the traffic separation peg count (NTX085AA F1219) and provides setup and connect time usage.

The setup usage is measured in call seconds (CS) and connect time usage in centi call seconds (CCS).

The output of the OM group TFCANA can be accessed by the normal OM OMSHOW and OMPRT commands. An optional summary report is available with NTX088A.

FEATURE DESCRIPTION

Package	NTX087AA04 TRAFFIC SEPARATION USAGE
Feature set	ADMINISTRATION
Feature	TSMS USAGE ON IBN
Feature no	F2465

FEATURE SYNOPSIS

This feature extends the existing traffic separation measurement system TSMS to include IBN usage measurement. TSMS measurements will be made on calls originating from or terminating on a specific network class of service (NCOS) within a specific customer group. Measurements regarding usage on IBN trunks are available.

FEATURE DESCRIPTION

This feature incorporates TSM usage on IBN. Set up and connect usage times indicate how long it took to set up a call and how long the connection was held.

To identify the various lines to be included in the traffic separation number, TRAFSNO, is entered into the table NCOS. IBN trunks have TRAFSNO's assigned in the table TRKGRP.

For console applications set up usage and connect usage are collected from the originator to the console. When the attendant extends the call, set up usage is collected from the console to the terminator starting at the time that the console operator hits the exclude source key. Connect usage is collected at the intersection of the console and the terminator once the call has begun its extension, and continues to be collected at that intersection even after the console drops out.

Package	NTX087AA04 TRAFFIC SEPARATION USAGE
Feature set	ADMINISTRATION
Feature	TSMS PDAB/PDTP USAGE
Feature no	F2485

FEATURE SYNOPSIS

The Traffic Separation Measurement System (TSMS) feature provides a means by which switched traffic may be separated on a point-to-point basis. The components of a call which are measured and separated are the setup time, attempt peg count and the connect time. They are collected at source_traffic_separation cross destination_traffic_separation (STS X DTS) intersection. These data can be used in traffic separation analysis.

For type 3 traffic (partial dial abandon (PDAB) and partial dial timeout (PDTP)), which is defined in Essential Traffic Separation Data Digital Switching Systems, the following categories are identified :

(a) False Start :

False start is the case when a line is offhook and is then onhook/flash without dialing any digits before dialtone timeout.

(b) Partial Dial Abandon :

Partial dial abandon is the case when a line is offhook and is then onhook after dialing at least one digit. This has to happen before all digits are dialed and before interdigit timeout.

(c) Dialtone Timeout :

Dialtone timeout is the case when a line is offhook till dialtone timeout without dialing any digits. The call is then routed to a treatment.

(d) Interdigit Timeout :

Interdigit timeout is the case when a line is offhook and before a complete set of digits are dialed but timeout between dialing digits. The call is then routed to a tone/announcement treatment.

At present, calls which fail called number integrity (e.g. partial dial timeout (PDTP)) are routed via the treatment table, and the usages of these calls are collected at STS X TONE/ ANNOUNCEMENT intersection. Calls which are abandoned prior to called routing analysis (e.g. partial dial abandon , false start) do not contribute setup/connect usages. In practice, these abandoned calls use up hardware and software resources as routed calls do. As far as TSMS system is concerned, all the calls should be taken into consideration. This feature will enable type 3 traffic (ie. (a) & (b) cases) usages to be included in the separation data.

FEATURE DESCRIPTION

This feature is used to extend the existing TSMS capability of usage measurement to type 3 traffic (PDAB/False-Start) calls of DMS100 and RLM lines (including PBX lines). Only the locally originated partial dial traffic will be collected. These measurements are not applicable to incoming traffic or trunks except PBX trunks.

The basic requirements for the PDAB/PDTO traffic separation measurements are to measure and distinguish the above categories. At present categories C and D are collected at STS X Tone/Announcement intersection as one category (PDTO), however they can be separated by assigning different DTSNs to the treatments if required (see examples in DID R0484fn).

The major contribution of this feature is to measure and to distinguish categories A and B traffics (PDAB). In order to collect the PDAB setup usage, it is required to calculate the time difference at STS X FSDTS/PDADTS intersection. This will be done only once. There is no connect usage collection for PDAB calls. Assignments of FSDTS and PDADTS to the intersections STS X FSDTS and STS X PDADTS must be done via table TFANINT (see examples in DID R0484fn). Fig. 1 shows the flow diagram for PDAB/PDTO.

In the case of 3-way calling, False Start and Partial Dial Abandon calls will cause setup usage at STS X PDADTS. This feature will treat these two types of abandon calls as one type.

For overlapped outpulsing traffic, the setup usage will be collected at STS X DTS intersection as soon as enough digits are available to route the call. Since this occurs before all digits are collected, no setup usage will be collected at STS X PDADTS (PDAB case) or STS X treatment (PDTO case) intersection even if the call is subsequently abandoned.

Package	NTX087AA04 TRAFFIC SEPARATION USAGE
Feature set	ADMINISTRATION
Feature	EAE0 - USAGE
Feature no	F3738

FEATURE SYNOPSIS

This feature provides set up and connect usage of the following types of calls:

IntraLATA - Intrastate (LDSRA)
IntraLATA - Interstate (LDIRA)
InterLATA - Intrastate (LDSER)
InterLATA - Interstate (LDIER)

separated by carrier and destination numbers.

FEATURE DESCRIPTION

Regular TSMS provides peg count, set up and connection usage of the following types of calls:

direct dialled (DD)
operator assisted (OA)
no prefix dialled (NP)

separated by source and destination numbers.

This feature increases (optionally) the number of ways that traffic can be separated. In addition to DD, OA, or NP for regular traffic, it is necessary to separate equal access traffic in accordance with LATA/state attributes as specified under Feature Synopsis above.

This feature also eliminates source separation numbers for equal access calls and substitutes instead carrier separation numbers. This leaves the separation number for the carrier and the separation number for the outgoing trunk (direct or tandem) to separate equal access traffic into the four LATA/state categories mentioned above.

Thus, when the equal access TSMS package is needed, there is a new table similar to TFANINT called OCCTSINT. This new table has as its key a carrier separation number and a destination number, and instead of separating calls by type (DD, OA, NP), calls are separated into the four LATA/state categories. Each field contains an OM register number, but this number is an index into a new OM group called EATSMS.

Thus, regular traffic will still be separated by source and destination number based on the type of each call, and equal access traffic will be separated by carrier and destination number based on LATA/state categories.

This feature adds:

new commands to handle OM data for EA TSMS

new tables (OCCTSINT, OCCINFO)

new PARM's

new LOG reports (F1735 only)

new OM group - EATSMS

REFERENCES

FDOC BC1132 EAO Peg Count
FSD 20-24-0000

NTX088AA04 Status: RTM TRAFFIC SEPARATION REPORT

ADMINISTRATION	:	
TSMS REPORT SUMMARIZED		F1221
TSMS REPORT SUMMARIZED ON IBN		F2466
TSMS REPORT SUMMARIZED FOR PDAB/PDIO		F2486
EAEO - REPORT		F3739

Package	NTX088AA04 TRAFFIC SEPARATION REPORT
Feature set	ADMINISTRATION
Feature	TSMS REPORT SUMMARIZED
Feature no	F1221

FEATURE SYNOPSIS

This is an optional Software Feature which provides an output report of the TFCANA OM group with a summation of register data and multiple column output. This report is scheduled Via the OMREPORT scheduling data table.

The pegs/usages and their associated overflows are summed for a single TFCANA number output. The setup usage is converted to CCS and added to the connect usage to give a usage subtotal for each TFCANA number.

FEATURE DESCRIPTION

Package	NTX088AA04 TRAFFIC SEPARATION REPORT
Feature set	ADMINISTRATION
Feature	TSMS REPORT SUMMARIZED ON IBN
Feature no	F2466

FEATURE SYNOPSIS

This feature extends the existing traffic separation measurement system TSMS to include summary reports for IBN and IBN custom calling features.

FEATURE DESCRIPTION

This feature incorporates traffic separation measurements (TSM) report facilities with IBN. TSM are made on calls originating from or terminating on a specific NCOS (network class of service) within a specific customer group. Measurement regarding IBN trunks are available. Summary reports are included for IBN custom calling features.

Package NTX088AA04 TRAFFIC SEPARATION REPORT
 Feature set ADMINISTRATION
 Feature TSMS REPORT SUMMARIZED FOR PDAB/PDPTO
 Feature no F2486

FEATURE DESCRIPTION

The reporting capability of the Traffic Separation Measurement System will be enhanced. The proposed enhancements are general in nature and are not particular to PDAB/false starts. The proposed enhancements are as follows.

1) The OM report for TFCANA is currently of the following form:

```

DATA    L_LEN   = L    44  Wide enough paper has been provided to
                      44  enable "double speading" of the report across
                      44  a page - ( s indicates no)
          SET_U   = Y    44
          CON_U   = Y    44  Setup, Connect and Usage Total will be provided
          SUM_U   = Y    44
    
```

REGNO	PEGS	SET_U	CON_U	SUM_U	REGNO	PEGS	SET_U	CON_U	SUM_U
0	14	1	1	2	1	0	0	0	0
2	0	0	0	0	3	0	0	0	0
4	0	0	0	0	5	0	0	0	0
6	0	0	0	0	7	0	0	0	0
8	0	0	0	0	9	0	0	0	0
10	0	0	0	0	11	0	0	0	0
12	0	0	0	0	13	0	0	0	0
.
.
.

E N D O F R E P O R T

The proposed enhancement is the provision of a 'totals line' which will sum the columns of the existing report. The revised report will appear as follows:

REGNO	PEGS	SET_U	CON_U	SUM_U	REGNO	PEGS	SET_U	CON_U	SUM_U
0	14	1	1	2	1	0	0	0	0
2	0	0	0	0	3	0	0	0	0
4	0	0	0	0	5	0	0	0	0

6	0	0	0	0	7	0	0	0	0
8	0	0	0	0	9	0	0	0	0
10	0	0	0	0	11	0	0	0	0
12	0	0	0	0	13	0	0	0	0
.
.
.

Totals: 14 1 1 2

E N D O F R E P O R T

(2) Currently there exists a TSMS CI increment called 'TFAN'. In this mode the following commands are defined:

QUERYTS - List Tone, Anns, Trk Clli & Linattr for a Trafsno(s)

QUERYCLLI - List TRAFSNO for a trk-clli (all for all trks)

QUERYREG - Display TS Reg(s) & their Intersection Point(s)

QUERYINT - Display all Terminals for an Intersection(s)

To this list will be added the commands:

(a) TSREPTSNO - Display OM register data from STSN(s) to DTSN(s)

(b) TSREPREG - Display OM data from register to register

(2a) This new command will summarize the information from a source(s) to a destination(s) . Upon request details will also be provided. The command will have the following format:

TSREPTSNO <class> <frstsn> <tostsn> <frdtsn> <todtsn> [<details>]

where: CLASS is the om register class

FRSTSN is the start Source Traffic Separation Number

TOSTSN is the end Source Traffic Separation Number

FRDTSN is the start Destination Traffic Separation Number

TODTSN is the end Destination Traffic Separation Number

DETAILS is optional and when input causes all the details
----- to be output

Sample inputs and outputs from this command are as follows:

example 1:

CI: >tfan TFAN: >tsreptsno active 15 15 0 127

SOURCE TRAFSNOs = 15 15 DESTINATION TRAFSNOs = 0 127

	PEGS	SET_U (CCS)	CON_U (CCS)	SUM_U (CCS)

TOTALS:	28	7	6	13

example 2:

CI: >tfan TFAN: >tsreptsno active 15 15 0 127 details

SOURCE TRAFSNOs = 15 15 DESTINATION TRAFSNOs = 0 127

REGNO	PEGS	SET_U (CCS)	CON_U (CCS)	SUM_U (CCS)

2	6	1	1	2
7	3	1	1	2
23	15	3	2	5
10	4	2	2	4
TOTALS:	28	7	6	13

Note that the command QUERYINT can be used in conjunction with this command to find out sources and intersections.

The register numbers do not appear in sequential order. As many reports as required can be produced by repeating the command. (2b) This new command will summarize the information between the two given registers. The command will have the following format:

TSREPREG <class> <fromreg> <toreg> [<details>]

where: CLASS is the om register class

FROMREG is the register number at which to start report

TOREG is the register number at which to end report

DETAILS is optional and when input causes all the
----- details to be output

Fromreg and Toreg are sequential but the display is random.

Sample inputs and outputs from this command are as follows:

example 1:

CI: >tfan TFAN: >tsrepregholding 1 10

REGISTER = 1 TO REGISTER = 10

	PEGS	SET_U (CCS)	CON_U (CCS)	SUM_U (CCS)
TOTALS:	7	3	3	6

example 2:

CI: >tfan TFAN: >tsrepregholding 1 10 details

REGISTER = 1 TO REGISTER = 10

REGNO	PEGS	SET_U (CCS)	CON_U (CCS)	SUM_U (CCS)
1	2	1	1	2
9	2	1	1	2
6	3	1	1	2
TOTALS:	7	3	3	6

(3) A further enhancement needed is to provide the ability to recognize special tones as a valid destination. Currently only TONES, ANNS, TRK CLLIs, and LNATTRs are recognized as valid sources and/or destinations.

The two commands of interest are QUERYTS and QUERYINT. These two commands reference TONES, ANNS, TRK CLLIs and LNATTRs, to these would be added special tones(STN). Typical output from QUERYTS would become:

TSno	Trml	Name/Loc	Info	-----	20
TONE	³ FRA0	20	TONE	SILNT	21
TONE	³ BUSY	25	ANNS	VCA	26
PSPD	31	CLLI	TOPOGBC	OG	42
			STN	ROH	
					0
<----- new					
.
.

Typical output from QUERYINT would become:

Indx (IN-OUT)	INCOMING	OUTGOING

31	32	DD-REGNO= 100	OA-REGNO= 101	NP-REGNO= 102		
	CLLI	TOPCNBMF1	2W	CLLI	TOPOBGC	OG
	CLLI	TOPCOMADP	IC	CLLI	TOPOGNY	OG
	:	:	:	:	:	:

41	20	DD-REGNO= 111	OA-REGNO= 111	NP-REGNO= 111		
	CLLI	HULLPQ1077X1	IC	STN	ROH	0
				TONE	120TO	
				TONE	TSTONE	
				:	:	
				.	.	

OPTIONALITY

(1)&(2) These abilities will be included with the enhanced traffic separation feature.

(3) This ability will be included with the basic traffic separation feature.

Package	NTX088AA04 TRAFFIC SEPARATION REPORT
Feature set	ADMINISTRATION
Feature	EAE0 - REPORT
Feature no	F3739

FEATURE SYNOPSIS

This feature provides a periodic summary report of all peg and usage counts set up in equal access TSMS feature of the following types of calls:

IntraLATA - Intrastate (LDSRA)
IntraLATA - Interstate (LDIRA)
InterLATA - Intrastate (LDSER)
InterLATA - Interstate (LDIER)

separated by carrier and destination numbers.

FEATURE DESCRIPTION

Regular TSMS provides peg count, set up and connection usage of the following types of calls:

direct dialled (DD)
operator assisted (OA)
no prefix dialled (NP)

separated by source and destination numbers.

This feature increases (optionally) the number of ways that traffic can be separated. In addition to DD, OA, or NP for regular traffic it is necessary to separate equal access traffic in accordance with LATA/state attributes as specified under feature synopsis above.

This feature also eliminates source separation numbers for equal access calls and substitutes instead carrier separation numbers. This leaves the separation number for the carrier and the separation number for the outgoing trunk (direct or tandem) to separate equal access traffic into the four LATA/state categories mentioned above.

Thus, when the equal access TSMS package is needed, there is a new table similar to TFANINT called OCCTSINT. This new table has as its key a carrier separation number and a destination number, and instead of separating calls by type (DD, OA, NP), calls are separated into the four LATA/state categories. Each field contains an OM register number, but this number is an index into a new OM group called EATSMS.

Thus, regular traffic will still be separated by source and destination number based on the type of each call, and equal access traffic will be

separated by carrier and destination number based on LATA/state categories.

This feature adds:

new commands to handle OM data for EA TSMS

new tables (OCCTSINT, OCCINFO)

new PARM's

new LOG reports (F1735 only)

new OM group - EATSMS

REFERENCES

FDOC BC1132 EAEO - Report
FSD 20-24-0000

Package	NTX090AA01 COIN SERVICES
Feature set	COIN SERVICES
Feature	LOCAL COIN OVERTIME CHARGING
Feature no	F1228

DESCRIPTION

0.0 Abbreviations

CCF - Coin First Pay Station
CDF - Dail Tone First Pay Station
CSP - Semi-Post Pay Coin station
LSSGR - Local Switching System General Requirements
FSD - Feature Specification Document
LCO - Local Coin Overtime
IBN - Integrated Business Network (or SL100)

1.0 Functional Description

1.1 Introduction

The Local Coin Overtime (LCO) Feature provides an overtime charge on local calls made from CDF and CCF coin stations. For this purpose, the local call is divided into two distinct periods: initial and overtime. These periods are customer definable and may take from any value from 60 to 3600 seconds in 1 second increments.

In the current DMS-100 system, local calls made from coin stations are treated as untimed, one charge calls (unless the called party happens to be a free number); i.e. the deposit made prior to dail tone in the case of CCF station and the one made before dailing has been completed in the CDF station will satisfy the charge required for the full duration of the call.

Now with the incorporation of this feature (LCO), the optionality to provide either untimed or timed local coin calls will be possible. The timed local call will be referred to as Local Coin Overtime Call and takes its name from the that fact the call will be split in charging periods based on an initial time period followed by subsequent overtime periods.

1.2 Feature Operation

The initial period begins after the called party answers. The initial deposit will be collected 30 seconds prior to the expiration of the initial period. The sound of the coin being

collected will be an indication to the calling party that the initial period is near completion and that the calling party must either hang up or make an overtime deposit to continue uninterrupted.

At the end of the initial period, if no disconnect has been detected, an overtime coin present test (refer section 1.3) will be made for overtime coin deposit. The presence of a coin will result in start of an overtime period. If a coin is not present both the calling and the called party will be given a coin overtime treatment specified by the customer. See section 1.4 for details. This treatment will prompt the calling coin party for the overtime deposit. Thirty seconds after the treatment is applied another overtime coin present test will be made. If this test detects a deposit the call will be allowed to continue in overtime. If no deposit is detected the call will be disconnected. Timing for the overtime period starts at the end of the treatment.

A local call may continue through unlimited numbers of overtime periods and the above described process will be repeated for each overtime period. Refer Figure to 1 for details.

1.3 Coin Functions

Coin collect function will be performed 30 seconds prior to expiration of initial and each overtime period. Nevertheless the stuck coin test will only be done at the disconnect time, since it is required that the coin collection should be carried out without the stuck coin test during the course of a call (refer FSD 10-01-0000 of LSSGR for details).

Initial coin present test is done by applying -48 Volts to tip. However, overtime coin present test can either be done by applying +48 Volts or -48 Volts to tip. Customer will be able to specify appropriate voltage for coin overtime present test via office engineering (OFCENG) table.

NOTE: LM/RLM firmware development is required to support +48 Volts coin present test. This is covered by a firmware feature F0188.

1.4 Coin Overtime Treatment

The Coin Overtime Treatment can either be an announcement or a tone. Customer will be able to specify the treatment using existing methods provided in DMS-100. Both the calling and the called party will be connected via a 3-way conference bridge to the treatment. The announcement will be connected for one cycle without audible ringing, whereas the tone will be connected for a period of time specified by the customer.

NOTE: If tone is specified for coin overtime treatment the customer will be able to data fill a time period 1 to 255 seconds in table TONES. But application of tone over 15 seconds is high for coin overtime treatment. Hence tone will only be applied for 15 seconds even if the customer data fills more than 15 seconds.

1.5 Resource Requirements:

Following resources are required to accomplish the functions associated with this feature:

- (i) Call processing extension block,
- (ii) 3-way conference bridge,
- (iii) Announcement/Tone,
- (iv) Network Connections.

If any one of the above mentioned resources is unavailable, then the call will be permitted to continue with repeated attempts to seize the resource at 30-second intervals.

1.6. Limitations

Due to the hardware limitation associated with semi-post pay coin stations (CSP), this feature only applies to:

- (i) Coin First Pay stations (CCF),
- (ii) Dial Tone First Pay stations (CDF).

1.7 Feature Interactions

Local coin call with overtime charging will only be subjected to following restrictions provided the local call terminates within the same switch.

While the local coin call is connected to coin overtime treatment via a 3-port conference bridge any feature activation like threeway calling, malicious call tracing etc. will be ignored. However, feature activation outside local coin overtime treatment period is allowed. Following sections gives feature operations and restrictions of affected features.

1.7.1 Malicious Call Tracing

If called line activates malicious call tracing, then the local coin call will not be subjected to overtime charging. This is due to the fact that the speech path may be held by the called line. Hence the coin line is no longer responsible for making overtime coin deposits.

1.7.2 Threeway Calling

If the called line activates a threeway call, the call will progress in normal manner. But, a 5-second warning tone followed by a

30-seconds time period will be given to the coin line when it runs out of money, as a reminder to make overtime coin deposit. At the end of 30-seconds timeout period an overtime coin present test will be made. If no deposit is detected the coin caller will be disconnected. Otherwise coin call will be allowed to continue in overtime. All timing values will be same as given in Figure-1. Note in the case of threeway calling, any coins deposited will not be returned after the commencement of warning tone even if the coin line hangs up during the application of the warning tone.

1.7.3 Call Waiting

Call waiting feature of a called line will be disabled when the local coin call is subjected to overtime charging. Furthermore, a coin line making a local coin overtime chargeable call to a busy line with call waiting feature will receive a busy treatment.

1.7.4 IBN features

This feature is currently applicable in local or local/toll environment and needs some more development effort before it can be adapted in IBN environment.

1.7.5 Multi-Unit Message Rate

If the Time Dependency Control (TDC) portion of the Multi-Unit Message Rate service is loaded on the switch the office parameters LOCAL_COIN_INIT_TIME and LOCAL_COIN_OVER_TIME will not be used to specify the initial or overtime periods for this feature. Instead the periods will be taken from the table CHARGTAB which was created for feature R0440. (REF to R0440 documentation for use with MUMR)

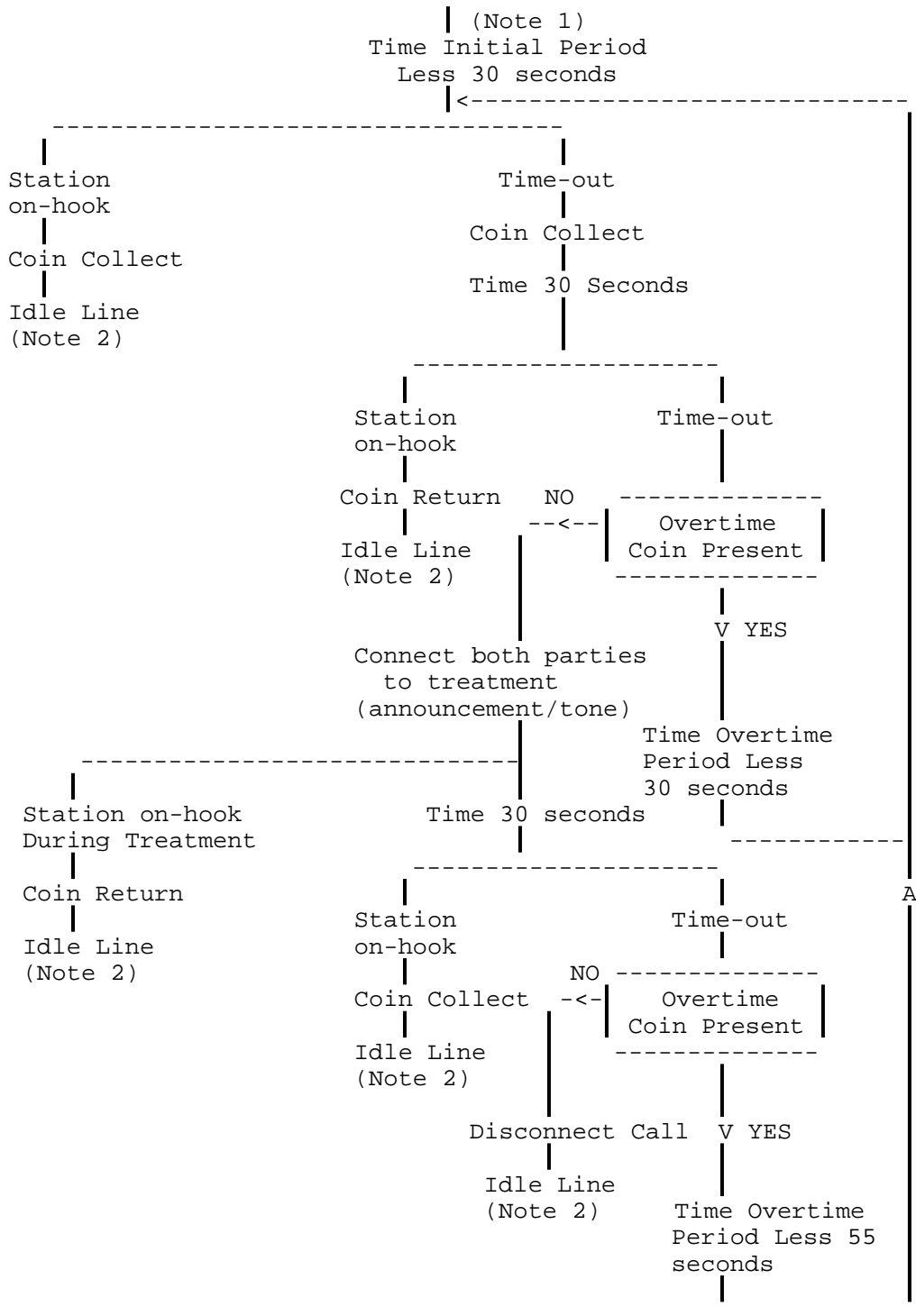


Figure 1: Flow Diagram for Local Coin Overtime

Note 1: Local coin call origination is not given
Note 2: Coin stuck test will be performed if
 necessary when idling a coin station.

Package	NTX093AA01 REMOTE/TOLL CALL FORWARDING-TOPS OFFICE
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	AMA RECORD ON REMOTE/TOLL CALL FORWARDING
Feature no	F1239

FEATURE SYNOPSIS

This feature is applicable for DMS 200 or DMS 100/200 offices equipped with CAMA or TOPS and serving one or more RCF base offices provided with RCF-CAMA Mode feature (F1238).

This feature covers the following functions:

1. Serving of a separate I/C RCF trunk group from each designated RCF base office in addition to the regular I/C CAMA trunk group from that office.
2. Provisioning of standard AMA recording on the I/C RCF trunk group.
3. Generation of ANI wink signal (nominal 140 msec) on I/C RCF trunk group.
4. Provisioning of transparency to answer supervision from the terminating end of the RCF call to pass it back to the originating RCF base office.
5. Routing of ANI failed or timed-out RCF calls to appropriate tone or announcement, as these calls must not be routed to CAMA operator.

FEATURE DESCRIPTION

NTX094AA01 Status: RTM DIGITAL SUBSCRIBER SERVICES

TYPES OF LINES	:	
FX LINE TERMINATION ON DCM		F2054
SERVICES	:	
ANSWER SUPERVISION TO PBXS FOR TOLL CALLS		F2430
1 OR 2 WAY DID/DOD VIA DCM		F2459
1 OR 2 WAY INWATS/OUTWATS VIA DCM		F2483
CALLED PARTY HOLD ON CALLS TO PBX		F2502

Package	NTX094AA01 DIGITAL SUBSCRIBER SERVICES
Feature set	TYPES OF LINES
Feature	FX LINE TERMINATION ON DCM
Feature no	F2054

DEVELOPMENT

BNR software is required.

FEATURE DESCRIPTION

Foreign Exchange (FX) feature permits a central office to provide a subscriber in a foreign area (located outside the normal serving area) with services available to local subscribers. In other words, no distinction is made between FX and local subscriber lines.

An FX service has two ends: the Central office end and the station end. Traditionally the FX service is provided in an analogue fashion by using FXO or SAO channel units at the office end and FXS or SAS channel units at the station end.

When DMS is used as FX Central office end, a DCM interface can be used to provide the FX service. Basically, the DMS will emulate the signalling protocols of FXO or SAO. The following features are supported:

a) Calls originated by FX subscribers

i) Idle Conditions:

- DCM receivers on-hook from FX station (Ring open, loop open)
- DCM signals idle to FX station (Tip ground, No ringing)

ii) FX Subscriber requests service.

- DCM receives off-hook from FX station
(Ring open, loop closed)
- DMS-100 responds by making the DCM channel busy for all other calls, prepares to receive customer dialling (e.g. attaching a digitone receiver) and returns dial tone to the FX subscriber.

iii) FX Subscriber Dials

- Customer forwards digits to DCM using DP or DTMF. In the case of DTMF, the digit information is transmitted in the form of MF tones in the voice band and are interpreted by the DTMF receivers. In the case of DP, the pulses are converted by SAS/FXS into appropriate A/B codes and forwarded over the DCM channel. The incoming A/B code is interpreted by the DMS software.

iv) Call processing and routing

DMS-100 routes the call as appropriate and return call progress tone to the FX subscriber.

- V) DMS completes the connection and monitors the switchhook status of the FX subscriber and called party until disconnect. The switchhook status of the FX subscriber is interpreted through A/B bit signalling over DCM.

VI) Disconnect

As soon as one of the parties involved in the connection goes on hook the network connections are released. FX subscriber must send on-hook via SAS/FXS (ring open, loop open) and reverts to idle conditions as in (i).

Note that it is now possible for the DMS to send answer supervision to the FX line.

b) Call Terminating to FX Subscriber
-----i) Idle Conditions

Same as a) (i).

ii) Terminating call for FX Subscriber

A call terminating to FX subscribers directory number is routed to the preassigned DCM channel. The switchhook status of the FX subscriber is determined.

-If the FX subscriber is busy, i.e. SAS/FXS is signalling "Ring Open, loop closed" towards DCM, busy signal is assigned to the calling party.

-If the FX subscriber is on hook, i.e. SAS/FXS is signalling "Ring open, loop open" DMS-100 assigns ring back to the calling party and ringing over the preassigned DCM channel using A/B codes towards SAS/FXS, i.e. "Tip Ground Ringing" for 2 seconds and "Tip Ground, no ringing" for 4 seconds, respectively. DMS maintaining ringing and ring back signals unless calling party abandons or FX subscriber answers.

iii) FX Subscriber Answers

When the FX subscriber goes off hook, DCM receives "Ring Open, Loop Closed." In response to this, DMS removes ringing and ring back and completes the connections. The switchhook status of the 2 parties involved in the conversation is monitored until disconnect.

iv) Disconnect

Same as a) (vi).

Package	NTX094AA01 DIGITAL SUBSCRIBER SERVICES
Feature set	SERVICES
Feature	ANSWER SUPERVISION TO PBXS FOR TOLL CALLS
Feature no	F2430

FEATURE SYNOPSIS

This feature provides answer supervision back to a PBX when the PBX is set up for call detail recording.

FEATURE DESCRIPTION

A typical network configuration has a PBX homing on a class 5 end office which in turn homes on a class 4 CAMA center. Both the PBX and the class 4 CAMA provide call detail records of toll calls, hence both require answer supervision.

At present the class 4 CAMA center sends a steady off hook signal back to the DMS-100 class 5 end office as an ANI-request (for ANI spill). Answer supervision is not provided back on an incoming CAMA connection.

This feature allows the class 4 CAMA and the class 5 end office to re-transmit answer supervision back to the PBX.

In the case where the class 5 end office has LAMA then the DMS-100 also has the ability to provide answer supervision back to the PBX.

The PBX-CO interface can be either:-

- a) Line card
- b) Two way DID/DOD analog trunk
- c) Two way DID/DOD digital trunk
- d) Two way INWATS/OUTWATS digital trunk

When this feature is provided, toll diversion and message registration will not be supported. With this feature, the ANI-Request from the class 5 office can still be either wink or steady off hook (Telco specifiable).

Package	NTX094AA01 DIGITAL SUBSCRIBER SERVICES
Feature set	SERVICES
Feature	1 OR 2 WAY DID/DOD VIA DCM
Feature no	F2459

FEATURE DESCRIPTION

To provide DID, DOD, DID/DOD 2 way digital service to a PABX a new trunk group will be provided : PX . This will have the characteristic of a P2 type trunk with the following enhancements:

- i) certain options
- ii) answer supervision
- iii) WATS service
- iv) called party hold

Items ii) and iv) will also be applied to the P2 type trunks and PBX lines.

1. Digital Line Interconnection

A Digital line into a DCM is defined as a ringable appearance to the DMS-100 C.O. of a circuit which supports certain line features. The following connections will be supported:

- i) digital line
- ii) digital PBX line

This is shown in figure 5.

2. Signaling

Both ground start or loop start lines can be accommodated. Ground start lines are traditionally used for PBX lines where a seize acknowledge signal is required (e.g. automatic dialers) and to provide a positive C.O. disconnect signal from the C.O. Loop start lines are used for standard subscriber sets.

The DCM attached to the DMS-100 C.O. emulates an FXO channel unit. This interfaces with a corresponding FXS channel unit via a T1 link at or near the subscribers premises. This is shown figure 5. In the case of a SL-100 PBX a direct connection of the T1 carrier facility can be made. See figure 6. This can be done because of the FX line capability on DCM referred to in reference 9.

a. Seize/Ring/No Outpulse Circuit

In terms of a PBX, a line supports a DOD function. Digits can be pulsed toward the C.O. Traditionally the DID function (digits outpulsed to the PBX) has not been supported. 3. Digital Trunk Interconnect

A digital trunk into a DCM is defined as a digital circuit appearance to a DMS-100 C.O. which supports DID, DOD or DID/DOD functions and is selected by the existing trunk selection (e.g.MIDL/LIDL) methods.

4. Signaling

There are two possible types of signaling for this application:

a. Trunk Signaling

Trunk signaling is defined as a protocol where only on hook or off hook states are allowed. No ringing state is used. In this situation if an analog interface is required at the customer premises DPO, DPT, 2w E&M and 4w E&M channel units will be supported. See figure 7. Where the PBX can emulate a channel unit supporting trunk type signaling no channel bank is required. This is shown in figure 8.

b. FXO Signaling

There is a possibility of interconnect using line signaling protocols. In this case a trunk appearance to the DMS-100 C.O. must support FXO type signaling. The limitations of this type of signaling means only a DOD function can be supported. The DID function is restricted to seizure only.

5. DOD Function

The DOD function allows the user in a PBX to place a call to a central office without requesting the assistance of an attendant. The DOD call is executed by dialing an access code (typically 9) waiting for second dial tone, followed by up to 16 digits (14 in MF, excluding KP & ST). The DMS central office must provide the following functions:

- i) Origination: Recognise an origination. Dial tone will then be returned on an optional basis.
- ii) Digit Reception: Receive upto 16 digits (14 in MF). The IPULSTYP will be set in TRKSGRP data. DTMF will imply DTMF and DP. DP and MF will imply only DP and MF respectively. Existing P2 analog PBX trunks allow either DP and DTMF regardless of IPULSTYP. The contents of P2 TRKSGRP data IPULSTYP will now be used.
- iii) Routing: Route the call in accordance with usual trunk appearance observing any options such as TDV and TDN.

iv) Answer: Provide answer supervision on local and toll calls (Toll call answer supervision F2430) on an optional basis. Perform LCDR if required.

v) Disconnect: Return called party status on disconnect with usual trunk timings.

vi) FXO signalling will be supported, either as Ground Start or Loop Start. No answer supervision can be performed off-network with this type of signalling. FXS signalling will not be supported. 6. DID Function

The DID function allows a customer to dial a number and terminate directly on a specific station. The DMS central office must perform the following functions:

i) Seizure: Seize a circuit in accordance with usual group circuit selection process. Perform any glare resolution necessary (2way operation). Receive start pulsing signal (WK, IM or DD) from the station and outpulse digits in DP, DTMF or MF formats depending the of the field OPULSTYP in TRKSGRP data. With MF or DTMF outpulsing, only wink (WK) or Delay Dial (DD) start signals will be allowed to avoid the use of tone detectors. No outpulsing is performed with the FXO circuits.

ii) Answer: Provide called party status to the calling party or incoming trunk.

iii) Disconnect: Provide calling party status and repeat it to the PBX.

iv) FXS signalling will not be supported because answer supervision is not passed back to through the network.

7. Glare Resolution for Two Way Operation

In the case of two way operation, a glare condition may occur when there are simultaneous seizure from both ends of the circuit.

Glare will be resolved according to the trunk subgroup parameter setting. If the DMS must yield, the incoming seizure will be processed and one more attempt to terminate to another circuit in the PX trunk group will be made before route advancing. 8. Options for PX trunks

With a view to enhancing PBX trunk software PX trunks will support the following options:

- i) ATC -- Automatic Time and Charge
- ii) CLI -- Calling Line Identification
- iii) FNT -- Free Number Terminating
- iv) HOT -- Hotel
- v) INW -- Inwats
- vi) LCDR -- Local Call Detail Recording

- vii) ONI -- Operator Number Identification
- viii) OWT -- Outwats
- ix) RMR -- Answer Supervision Local Calls (see sec 1.4)
- x) RMT -- Answer Supervision Toll Calls (see sec 1.4)
- xi) TDN -- Toll Denial
- xii) TDV -- Toll Diversion
- xiii) 2WW -- 2 way wats
- xi) SPB -- Special Billing

No other option will be allowed. All options will be assigned on a per group basis i.e. an option will apply to all the members of the group.

A set of these options can grouped in the PX Customer Group Table (CXGRP). Each tuple in the CXGRP table can handle any valid combination of these options. A maximum of 244 options sets can assigned in this table.

Each PX trunk group can point to a set of options by using a field in the trunk group data. One or more PX trunks can point to the same customer group options set (or index).

Within a specific customer group, options for both incoming and outgoing circuits may be specified. At call processing time, only the relevant options will be taken into considerations.

a. Optionality

Selection of the options will be obtained by the use of table TRKGRP and the customer group facility. Customer groups are accessed with an index and changed with standard table control procedures. The options assigned to a group are linked by this index to customer group data. It should be noted that SERVORD commands will not be supported with this optionality.

9. Billing and LCDR

Recording will be performed on a per trunk group basis both for AMA and LCDR. Both NT and AT&T recording formats will be supported. For INWATS calls, billing will be done to the special billing number. For all other cases, billing will be done to the special billing number (SPB option) if there is one, otherwise, the pilot number will be billed.

10. Service Analysis and Operational Measurements

Operational measurements will be provided on a per trunk group basis.

Service analysis treats existing P2 trunk types as lines. An origination is shown from the LNSMP (line network service maintenance plan)

level. For P2 trunks the LINESEL level is not supported. PX trunk types will be implemented in a similar way.

Traffic Separation data for all the call on the PX trunks will be available as per specified in the TSMS Reference and Users Guide.

1.2.11 ONI Calls

Calls from trunks with ONI option will be affected whether the office is a LAMA Office or not.

In case of a LAMA Office, the call will first appear on the Call-Position (Remote or Local). The operator will ask for the calling number from the subscriber on that circuit. Upon entering the calling number at the position, the NXX will be verified against the NXX of the pilot-dn or the NXX of the Special Billing (SPB) number (if that option is present).

For Non-LAMA Offices, the call should be routed to the toll-office on an OC, OP or A5 trunk groups. The ANI spill to the toll-office will indicate that the call is an ONI call.

12. Translation Verification (TRAVER)

The CI command Traver will be enhanced to include dialed digit verification on both the PX and P2 trunk types. Currently the P2 trunk was not supported by TRAVER.

Package	NTX094AA01 DIGITAL SUBSCRIBER SERVICES
Feature set	SERVICES
Feature	1 OR 2 WAY INWATS/OUTWATS VIA DCM
Feature no	F2483

FEATURE DESCRIPTION

1. Background

In the POTS environment, OUTWATS is a feature designed to meet the needs of users who make substantial volumes of long distance calls. This capability is provided by geographical regions called Service Areas or Zones, with the customer purchasing as many circuits per Zone as required. The arrangements of the Zones varies slightly between the U.S.A. and Canadian systems.

(a) Coverage is usually arranged by NPA, in concentric Zones about the HNPA with each Zone including all contained Zones of the same type.

(b) In Canada the Zones are numbered from 1 to 7 with Zone 1 being the HNPA, Zones 2 to 6 covering areas of increasing size, and Zone 7 covering the whole Country.

(c) In the U.S.A. the Zones are divided into two types: (i) intra-state Zones, Zones 8,9 & 0 are used for areas of increasing size within the host state.

(ii) inter-state Zones, Zones 1 to 6 cover the U.S.A. excluding the host state. Zones 1 to 5 cover increasingly large areas of the 48 state mainland plus Puerto Rico and the Amercian Virgin Islands. Zone 6 includes Zone 5 plus Hawaii and Alaska.

(d) International OUTWATS between the U.S.A. and Canada is not currently permitted.

INWATS, also called 800 service, is a service which allows customers to dial calls which otherwise would be placed through the Operator on a collect basis. Calls can be made at no charge to any INWATS circuit from telephones located within the Zones for which the INWATS subscriber has contracted. INWATS is a one way incoming service only and like OUTWATS can be purchased by Zones on a full time, measured time, or half measured time basis.

Two-Way WATS allows both INWATS and OUTWATS on the same circuit. This service is provided in the U.S.A., but only for intra-state use. It is not available in Canada.

2. Optionality

INWATS, OUTWATS or 2WWATS option will be applied in the customer group table as outlined in section 1.2.8.1 These options are mutually exclusive i.e. only one WATS service can be applied to each group. In addition certain options will be incompatible:

- i) INW -- None
- ii) OWT -- TDV,TDN
- iii) 2WW -- TDV,TDN.

An INWATS group will have a normal origination service. Denied origination can be achieved by assigning an outgoing direction to the group in table TRKGRP. Similarly an OWT option will imply a normal terminating service and a 2way WATS service will require a 2way trunk circuit. A compatibility chart is shown in Table 1.

3. Billing

INWATS billing (including INWATS service with 2WWATS) will be recorded using the existing office parameter INWATS_ON_AMA. Both NT and AT&T recording formats will be supported. Additionally the associated INWATS register will be provided on a group basis. These include calls_attempted, calls_completed and total_connect_time.

4. Service Analysis and Operational Measurements

Operational measurements will be implemented as section 1.2.10. Similarly, service analysis will be implemented as section 1.2.10. Additionally a WATS type call will be indicated where appropriate.

5. CI Commands

The REGISTER command will be modified to access the inwats registers associated with the PX trunk type INWATS service. The method of access will be by the associated trunk group DN only. Access by hardware location (e.g. LM bay drawer circuit) will not be allowed.

Package	NTX094AA01 DIGITAL SUBSCRIBER SERVICES
Feature set	SERVICES
Feature	CALLED PARTY HOLD ON CALLS TO PBX
Feature no	F2502

FEATURE DESCRIPTION

Called Party Hold (CPH) is a feature where a terminator having the option has control of disconnect over the call (e.g. the call will not be taken down unless the terminator goes on-hook).

This feature will be made available on a per trunk group basis for calls outgoing to a PBX over a P2 trunk and on a per customer group basis for PX trunk, providing the incoming leg is not an operator trunk.

1. Called party hold on a 2-way DID/DOD PBX trunk

This feature will be provided to two way DID/DOD PBX trunks as trunk group option.

2. Called party hold on a 1 way DID PBX trunk.

Currently, one way DID service is provided to a PBX using TO (EAS) trunks (outgoing local trunks). In this new implementation, this service will be provided using one way of the P2 trunks. The called party hold option can be specified in the same manner as for other P2 trunks (trunk group data).

3. Called party hold on digital PBX trunks

This feature will be provided to PX trunks as a customer group option.

4. Called party hold on a PBX line

Called party hold option (CPH) will be added to the list of allowable options for a PBX line.

NTX096AA01 Status: RTM TOPS NOTIS FORMAT

ADMINISTRATION :
NOTIS FORMAT FOR TROUBLE REPORT

F2374

Package	NTX096AA01 TOPS NOTIS FORMAT
Feature set	ADMINISTRATION
Feature	NOTIS FORMAT FOR TROUBLE REPORT
Feature no	F2374

FEATURE SYNOPSIS

SNAC outputs are translated to AT&T NOTIS format per AT&T operator services Operating Practice, Division C, Section 24, dated October 1979.

FEATURE DESCRIPTION

NTX098AA03 Status: RTM BELLCORE CAMA FORMAT

NUMBER IDENTIFICATION/CHARGING :	
A T & T CAMA FORMAT	F2378
ADMINISTRATION :	
CALL CODE 009,003 & 121 ASSIGNMENT VIA TRANSLATION	F2759
SWITCHING AND TRANSLATIONS :	
DATAPATH AMA FORMAT-CALL CODES 072,117,121	F2793
NUMBER IDENTIFICATION/CHARGING :	
BC AMA INTERLATER WATS CALL CODE III	F5684

Package	NTX098AA03 BELLCORE CAMA FORMAT
Feature set	ADMINISTRATION
Feature	CALL CODE 009,003 & 121 ASSIGNMENT VIA TRANSLATION
Feature no	F2759

FEATURE SYNOPSIS

This feature adds AMA pretranslation table which gives the Telco the ability to specify, by datafill, the generation of call codes 009 (411 directory assistance), 033 (555 directory assistance), and 121 (datapath terminating access record) on a per translation basis.

FEATURE DESCRIPTION

Prior to this feature generation of Bellcore AMA records for DA calls 411 (call code 009) and 555 (call code 033) by turning of or off the corresponding parameters in AMAOPT table. This feature adds table AMAPRT, as a subtable of table STDPRTCT, which, when properly datafilled by Telco, will generate call codes 009 and 033 on a per translation basis. This feature also adds a new call code 121 (datapath terminating access record). Without AMA pretranslation this call could only be recorded as call code 119 (terminating access record).

This feature covers both POTS and IBN lines and supports the following trunk groups: SC, OC, ATC, P2, PX, IBNT1, IBNT2.

Ref: FDOC BR0759
LSSGR Section 8.1

Package	NTX098AA03 BELLCORE CAMA FORMAT
Feature set	SWITCHING AND TRANSLATIONS
Feature	DATAPATH AMA FORMAT-CALL CODES 072,117,121
Feature no	F2793

FEATURE SYNOPSIS

This feature allows DMS-100 to provide call codes 072 and 117 for datapath and interlata datapath calls respectively and output AMA (automatic message accounting) data as referenced in lata switching systems generic requirements (LSSGR), December 1984 version, Section 8.1 - Billing.

FEATURE DESCRIPTION

Call code 072 is required for datapath calls originated from a data unit. Call code 072 supports structure codes 00190 answered, 00191 unanswered, and 00194 long duration. Other structure codes 00192, 00193 and 00195 are not supported by this feature.

Call code 117 is required for equal access billing ie, generating originating local access and transport area (lata) access for datapath calls. Call code 117 supports structure codes 00645 interlata and 00647 interlata, long duration. Other structure codes 00646 and 00648 are not supported by this feature.

The call codes are activated automatically when a data unit originate a billable call, call code 072 replaces call code 006 for datapath calls made via the public switched network. Call code 117 replaces 110 for datapath calls made via the equal access network.

Ref:

BR0793

Package	NTX098AA03 BELLCORE CAMA FORMAT
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	BC AMA INTERLATER WATS CALL CODE III
Feature no	F5684

FEATURE SYNOPSIS

This feature allows DMS-100 to provide call code III (interLATA, WATS, station details).

FEATURE DESCRIPTION

Call code III (CC III) is required for equal access billing i.e., generating originating local access and transport area (LATA) access records. If a interlata carrier/international carrier (IC/INC) provide services such as outwats, the appropriate interLATA WATS record similar to the non-interLATA record is generated. The interLATA record is necessary because additional carrier connect details are included. This feature allows DMS-100 to provide CC III with no special treatment and output the appropriate AMA data.

Ref: BC1698
LSSGR 8.1 - Billing
NTP 297-1001-119 AMA Reference Manual

NTX100AA20 Status: RTM INTEGRATED BUSINESS NETWORKS - BASIC (I

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Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT CALL SELECTION
Feature no	F0365

DESCRIPTION

This feature enables an attendant to answer incoming calls either:

- in the order they are received, regardless of call type, or
- by manually selecting a desired incoming call type

Attendant call selection is only possible if Incoming Call Identification (ICI) keys are assigned to call categories. If no ICI keys are assigned, the only method of answering calls is by depressing the appropriate loop key.

Incoming calls to the attendant are placed in a queue and presented to idle consoles on a first in, first out basis (Reference V0433 "Uniform Call Distribution"). When an attendant console becomes available:

- the source lamp on the first idle loop on the console flashes to indicate a call requiring attendant answer. The console buzzes momentarily to alert the attendant of a call waiting for answer.
- if equipped, the ICI lamps associated with all call types waiting in the queue also turn on.

The attendant can either answer the oldest call in the queue by depressing the appropriate loop key or select a specific call type by depressing an ICI key whose associated lamp is on or flashing.

If the attendant depresses the loop key whose source lamp is flashing, the appropriate ICI (if equipped) remains on. All the other lamps, if previously on, turn off. The attendant can now answer with an appropriate phrase.

When the attendant depresses the loop key, the source lamp turns from flashing to on (steady) and the destination lamp is updated to reflect the dequeued call type.

The attendant can dispose of the call in an appropriate manner.

The following shows source and destination lamp states after the attendant has depressed either a loop or ICI key to answer a call.

Type of Incoming Call -----	Source Lamp -----	Destination Lamp -----
1. Attendant (Dial 0)	ON	OFF
2. Call Forward to Attendant	ON	OFF
3. Intercept	ON	OFF
4. Incoming Trunk Call (see note)	ON	OFF
5. Recall - Camp On	ON	120 IPM
6. Recall - Call Waiting	ON	120 IPM
7. Recall - No Answer	ON	60 IPM
8. Flash, Call Transfer to Attendant	ON	ON

Note: This category includes calls to the listed directory number(s), FX calls, etc.

If the attendant depresses an ICI key whose lamp is ON or flashing, the queue is searched for the oldest call of the type selected and:

- The selected call type ICI lamp remains on.
- All other ICI lamps turn off.
- The source lamp associated with the selected call on the loop turns on.
- The destination lamp is updated to reflect the call type selected.
- The answered call is connected to the attendant.

The attendant can now dispose of the call in the appropriate manner.

The attendant can also depress an idle loop key, depress a loop key associated with a held call, depress the position busy key (if equipped), etc. If the attendant depresses any of these keys instead of answering the incoming call:

- The source lamp associated with the loop turn off and the loop is idled.
- All ICI lamps which had been on, turn off.

The attendant can now originate a call, busy verify, talk to the parties if the loop depressed has a previously held call on it, etc.

The following lists the incoming call identification categories which can be assigned to attendant consoles.

INCOMING CALL IDENTIFICATION CATEGORIES

ICI CATEGORY	DESCRIPTION
-----	-----
SPECIFIC INCOMING OR 2 WAY TRUNK GROUP	INCOMING CALL TO LISTED DI- RECTORY NUMBER, TIE TRUNK, INWATS, FX. NOTE: THERE CAN BE SEVERAL LDN TIE TRUNK GROUPS, ETC., EACH WITH ITS OWN ICI.
ATTENDANT	CALLS ORIGINATED BY IBN STATIONS (DIAL 0, FLASH). SEE ALSO BELOW FOR MANUAL ORIGINATIONS AND FULLY RESTRICTED STATIONS.
TIMED RECALL - DON'T ANSWER	AUTOMATIC DON'T ANSWER RECALLS. DOES NOT INCLUDE CALL WAIT- ING, CAMP-ON.
TIMED RECALL - CAMP-ON	AUTOMATIC RECALL OF UNANSWERED CAMPED-ON CALLS.
TIMED RECALL - CALL WAITING	AUTOMATIC RECALL OF UNANSWERED CALL WAITED CALLS.
CALL FORWARDING	CALLS FORWARDED TO THE ATTENDANT VIA THE CALL FORWARD FEATURE.
CALL FORWARD - DON'T ANSWER	CALLS FORWARDED TO THE ATTENDANT VIA CALL FORWARDING-DON'T AN- SWER FEATURE.
CALL FORWARD - BUSY	CALLS FORWARDED TO THE ATTENDANT VIA CALL FORWARDING-BUSY FEA- TURE.
INTERCEPT	INTERCEPTED CALLS TO THE ATTEND- ANT.
INTERCEPT - ATTENDANT CONTROL OF TRUNK GROUP ACCESS (FUTURE FEATURE)	CALLS INTERCEPTED DUE TO AT- TENDANT APPLICATION OF CON- TROL ON A TRUNK GROUP.
INTERPOSITION CALL (FUTURE FEATURE)	CALLS FROM OTHER ATTENDANT CONSOLES.
SERIAL CALL (FUTURE FEATURE)	ANY RECALL OF A SERIAL CALL.

MANUAL ORIGINATION

AN ORIGINATION (OFF-HOOK) BY A
MANUAL STATION. THESE ARE
ROUTED TO THE ATTENDANT.

FULLY RESTRICTED STATION
ATTENDANT ACCESS

A FULLY RESTRICTED STATION
HAS DIALED "0".

CONFERENCE (FUTURE FEATURE)

A CONFEREE HAS FLASHED OR
FLASHED AND DIALED "0".

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT CAMP-ON
Feature no	F0366

DESCRIPTION

ATTENDANT COMPLETED INCOMING CALLS TO BUSY STATIONS ARE PLACED IN WAITING (OR CAMPED-ON) CONDITION. WHEN THE STATION IS IDLE, IT IS AUTOMATICALLY RUNG AND CONNECTED TO THE WAITING CALL. A TONE MAY BE PROVIDED TO THE BUSY STATION INDICATING THAT A CALL IS WAITING. THE CALLED PARTY MAY FLASH HIS SWITCH HOOK TO CONNECT TO THE CAMPED-ON CALL. HE MAY RETURN TO THE ORIGINAL CALL BY FLASHING THE SWITCH HOOK AGAIN.

CAMP-ON IS AN ATTENDANT FEATURE.

FEATURE RESTRICTIONS _____

ONLY 1 CALL CAN BE CAMPED-ON TO A BUSY STATION. TO ANSWER A CAMPED-ON CALL, THE CALLED STATION CAN EITHER FLASH OR GO ON-HOOK.

CAMP-ON AND CALL WAITING ARE MUTUALLY EXCLUSIVE. A STATION CAN HAVE EITHER CALL WAITING OR CAMP-ON, NOT BOTH. STATION RESTRICTIONS STILL APPLY WITH CAMP-ON E.G. CAMP-ON IS DISALLOWED IF A STATION IS RESTRICTED FROM RECEIVING CERTAIN TYPES OF INCOMING CALLS.

CAMP-ON WITH TONE IS NOT COMPATIBLE WITH STATIONS WHICH HAVE NO DOUBLE CONNECT (NDC) ASSIGNED.

CAMP-ON IS APPLICABLE TO LDN, EPSCS, TIE TRUNK TYPE INCOMING CALLS ONLY. IT IS NOT APPLICABLE TO INTERNAL CUSTOMER GROUP (SERVED BY DMS) CALLS.

FEATURE USE _____

WHEN AN ATTENDANT ATTEMPTS TO EXTEND A CALL TO A LINE AND THE LINE IS BUSY, THE ATTENDANT HEARS 2 SECONDS OF BUSY TONE AND THE DESTINATION LAMP FLASHES. THE ATTENDANT CAN GIVE A BUSY REPORT. IF THE CALLER WISHES TO WAIT, THE ATTENDANT SIMPLY DEPRESSES THE RELEASE OR HOLD/RELEASE KEY. THE CALLER IS QUEUED FOR THE BUSY STATION. IF A CALL IS ALREADY CAMPED-ON FOR THE BUSY LINE, THE ATTENDANT HEARS 2 SECONDS OF REORDER TONE AND THE DESTINATION LAMP WILL BE ON FOR 2 SECONDS, THEN TURN OFF. THIS ALSO APPLIES IF CAMP-ON IS NOT PERMITTED FOR THE LINE. THE ATTENDANT CAN THEN EITHER DIAL ANOTHER STATION OR RELEASE THE CALL.

FEATURE INTERACTION _____

CAMP-ON WILL NOT APPLY TO BUSY VERIFICATION BY THE ATTENDANT.

CAMP-ON DOES NOT APPLY TO ATTENDANT ORIGINATED CALLS. IF THE STATION IS ASSIGNED CALL FORWARD BUSY, THE ATTENDANT WILL BE FORWARDED.

IF THE STATION HAS CAMP-ON AND CALL FORWARD-BUSY AND THE ATTENDANT EXTENDS A CALL TO THE STATION, CAMP-ON APPLIES, NOT CALL FORWARD-BUSY.

IF THE CALLED STATION HAS ACTIVATED CALL FORWARD UNIVERSAL OR INTRAGROUP, THE CAMP-ON FEATURE IS DISABLED FOR THE DURATION THAT EITHER OF THESE FEATURES IS ACTIVE.

IF THE CALLED STATION HAS BOTH CAMP-ON AND 3-WAY CALLING, THE 3-WAY CALLING FEATURE IS DISABLED WHILE A CALL IS CAMPED-ON AND WHILE ALTERNATING BETWEEN PARTIES. IF A CALL IS NOT CAMPED-ON OR HELD, A FLASH FROM THE BUSY STATION WILL CAUSE SPECIAL DIAL TONE TO BE APPLIED. THE USER CAN NOW ACCESS THE 3-WAY CALLING FEATURE.

CAMP-ON AND CALLING LINE IDENTIFICATION WITH FLASH (CLF) ARE INCOMPATIBLE FEATURES. IF A LINE IS ASSIGNED CLF (STATION FEATURE), CAMP-ON (CUSTOMER GROUP FEATURE) WILL NOT APPLY.

CAMP-ON IS INCOMPATIBLE WITH THE FOLLOWING:

- CALL PICK-UP. CAMPED-ON CALLS CANNOT BE ANSWERED BY THE CALL PICK UP FEATURE.
- A CALLED LINE WHICH IS IN THE RINGING, DIALING, LOCK-OUT OR HELD STATE (ANY UNSTABLE STATE).

CAMP-ON TONE _____

WHEN A CALL IS CAMP-ON, THE CALLED STATION MAY HEAR CAMP-ON TONE. THIS CONSISTS OF 440 HZ AT -17 DBM AND IS APPLIED FOR 300 MSEC ONCE ONLY. THE APPLICATION OF CAMP-ON TONE (COT) WILL BE A CUSTOMER GROUP PARAMETER. WHILE CAMPED-ON, THE CALLING PARTY HEARS EITHER NOTHING (SILENCE) OR IS SWITCHED TO MUSIC ON HOLD (FUTURE FEATURE).

CAMPED-ON TONE IS PROVIDED VIA A SERVICE CIRCUIT (NT3X68AC). AUTOMATIC ATTENDANT RECALL _____

THE CAMPED-ON CALL IS ROUTED TO THE ATTENDANT IF THE CALLED STATION HAS NOT ANSWERED WITHIN X SECONDS. THIS INTERVAL IS MODIFIABLE FROM 12 TO 60 SECONDS, IN 1 SECOND INCREMENTS.

THE ATTENDANT CAN THEN AGAIN CAMP-ON THE CALL. IF CAMP-ON TONE IS PROVIDED, TONE WILL AGAIN BE HEARD BY THE CALLED STATION.

CAMP-ON FEATURE ASSIGNMENT _____

THE ATTENDANT CAMP-ON FEATURE (ACO) WILL BE A CUSTOMER GROUP PARAMETER. WHEN PROVIDED, IT WILL APPLY ONLY TO THOSE STATIONS NOT ASSIGNED CALL WAITING OR CALLING LINE IDENTIFICATION WITH FLASH.

IF THE CUSTOMER GROUP PARAMETER IS CAMP-ON WITH TONE, CAMP-ON WILL NOT APPLY TO STATIONS ASSIGNED OPTION NO DOUBLE CONNECT.

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
 Feature set ATTENDANT FEATURES
 Feature ATTENDANT CONFERENCE (MAXIMUM SIX CONFEREES)
 Feature no F0367

DESCRIPTION

AN ATTENDANT MAY ESTABLISH A CONFERENCE CALL WHICH INCLUDES UP TO 6 PARTIES EXCLUDING THE ATTENDANT. THE CONFERENCE WILL BE SET UP USING A CONFERENCE KEY ON THE CONSOLE WHEN A REQUEST IS RECEIVED FROM A CALLER. AS MANY AS SIX OF THE PARTIES MAY BE EXTERNAL (E.G. ACCESSED THROUGH TRUNKS TO OTHER NETWORKS OR OTHER HUBS ON THE IBN), PROVIDED AT LEAST ONE OF THE TRUNKS RETURN DISCONNECT SUPERVISION.

FEATURE ACTIVATION _____

TO ESTABLISH A 6 PORT CONFERENCE CALL, 1 OF THE FEATURE KEYS AND LAMPS ON THE CONSOLE MUST BE ASSIGNED TO THIS FEATURE. THIS IS SEPARATE FROM THE CONF ICI WHICH MAY BE ASIGNED TO THE CONSOLE, AS AN OPTION.

ATTENDANT KEYING AND CONSOLE LAMP STATES

THE ATTENDANT WILL ESTABLISH A 2 PORT CALL BETWEEN A SOURCE AND DESTINATION AS DESCRIBED ELSEWHERE.

TO ADD A THIRD PARTY AND ESTABLISH A CONFERENCE CALL, THE ATTENDANT WILL DEPRESS THE CONF (CONFERENCE) KEY. THIS WILL CAUSE:

- THE CONF LAMP TO TURN ON
- THE SOURCE AND DESTINATION TO BE MOVED TO THE 6 PORT CONFERENCE BRIDGE
- THE ATTENDANT TO BE CONNECTED TO THE 6 PORT VIA THE SRC PORT ON THE 3 PORT
- THE EXCL SRC OR EXCL DEST LAMP TO TURN OFF (IF ONE OF THESE HAD BEEN ON). THE ATTENDANT CAN NOW TALK TO THE CONFEREES.
- THE DEST LAMP TO TURN OFF.

THE ATTENDANT WILL NOW KEY THE NUMBER FOR THE PROSPECTIVE THIRD CONFEREE. UPON KEYING THE FIRST DIGIT:

- THE DEST LAMP WILL TURN ON
- THE EXCL SRC LAMP WILL TURN ON REGARDLESS OF WHETHER THE SECRECY OPTION IS SET (THE ATTENDANT IS STILL CONNECTED TO THE 6 PORT HOWEVER PCM IS DISABLED).
- THE 2 PARTIES PREVIOUSLY ADDED TO THE CONFERENCE BRIDGE

CAN TALK.

UPON CALLED PARTY ANSWER, THE ATTENDANT CAN TALK PRIVATELY TO THE PROSPECTIVE THIRD CONFEREES.

TO ADD THE CALLED PARTY TO THE CONFERENCE, THE ATTENDANT WILL DEPRESS THE CONF KEY. THIS WILL CAUSE:

- THE CALLED PARTY TO BE MOVED TO THE 6 PORT CONFERENCE BRIDGE
- PCM FOR THE ATTENDANT TO THE 6 PORT TO BE ENABLED
- THE CONF LAMP TO REMAIN ON
- THE DEST LAMP TO TURN OFF
- THE EXCL SRC LAMP TO TURN OFF

THE ATTENDANT CAN NOW TALK TO THE CONFEREES.

TO ADD A FOURTH AND FIFTH PARTY OF THE CONFERENCE, THE ATTENDANT WILL REPEAT THE PROCESS DESCRIBED ABOVE. ATTENDANT KEYING AND CONSOLE LAMP STATES WILL BE AS DESCRIBED PREVIOUSLY.

THE MAXIMUM NUMBER OF CONFEREES, INCLUDING THE ATTENDANT, IS 6. THE ATTENDANT CAN CALL A SIXTH (EXCLUDING THE ATTENDANT) PARTY. HOWEVER, BOTH THE ATTENDANT AND THIS PARTY CANNOT BE ADDED TO THE CONFERENCE. WHEN THE ATTENDANT DEPRESSES THE HOLD KEY, THE SIXTH PARTY WILL BE ADDED AND THE CONFERENCE WILL BE PLACED ON HOLD. TO REENTER THE CONFERENCE THE ATTENDANT CAN DEPRESS THE LOOP KEY. THE LAST CONFEREE ADDED WILL BE PLACED ON THE DEST SIDE. THE SRC PORT OF THE ATTENDANT WILL BE CONNECTED TO THE CONFERENCE. ALL CONFEREES AND THE ATTENDANT CAN TALK.

TO HOLD THE CONFERENCE CALL, THE ATTENDANT WILL BE ABLE TO:

- DEPRESS HOLD. THE CONFERENCE CALL WILL BE HELD. THE CONSOLE LAMP STATES WILL BE:
 - CONF LAMP TURNS OFF
 - SRC FLASHES AT 20 IPM
 - DEST IS OFF
- DEPRESS ANOTHER LOOP KEY. THE CONFERENCE CALL WILL BE HELD. THE LAMP STATES WILL BE AS ABOVE.

TO RELEASE THE CONFERENCE CALL FROM THE POSITION, THE ATTENDANT CAN:

- DEPRESS THE RLS KEY

IF THE ATTENDANT HITS THE RLS KEY WITH THE CONFERENCE ON THE SRC SIDE AND A PROSPECTIVE CONFEREE ON THE DEST, THE DEST WILL BE ADDED TO THE CONFERENCE. THE LAMP STATES WILL BE:

- CONF TURNS OFF - SRC TURNS OFF - DEST IS OFF - EXCLUDE SRC IS OFF

THE LOOP WILL BE IDLED.

- DEPRESS RLS SRC KEY. THE LAMP STATES WILL BE THE SAME WITH THE EXCEPTION THAT THE DEST LAMP STAYS ON.

FLASH RECALL _____

A CONFEREE WHO IS CONNECTED TO DMS WILL BE ABLE TO RECALL THE ATTENDANT BY FLASHING. THIS WILL CAUSE THE CONFEREE TO BE REMOVED FROM THE CONFERENCE. THE CONFERENCE CALL WILL APPEAR ON THE SRC SIDE OF THE LOOP AND THE CONFEREE WHO FLASHED ON THE DEST SIDE. LAMP STATES PRIOR TO ANSWER WILL BE:

- CONF ICI ON (IF ASSIGNED) - SRC FLASHES 120 IPM - DEST FLASHES AT 120 IPM - RLS OFF

THE ATTENDANT ANSWERS BY HITTING THE LOOP KEY.

AFTER ANSWER, THE LAMP STATES WILL BE:

- CONF ICI ON - SRC ON - DEST ON - EXCLUDE SRC LAMP ON - RLS OFF

IF THE CONFERENCE HAD BEEN HELD, THE CONF ICI WOULD NOT TURN ON.

EVEN IF THE SECRECY OPTION IS NOT SET, THE EXCL SRC LAMP WILL BE ON AND THE ATTENDANT CAN TALK PRIVATELY TO THE DESTINATION. TO REUTNR THE CONFEREE TO THE CONFERENCE, THE ATTENDANT CAN DEPRESS CONF. THIS KEYING ACTION IS ALSO REQUIRED BEFORE THE ATTENDANT CAN KEY AND ADD ANOTHER DESTINATION. THE ATTENDANT CAN ALSO RELEASE THE CONFEREE ON THE DEST SIDE BY DEPRESSING RLS DEST. THE CONFEREE CAN ALSO GO ON-HOOK.

DEPRESSING THE LOOP KEY (SAME LOOP ON WHICH CALL HAS BEEN ANSWERED WHEN EITHER THE SRC OR DEST IS EXCLUDED) WILL BE IGNORED. IF THE ATTENDANT DEPRESSES HOLD OR ANOTHER LOOP KEY, THE CONFERENCE ON THE SRC SIDE AND THE RECALLING CONFEREE WILL BE HELD, IN A CONFERENCED MODE. IF THE ATTENDANT DEPRESSES RLS, THE CONFERENCE WILL BE RELEASED FROM THE SRC SIDE, THE RECALLING CONFEREE, IF STILL OFF-HOOK, WILL BE PUT ON ONE OF THE IDLE PORTS OF THE 6 PORT CONFERENCE. IF AN IDLE PORT IS NOT AVAILABLE, ONCE RLS IS DEPRESSED, THE PARTY ON THE DEST SIDE WILL BECOME THE SRC AND WILL BE CONNECTED TO THE ATTENDANT. THE PRECEDING ALSO APPLIES IF THE ATTENDANT DEPRESSES RLS SRC.

VALID CONFERENCE CONNECTIONS INCLUDE IBN GROUP STATIONS, REGULAR LINES, FX TRUNKS, TIE TRUNKS, TELCO OPERATORS, REGULAR INCOMING AND OUTGOING TRUNKS WITH THE FOLLOWING RESTRICTIONS. AT THE TIME THE ATTENDANT DEPRESSES RLS, OR, RLS SRC A CHECK MUST BE MADE OF ALL CONFEREES. IF NONE OF THE CONFEREES IS AN IBN STATION OR LINE DIRECTLY SERVED BY DMS, OR A TRUNK WHICH RETURNS DISCONNECT SUPERVISOR TO DMS, THE CONFERENCE CALL WILL BE DISALLOWED AND TAKEN DOWN. THIS IS REQUIRED TO AVOID CON-

NECTIONS WHERE ALL CONFERENCEES ARE TRUNKS AND DISCONNECT SUPERVISION IS NOT RECEIVED.

IF THE CONFERENCE IS HELD ON LOOP EITHER BY THE ATTENDANT DEPRESSING THE HOLD KEY OR ANOTHER LOOP KEY, THE ATTENDANT BECOMES THE OWNER OF THE CONFERENCE. WHEN ALL CONFERENCEES WITH DISCONNECT SUPERVISION, I.E. EITHER DMS STATIONS OR TRUNKS (WITH DISCONNECT SUPERVISION), LEAVE THE CONFERENCE, ANY TRUNKS WITHOUT DISCONNECT SUPERVISION WILL REMAIN CONNECTED TO THE BRIDGE. TO INDICATE TO THE ATTENDANT THAT NO CONNECTIONS WITH DISCONNECT SUPERVISION EXIST, THE SRC LAMP WILL FLASH AT 120 IPM. THE ATTENDANT CAN CHECK THE BRIDGE AND IF NO PARTIES ARE PRESENT, RELEASE THE BRIDGE BY EITHER DEPRESSING RLS OR RLS SRC WHICH WILL IDLE THE CONFERENCE BRIDGE. THIS APPLIES FOR CALLS QUEUED FOR THE ATTENDANT AS WELL.

THE STATION CAN ALSO LEAVE A CONFERENCE CALL BY GOING ON-HOOK LONGER THAN THE FLASH INTERVAL (500/2500 SETS).

THE ATTENDANT WILL NOT BE ABLE TO BUSY VERIFY A STATION OR TRUNK INVOLVED IN A CONFERENCE. REFERENCE FEATURE F1173, "BUSY VERIFICATION - LINE" OR F0771, "BUSY VERIFICATION - TRUNK". (A FORCED DISCONNECT WILL BE DEFINED TO DEAL WITH THIS FEATURE).

FEATURE INTERACTION _____

WHEN A CONFERENCE CALL IS HELD ON LOOP, THE ATTENDANT CAN REENTER THE CALL AT ANY TIME BY DEPRESSING THE LOOP KEY. THE LOCKOUT FEATURE F0376 WILL NOT APPLY TO A SIX-PORT CONFERENCE CALL.

DELAYED OPERATION AND CONFERENCE WILL BE INCOMPATIBLE FEATURES. IF THE CALLING PARTY REQUESTS A CONFERENCE CALL, THE ATTENDANT CAN PROCESS THE REQUEST IN THE FOLLOWING WAYS:

- THE CALLING PARTY (SRC) MUST STAY OFF-HOOK WHILE THE ATTENDANT ESTABLISHES THE REQUESTED CONNECTIONS.
- IF THE CALLING PARTY DOES NOT WISH TO WAIT, THE ATTENDANT MUST RELEASE (RLS SRC OR RLS KEYS) THE CALLING PARTY. THE ATTENDANT THEN ESTABLISHES THE CONFERENCE CALL AND RECALLS THE CALLING PARTY LAST. DEPRESSING SIG SRC WILL NOT WORK.
IF THE ATTENDANT IS TALKING TO ONE PARTY I.E. SRC AND DIALS A DEST, WHERE A RESTRICTION WILL OCCUR THE ATTENDANT WILL HEAR BUSY TONE. IF THE ATTENDANT HAS A CONFERENCE AS THE SRC, NO CHECKING OF LRC'S WILL BE DONE, E.G. A FULLY RESTRICTED STATION CAN BE CONNECTED WITH A PREVIOUSLY RESTRICTED TERMINATION.

ATTENDANT CONFERENCE IS INCOMPATIBLE WITH CAMP-ON AND CALL WAITING. IF THE CALLED NUMBER IS BUSY, THE ATTENDANT WILL HEAR BUSY TONE. IF THE ATTENDANT DEPRESSES THE CONF KEY TO ADD

THE BUSY DESTINATION TO THE CONFERENCE, THE KEYING ACTION WILL BE IGNORED. REFERENCE INVALID KEYING.

IF 1 OR MORE LEGS OF THE CONFERENCE CALL IS CHARGEABLE, THE CALLING DN WRITTEN TO TAPE WILL BE THE CUSTOMER GROUP BILLING DN. REFERENCE F0378 MULTI-LISTED DIRECTORY NUMBERS, AND F0425 STATION MESSAGE DETAIL RECORDING.

EACH LEG WRITTEN TO TAPE WILL INCLUDE THE SERVICE FEATURE CODE ASSIGNED TO CONFERENCE.

CDR MAY BE APPLICABLE TO 1, SEVERAL OR ALL LEGS OF THE CALL, EVEN IF THESE ARE NOT CHARGEABLE.

SMDR MAY BE APPLICABLE. ACCOUNT CODE ENTRY MAY APPLY. REFERENCE F0425.

STATION MESSAGE DETAIL RECORDING

THE ATTENDANT CAN INPUT AN ACCOUNT CODE FOR EACH CALLED PARTY:

- AFTER DIALING THE DESTINATION (THE DEST IS RINGING OR HAS ANSWERED) BUT IS NOT YET PART OF THE CONFERENCE.
- BEFORE DIALING A NEW DESTINATION (ALL PARTIES CALLED THUS FAR ARE PART OF THE CONFERENCE. THEREFORE THE ACCOUNT INPUT WILL APPLY TO THE NEXT DESTINATION). FOR VO#12, IF THE ATTENDANT DOES NOT FOLLOW THE ACCOUNT WITH A DESTINATION, THE ACCOUNT ENTERED WILL BE IGNORED AND TREATED AS THOUGH IT CANNOT BE ASSOCIATED WITH A CALL. IN THE EVENT THAT A WRONG NUMBER IS KEYED IN, THE ATTENDANT CAN HIT RLS DEST.

FEATURE RESTRICTIONS

DEPRESSING THE CONFERENCE KEY BEFORE BOTH AN ACTIVE SOURCE AND DESTINATION EXIST ON A LOOP IS INVALID AND WILL BE IGNORED. THE CONF LAMP WILL NOT TURN ON.

THE CALLED PARTY ON THE DET SIDE OF THE LOOP MUST ANSWER BEFORE THE ATTENDANT CAN ADD THIS PARTY TO THE CONFERENCE. DEPRESSING THE CONF KEY BEFORE THE DESTINATION HAS ANSWERED WILL BE IGNORED. THIS APPLIES WHERE DMS SERVES (VIA LM OR RLM) THE CALLED PARTY.

WHERE THE CALLED PARTY IS REACHED VIA AN OUTGOING (OR 2-WAY) TRUNK, DMS WILL NOT CHECK FOR ANSWER SUPERVISION BECAUSE:

- THE DISTANT END MAY NOT RETURN ANSWER SUPERVISION
- EVEN IF THE DISTANT END NORMALLY RETURNS ANSWER, THE CALLED

NUMBER MAYBE FNT (FREE NUMBER TERMINATING). CALLS TO SUCH NUMBERS, IF THE INCOMING CALL IS LOCAL, DO NOT RETURN ANSWER SUPERVISION UPON CALLED ANSWER.

INSTEAD, IT IS UP TO THE ATTENDANT (SEE BELOW) TO WAIT FOR CALLED ANSWER AND ANNOUNCE THE NATURE OF THE CALL BEFORE ADDING THIS PARTY TO THE CONFERENCE. ONCE A PARTY IS ADDED TO THE CONFERENCE BRIDGE, THERE IS NO WAY THAT THE ATTENDANT CAN REMOVE THE PARTY. THEREFORE, ALL PARTIES ALREADY CONNECTED TO THE CONFERENCE BRIDGE WOULD BE LISTENING TO AUDIBLE RINGBACK TONE, BUSY TONE, REORDER TONE, ETC.

HOWEVER, IF THE ATTENDANT TRIES TO ADD A PARTY TO THE CONFERENCE WHILE DMS IS:

- OUTPULSING - STILL TIMING FOR END OF DIALING

THE KEYING ACTION (CONF KEY DEPRESSION) WILL BE IGNORED. DMS MUST BE IN AN ACTIVE SUPERVISION STATE.

INTERPOSITION CALLING AND CONFERENCE ARE INCOMPATIBLE. THE FOLLOWING ARE ALLOWED/DISALLOWED ACTIONS:

- ATTENDANT IS ESTABLISHING A CONFERENCE CALL. DEST IS IDLE. ATTENDANT CAN PLACE AN INTERPOSITION CALL ON DEST SIDE, BUT CANNOT TRANSFER THE CONFERENCE CALL ON THE SRC SIDE.
- ATTENDANT HAS ANSWERED A RECALL FROM A CONFEREE. THE CONFEREE WHO FLASHES OR FLASHED AND DIALED "0" IS ON THE DEST SIDE. THE CONFERENCE IS ON THE SRC SIDE. TO CALL ANOTHER ATTENDANT USING THE SAME LOOP, THE ATTENDANT MUST FIRST DEPRESS CONF TO CLEAR THE DEST. THIS MAY NOT BE WHEN THE RECALLING CONFEREE HAD IN MIND. INSTEAD, IT IS SUGGESTED THAT THE ATTENDANT PLACE AN INTERPOSITION CALL USING AN IDLE LOOP OR RELEASE THE CONFERENCE FROM THE SRC FIRST, ETC., IF CALL HANDLING INFORMATION IS REQUIRED.

IF THE ATTENDANT ATTEMPTS TO ESTABLISH A CONFERENCE CALL AND AN IDLE 6 PORT IS NOT AVAILABLE, THE CONF LAMP WILL MOMENTARILY FLASH, THEN TURN OFF.

THE CALL WAITING F0451 OR ATTENDANT CAMP-ON F0366 FEATURES WILL NOT BE ACTIVATED FOR A PARTY INVOLVED IN A CONFERENCE.

IT WILL NOT BE POSSIBLE TO ACTIVATE THE THREE WAY CALLING FEATURE (IF LINE IS ASSIGNED THIS FEATURE) WHILE THE PARTY IS INVOLVED IN A CONFERENCE CALL.

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
 Feature set ATTENDANT FEATURES
 Feature ATTENDANT CONTROL OF TRUNK GROUP ACCESS
 Feature no F0368

DESCRIPTION

 THIS FEATURE PERMITS THE ATTENDANT TO CONTROL ACCESS BY ALL STATIONS TO VARIOUS TRUNK GROUPS BY OPERATING CORRESPONDING KEYS.

WHEN SUCH CONTROL IS ACTIVATED ON A TRUNK GROUP, STATIONS ARE RESTRICTED FROM DIAL ACCESS TO THE TRUNK GROUP. INTERCEPT TREATMENT WHILE CONTROL IS ACTIVE CAN BE SPECIFIED ON A CUSTOMER GROUP BASIS.

RESTRICTIONS _____

1. THIS IS STRICTLY AN ATTENDANT CONSOLE FEATURE.
2. FOR VO#12, ONLY THE FEATURE AS DESCRIBED HERE WILL BE SUPPORTED.
3. ATTENDANT CONTROL OF TRUNK GROUP ACCESS WILL BE RESTRICTED TO TRUNK GROUPS DIRECTLY TERMINATED ON DMS-100.
4. THIS FEATURE WILL APPLY TO ONE WAY OUTGOING AND TWO WAY TRUNK GROUPS ONLY. IT CAN ONLY BE APPLIED TO TRUNK GROUPS WHICH BELONG TO THE CUSTOMER GROUP.

FEATURE USE _____

EACH TRUNK GROUP THE ATTENDANT IS TO HAVE CONTROL OVER MUST BE ASSIGNED TO A FEATURE KEY ON THE CONSOLE. EACH FEATURE KEY HAS AN ASSOCIATED LAMP.

TO ACTIVATE CONTROL OF A PARTICULAR TRUNK GROUP, THE ATTENDANT DEPRESSES THE KEY ASSIGNED TO THE TRUNK GROUP. TO DEACTIVATE CONTROL, THE ATTENDANT DEPRESSES THE SAME KEY AGAIN. THE FOLLOWING FIGURE ILLUSTRATES CONSOLE LAMP STATES ASSOCIATED WITH THE FEATURE.

TENDANT	TRUNK GROUP LAMP	LAMP STATES PER CALLER	TRUNK GROUP ON-HOOK	TRUNK GROUP QUEUING ALLOWED	AT-
STATUS	CONTROL(ON/OFF)	STATES	TREATMENT	ALLOWED	
_____	_____	_____	_____	_____	

AVAILABLE	OFF	OFF	ROUTE CALL	NO	AVAILABLE
ON		60 IPM	INTERCEPT	NO BUSY	OFF
ON	REORDER	YES	BUSY	ON	120 IPM
INTERCEPT	NO				

NOTES _____

TRUNK GROUP STATUS: AVAILABLE MEANS 1 OR MORE TRUNKS IN THE PARTICULAR TRUNK GROUP ARE IDLE.

CONTROL: ON MEANS THE ATTENDANT HAS ACTIVATED CONTROL OF THE TRUNK GROUP. OFF MEANS ATTENDANT CONTROL IS NOT ACTIVE.

CALLER TREATMENT: REFERS TO THE USUAL TREATMENT GIVEN A CALLER WHEN DMS-100 CANNOT COMPLETE THE CALL. SEE FEATURE REQUIREMENTS.

ON-HOOK QUEUING (WITH RINGBACK) ALLOWED: F0760 "ON-HOOK QUEUING".

FEATURE REQUIREMENTS _____

IN THIS DESCRIPTION, THIS FEATURE WILL BE REFERRED TO AS TRUNK ACCESS CONTROL (TAC). TAC WILL BE AN IBN CUSTOMER GROUP PARAMETER.

TRUNK GROUP BUSY STATUS CAN BE DISPLAYED ON ATTENDANT CONSOLES WITHOUT THE ATTENDANTS BEING ABLE TO ACTIVATE/DEACTIVATE CONTROL. THIS APPLIES IF ATTENDANT CONTROL IS NOT AN IBN CUSTOMER GROUP PARAMETER. THIS FEATURE IS DESCRIBED IN F0371 "TRUNK GROUP BUSY LAMPS".

OUTGOING AND TWO WAY TRUNK GROUPS, TO WHICH LRC AND LSC ARE APPLICABLE, ALSO HAVE AN ALTERNATE LRC AND LSC (ALRC AND ALSC) FLAG FIELD. WHEN TAC IS ACTIVATED, ACCESS TO A CONTROLLED TRUNK GROUP BY A STATION OR INCOMING TRUNK GROUP WILL DEPEND ON THE STATION'S OR INCOMING TRUNK GROUP'S LRC OR LSC CORRESPONDING TO THE ALRC OR ALSC FLAG FIELD BIT POSITION. THEREFORE, A CUSTOMER CAN SELECTIVELY ALLOW/DENY ACCESS TO A TRUNK GROUP AFFECTED BY TAC E.G. NOT ALL CALLERS ARE BLOCKED.

WHEN TAC IS IN EFFECT, AN ATTENDANT CAN, AT THE ATTENDANT'S DISCRETION, GIVE A CALLER ACCESS TO THE CONTROLLED TRUNK GROUP BY NON-DELAYED OR DELAYED OPERATION. AN ATTENDANT CAN ALSO GIVE A STATION ACCESS BY THROUGH DIALING.

ATTENDANT CONSOLES IN A CUSTOMER GROUP ARE NOT AFFECTED BY TAC. THE INTERCEPT TREATMENT WHEN TAC IS ACTIVE CAN BE SPECIFIED ON A CUSTOMER GROUP BASIS. THE INTERCEPT TREATMENTS CAN BE:

1. ROUTE TO THE ATTENDANT

2. ROUTE TO REORDER TONE

3. ROUTE TO ANNOUNCEMENT

ON A PER CUSTOMER GROUP BASIS, SEPARATE TREATMENTS CAN BE SPECIFIED FOR IBN LINES AND INCOMING TRUNK GROUPS.

IF INTERCEPT TO THE ATTENDANT IS REQUIRED, AN ICI CAN BE ASSIGNED TO TAC INTERCEPT.

TRUNK GROUP BUSY (TGB) AND TAC CONTROL WILL BE DISPLAYED ON EVERY CONSOLE IN THE CUSTOMER GROUP WHICH HAS A FEATURE LAMP ASSIGNED TO THE PARTICULAR TRUNK GROUP. ONLY 1 CONSOLE IN THE CUSTOMER GROUP CAN ACTIVATE CONTROL OF A PARTICULAR TRUNK GROUP. THEREFORE, IF THE KEY ASSOCIATED WITH THE FEATURE LAMP IS DEPRESSED BY ANY CONSOLE OTHER THAN THE CONTROL CONSOLE, THIS KEY DEPRESSION IS IGNORED.

IN MULTI CONSOLE OPERATION, SEVERAL CONSOLES CAN BE CONTROLLERS OF TAC, EACH OVER A SEPARATE TRUNK GROUP. TO BE DESIGNATED A CONTROLLER, THE CONSOLE MUST HAVE A FEATURE KEY AND LAMP ASSOCIATED WITH A PARTICULAR TRUNK GROUP.

WHETHER CONTROL IS ACTIVE/NOT ACTIVE, THE LAMP STATE WILL BE THE SAME FOR EVERY CONSOLE ON WHICH THE TRUNK GROUP HAS A LAMP APPEARANCE. THIS REQUIRES TRUNK GROUP CHECKS AS A TRUNK IS SELECTED AND MADE IDLE.

IF SENDERIZED OPERATION APPLIES, THE APPROPRIATE INTERCEPT TREATMENT, IF APPLICABLE, WILL ONLY BE GIVEN AFTER THE STATION HAS DIALED THE WHOLE CALLED NUMBER, NOT JUST THE ACCESS CODE. FOR EXAMPLE, STATION DIALS 28, DMS-100 RETURNS SECOND DIAL TONE, STATION DIALS CALLED NUMBER, DMS-100 GIVES TREATMENT. THE SAME APPLIES TO INCOMING TRUNKS.

IF OVERLAP OUTPUTTING APPLIES, DMS-100 WILL GIVE INTERCEPT TREATMENT AT THE SAME TIME SUFFICIENT DIGITS HAVE BEEN DIALED TO OBTAIN A ROUTE RESULT AND IT IS DETERMINED THAT TAC APPLIES.

IF TAC HAS BEEN APPLIED TO A TRUNK GROUP AND THERE IS AN ALTERNATE ROUTE, DMS-100 WILL ATTEMPT TO COMPLETE THE CALL VIA THE ALTERNATE ROUTE E.G. THE TRUNK GROUP AFFECTED BY TAC WILL BE "SKIPPED OVER".

IF CUT THROUGH DIALING APPLIES, THE STATION WILL RECEIVE THE APPROPRIATE TREATMENT FOLLOWING DIALING OF THE ACCESS CODE. FOR INCOMING TRUNK GROUPS FROM PBX, ONE OR MORE DIGITS MAY HAVE TO BE REGENERATED BEFORE ROUTING AND CONTROL CAN BE DETERMINED. WHEN THE FEATURE KEY IS DEPRESSED BY THE CONTROLLING CONSOLE, ANY IDLE TRUNKS IN THE GROUP WILL BE AVAILABLE TO THE ATTENDANT(S) ONLY AND CALLERS WHOSE LRC/LSC MATCH THE TRUNK GROUP'S ALRC/ALSC. A DELOAD REQUEST WILL ALSO BE MADE FOR ANY TRUNKS WHICH ARE CALL PROCESSING BUSY. AS CALLS ON THESE TRUNKS TERMINATE, THESE TRUNKS WILL ALSO ONLY BE AVAILABLE TO THE ABOVE

NAMED USERS. NOTE: A TESTER CAN POST, TEST, ETC. ANY TRUNK TO WHICH TAC IS APPLICABLE. TRUNK MAINTENANCE IS NOT AFFECTED BY TAC.

FEATURE INTERACTION _____

ON-HOOK QUEUING WITH RINGBACK IS PERMITTED WHEN A TRUNK GROUP IS BUSY AND TAC IS NOT ACTIVE. IT IS NOT PERMITTED WHEN TAC IS ACTIVE. THIS ASSUMES THAT THE ROUTE IST IS COMPOSED OF ONE TRUNK GROUP.

WHEN A HEADSET IS INSERTED AT A CONSOLE, THE LAMP(S) ON THAT CONSOLE WILL REFLECT THE CURRENT STATUS OF THE APPROPRIATE TRUNK GROUP(S) WITH AN APPEARANCE ON THAT CONSOLE.

IF CONTROLS ARE ACTIVE DURING NIGHT SERVICE, BLOCKED CALLERS WILL RECEIVE REORDER TONE IF TAC INTERCEPT IS TO THE ATTENDANT DURING DAYTIME SERVICE.

ANY CONTROLS IN EFFECT WHEN NIGHT SERVICE IS ACTIVATED REMAIN IN EFFECT.

TAC CAN BE ACTIVATED ONCE NIGHT SERVICE IS IN EFFECT PROVIDED A HEADSET IS JACKED-IN TO THE CONTROLLING CONSOLE.

DESIGN APPROACH:

IMPLEMENTATION - (DESCRIBE FUNCTIONAL SPLIT INTO H/W, F/W, PS/W, CC S/W)

CC S/W MODULE EVOLUTION STRATEGY - (DESCRIBED DEVELOPMENT OF HOOKS)

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT LOCKED LOOP OPERATION
Feature no	F0369

DESCRIPTION

A SPECIAL KEY IS REQUIRED ON THE ATTENDANT CONSOLE; WHEN ACTIVATED, THE ATTENDANT AT A SWITCHED LOOP CONSOLE IS ABLE TO RETAIN SUPERVISION OR RECALL CAPABILITY ON ANY PARTICULAR CALL WHICH SHE HAS PROCESSED. WHEN THE KEY IS DEACTIVATED, THE SWITCHED LOOP CIRCUIT IS "LOCKED", IT IS NOT AVAILABLE FOR THE PROCESSING OF OTHER CALLS. THIS FEATURE IS TO DENY THE ATTENDANT ACCESS TO THE HELD LOOP UNLESS RECALLED BY THE STATION USER.

[THIS FEATURE IS USED FOR TRUNK-TO-TRUNK CONNECTIONS AND SERIAL CALLS]

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT SPEED CALLING
Feature no	F0370

DESCRIPTION

This feature permits an attendant to dial frequently called numbers by depressing a Speed Call key and dialing a 1 or 2 digit code.

Speed Calling Programming

To add a number to the Speed Calling list, the attendant will:

1. Depress the Speed Calling key. This will cause the RLS lamp to turn OFF (if it had been ON) and the Speed Calling lamp to flash at 120 IPM. the attendant will hear special Dial Tone.
2. Enter the single digit or two digit number to be assigned to the number to be stored. A single digit applies to short lists; a two digit number applies to long lists.
3. Enter the number to be stored.
4. Depress the Speed Calling key again. This will cause the Speed Calling lamp to turn OFF. The attendant will hear confirmation tone via the headset/handset.

To add another number to the list, the attendant will repeat the above process.

Changes to the Speed Calling List are achieved by overwriting an existing number.

The following illustrates valid programming sequences. Any other keying sequences are invalid and will not affect the speed calling list.

Feature Definition

CT INC.

This feature includes the ability to hold incoming EPSCS, DID and tie trunk calls by flashing, then dialing another station. The other station must be internal to the customer group.

CT OUT.

This feature includes CT INC plus the ability to hold and transfer outgoing calls. Only 1 of the three parties can be outside the customer group.

CT ALL.

This feature include CT INC, CT OUT plus the ability to hold and transfer intra customer group calls. Trunk to trunk connections will also be permitted, provided that machine supervision is available and both connections are not chargeable.

INTERNAL

NOTE: This definition is included specifically for Kodak. To make this feature more usable, "internal" will include stations served by other PBX as long as the number plan is integrated and answer supervision is received. Integrated will mean no access digits, second dial tone, etc.

Feature Use

The following description applies to CT INC, CT OUT and CT ALL.

A has answered a call from B. A determines that the call should be transferred to another station. A flashes which will put B on hold and A will hear special dial tone. A dials the other station (C). Upon hearing audible ringback tone, A can:

- go on-hook. B will be transferred to C.
- wait for C to answer, A can talk privately to C (Consultation Hold). A can then go on-hook and B will be transferred to C.
- flash and talk to B while both are listening to audible ringing. A second flash will reconnect A and B.

If A misdials, flashing once before the interdigital timeout has elapsed will reconnect A and B. If the interdigital timeout has elapsed (i.e. all digits are presumed to be present), A must flash twice to be reconnected to B. If translation connects A to a tone (busy, reorder, etc.) A must wait 30 seconds or flash twice to be reconnected to B. If A is con-

ected to a recorded announcement, A must wait for the announcement to finish or flash twice to be reconnected to B.

After talking privately to C, A can flash which will connect A, B and C in a 3-way call (Add-On). After establishing a 3-way call, A can:

- flash. This will drop C. A regular 2 port call will be established between A and B.
- go on-hook for longer than the flash interval. This will connect B and C as a regular 2 port call.

If A wishes to transfer to the attendant instead of another station, A will dial "0" instead of a station number after receiving special dial tone (Reference V0436).

If a 3 port circuit is not available, the station user will hear reorder tone. Waiting 5 seconds or flashing once will reconnect A and B.

Feature Restrictions

The call transfer field will define the type of transfer that can be initiated. If a station attempts a transfer type that is not permitted, all connections will either be dropped or the switchhook flash will be ignored. Both cases are described below. The transferring station need not be assigned the 3-way calling feature to enable Consultation Hold and Add-On. These two features are basic to the Call Transfer feature.

The following assume that A does not have 3WC (3 Way Calling):

- If station A has answered an intragroup call, CT INC is assigned to the customer group and A flashes, the flash will be ignored.
- If station A has called B (B is outside the customer group) CT INC is assigned to the customer group and A flashes, the flash is ignored.
- If station A has called B (B is outside the customer group) CT OUT is assigned to the customer group and A flashes, A will receive special dial tone. B will be put on hold. If A dials another number outside the customer group, A will hear reorder tone. Waiting 30 seconds or A flashing twice will reconnect A and B. CT OUT will only permit 1 of the 3 parties to be outside the customer group.
- If station A has called B (A to B are chargeable) CT ALL is assigned to the customer group and A flashes, A will receive special dial tone. B will be put on hold. If A to C is also chargeable, A will hear reorder tone. Waiting 5 seconds or A flashing once will reconnect A and B. CT ALL will not permit the eventual connection of 2 chargeable points.

A station assigned 3WC will only be able to transfer the 3-way call if the transfer type is defined for the customer group and the established 3-way call conforms with the transfer type. For example, station A has established a 3-way call to B and C. Both B and C are outside the customer group. The customer group has CT OUT. If A goes on-hook, all connections will be dropped.

If station A has Call Waiting, is busy and a call is not waiting, flash by A will put the call on hold and A will hear special dial tone. A can now dial C. This assumes that the call type conforms with the customer defined transfer type or the station is assigned 3WC.

If station A has Call Waiting, is busy and is informed of a waiting call, flash by A will put the existing call on hold and will connect A to the waiting call. The feature interaction for Call Waiting will now apply. Call Transfer and 3WC are temporarily suspended.

If station A has Attendant Camp-On, is busy and is informed of a camped-on call, flash by A will put the existing call on hold and A will be connected to the camped-on call. Call Transfer and 3WC are temporarily suspended.

If the connection to B is through a recording completing trunk or TOPS trunk (e.g. 9+0 call), a flash by A will not recall the operator but will place B on hold. A will hear special dial tone. The joint hold feature will be deactivated. A rering signal by the operator will be ignored.

If B is an Emergency Service Bureau line or trunk, Call Transfer will be disabled. If A attempts to transfer a call to the ESB, A's control of the call will be disabled. The ESB will control the second leg of the call. B will remain held but may go on-hook, and the A to ESB call will remain intact. A will not be able to flash to conference or to go on-hook to transfer the call. When the ESB has released the second leg of the call, A will be reconnected to B if B still remains held.

If B has CLF assigned, Call Transfer will be denied. If A has CLF assigned, Call Transfer will be allowed only if A is the originator of the A to B call. If A flashes and dials C who has CLF, A's control of the Call Transfer will be removed if C flashes. If C does not flash, the call will progress normally. If C has flashed, B can remain as part of the call, or may disconnect, at which time the call will revert to an A to C call with A's control removed.

If B is the attendant, call transfer and 3WC capabilities will be disabled. If the original leg of the call (A to B or B to A) was completed by the attendant, the following restrictions apply:

- if the attendant has released the call, CT is allowed.
- if the attendant held the call, CT is disallowed and flash by either party will recall the attendant. If C is the attendant, the A and B

will be queued for an attendant. Refer to the Call Transfer - Attendant feature (F0772).

Chaining of 3 port circuits will not be allowed. If a non-controlling station (other than A) flashes, the flash will be ignored. If A flashes after having established a 3-way call, C will be disconnected.

Even if the customer group has 1 of the 3 Call Transfer features described here, a flash by a manual station will be routed to the attendant.

Call Transfer to the attendant when Night Service is active will be disabled.

Regardless of the type of call transfer specified for the customer group, if a reversal is detected on a tie trunk after answer the call will be transferred to the attendant. This assumes that Night Service is not active (Reference F0402).

Station restrictions will still apply. If station A is toll restricted, the customer group has CT ALL, and A dials a toll destination, the call will not be allowed.

If the customer group has CT ALL, B is fully restricted and has called A, call transfer by A will not modify B's restrictions. If A dials a destination not accessible to B, A can talk to the destination. When A goes on-hook, B will not be transferred. The connection will be taken down.

Both legs of the call will be SMDR compatible. It is not known at this time what kind of SMDR output is required after transfer. For the time being, we will leave all SMDR recording units attached to the transferred call.

If a station has the 3WC feature then both legs of the call are allowed to be billable. Transfer in this state is not allowed.

Design Approach

Hardware

TWC will use the 1X31 three port conference circuit. It will be up to the operating company to decide how many are needed. TWC will hold on to the conference circuit from the first flash of a switch hook until either termination of all connections, or until a return to a normal two-port call mode.

PP Firmware

Facilities to provide special dial tone are needed. This tone consists of three (3) short bursts of dial tone (100 ms on, 100 ms off) followed by

continuous regular dial tone (350/440 Hz at 69 dBrnC plus/minus 1.5 DB). This tone is provided by the line module using control options to the digit reception primitives.

PP Software

Control of the TWC will be accomplished using 3 new execs defined for TM type peripherals. The LM will require redefining of one exec.

CC Software

The intent is to utilize all of the existing Three Way Calling code and implement IBN Call Transfer by adding gating procedures to do the extra IBN work. These procedures will return a 'do-nothing' type parameter (may just be a simple return) if IBN is not loaded in the switch. If IBN is loaded in the switch, the gating procedure will be IPL'd to the appropriate procedures.

Since the present IBN call processing design is to use existing recall, disconnect, and error processors for trunk-to-line, line-to-trunk, and line-to-line IBN calls, most of the hooks are in place for Call Transfer. Additional hooks will use the gating procedures described above.

Design Description

TWC Overview

TWC is instigated in the recall processor of the current call after a flash message is received and a check is made to see if the flasher has the TWC feature. The normal recall processor gets one TWC extension block and then calls a TWC recall processor. The TWC recall processor locks at the feature state of both ends of the call to call a cross state feature procedure to do the appropriate things. The original flash will call a procedure which will get one more TWC extension block, three perm extension blocks, and multi-link the flasher to another CCB. This procedure will then send a feature origination message to this new CCB to setup the second leg of the call.

The feature origination message is processed by the standard setup processor to start digit reception beginning with special dial tone. The digits are reported to the same setup processor which will invoke the appropriate translator.

After a route has been selected, a cross processor is called from the setup processor which gets the extra paths required for the TWC and has the capability of handling messages which may originate from the other leg of the call. When the cross processor returns to a condensed state, the feature recall and disconnect routines will handle further developments.

When it has been determined that the call can digress to a normal two port call, the TWC resources will be deallocated, and the normal cross threaded environment will be recreated. Further feature action may occur on the same call and will be treated as a brand new feature.

Call Transfer Implementation

Call Transfer will be implemented as follows:

1. A gating procedure will be called by the recall processors to do the additional IBN restriction checking. This procedure will check the current type of call against the Call Transfer type of the flasher to determine if a Call Transfer call may be stated at all. This will be done by checking the `type_of_origination` and `type_of_termination` fields in the IBN refinement of the CCB format area and the customer group and station data areas. It will return a parameter indicating:
 - if this call may progress to the TWC origination phase.
 - any restrictions which must be placed on the second leg of the call.
2. If the call progresses through the TWC origination and dialing phases to the translation phase, further checks must be made to determine if the second leg of the call is compatible with the Call Transfer characteristics of the station. A call transfer compatibility check will be added to the IBN line translator. If an incompatibility is found, the call will be routed to a tone.
3. If the first and second legs are compatible, then we can provide the transfer capability. This will be done by expanding the feature cross state table to include five new types of feature states:
 - CT_HELD
 - CT_RINGING
 - CT_PRIVATE_CONSULT
 - CT_CONFERENCE_RINGING
 - CT_CONFERENCE

Five new cross state procedures will be required. These cross state procedures will do the actual transferring of the call.

4. At the time the actual transfer is made, further checks must be made. Another gating procedure will be called from the feature disconnect processors to see if call transfer is allowed. If transfer is allowed, the feature state will be altered to one of the states mentioned in 3. above to get to the transfer procedure.

5. The transfer will be accomplished by accessing the CCB of the first leg of the call and copying the port perm data of the party being transferred. The CDB will be reset to concur with the new port. The port will be unlinked from the previous call and linked to this call. All extension blocks pertinent to the transferred party will be unlinked from the first CCB and linked to the second. These will include call forwarding blocks, ama blocks, lama block, etc. TWX extension blocks and the perm extension blocks obtained for the feature setup will not be transferred. All messages queued for the first leg of the call will be resent.
6. A feature exit message will be sent to the first leg of the call to deallocate the party who transferred the call and to release all of the call processing resources of that call.
7. New supervision will be established according to the new cross thread. If the new cross thread is nil, transfer will be denied.
8. If the call cannot be completed directly due to network blockage, the call will be maintained through the conference circuit. If this happens, the TWC/CT environment will be maintained so that resources can be recovered when the call goes down.
9. If the second leg of the call is to the attendant, the gating procedure in the IBN translator will send a flash message to the original CCB indicating that the NCT transfer feature should be invoked. See feature F0772.

CC Software Module Structure

New Modules

IBNCTUTL - this module will provide the gating requirements for optionality. This resident module will belong to the LNUTLSUB subsystem.

CTUTLOI - this module will provide the feature cross states procedures required to transfer a call when a party has exited and therefore, transferred his call. This optional module will reside in an optional subsystem called CTOPTSUB. There will be two sections in this module:

- CTUTLU1 - This section will contain all of the gating procedures and other procedures useful to call transfer code.

- CTEXTIT - This section will contain the five feature cross state procedures required to accomplish call transfer.

CTIPL - This module will initialize the Call Transfer code. It will not exist permanently on the switch. It will be part of the subsystem CTOPTSUB.

Existing Modules

RLLPRCI, RLTPRCI, RTLPRCI - Add a call to the gating procedure to check for CT origination restrictions.

DFLPRCI, DFTPRCI, DTFPRCI - Add a call to gating procedure for final transfer check.

IBNXLA - Add a call to procedure for second leg restrictions. Also, if call is to attendant, send flash message to other call process and release this call resource.

TWCDEFS, TWCTABUI, TWCUTLUI, TWCUTLCI - Add new feature states and include IBN threads in TWC procedures.

Operational Measurements

At present, only one OM is required, that being a count of the number of successful transfers.

Memory Requirements

DATA STORE - There is no additional data store required above what is required for TWC.

PROGRAM STORE - The estimate for program store for the Call Transfer feature is 3.5 kbytes.

Logs

A log report (line 120) is generated if a call transfer is denied due to lack of system resources. Should this report be generated refer to the Northern Telecom Practices 297-1001-510 under line 120 to determine what action is to be taken.

Three Way Calling Datafill

These equations are to be used to ensure that the following office parameters have the correct values for TWC in the table OFCPARMS:

NUMPERMEXT	int	(3c)
NUMLTIBLKS	int	(4c)
NUMTEMPBLKS	int	(c/4)
TOPS_THRESHOLD	conf_mem_number	(b)
NO_OF_TWC_EXT_BLKs	int	(2c)

a) Let a = number of 3 port conference circuits in office (should also be number of entries in conf3pr table) (2 times the number of 1X31 cards).

b) Let b = the number of tops operators on switch (The number of conference circuits in office must be equal to or greater than the number of tops operators).

c) Number of (1X31) 3 port conference circuits for TWX feature:

= a - b
= c
= maximum number of simultaneous TWC in this office.

d) Cold start is needed after changing the OFCPARMS table.

How to know if enough conference circuits, extension blocks, and tone cards are allocated?

- a) For conference circuits use OMSHOW CF3P ACTIVE.
- b) For extension blocks use OMSHOW EXT ACTIVE.
- c) For confirmation tone or silent tone use OMSHOW TONES ACTIVE.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	AUTOMATIC RECALL
Feature no	F0371

DESCRIPTION

AUTOMATIC RECALL WILL APPLY TO CALLS EXTENDED BY ATTENDANTS TO STATIONS DIRECTLY SERVED BY DMS. IT WILL APPLY TO:

- LINE TO LINE CALLS - TRUNK TO LINE CALLS - LINE TO TRUNK AND TRUNK TO TRUNK CALLS IF ANSWER SUPERVISION IS EXPECTED ON THE OUTGOING TRUNK AND THE INTRA GROUP FLAG IS SET FOR THE ROUTE.

IT WILL APPLY TO CALLS WHICH ARE HELD ON LOOP AND CALLS WHICH THE ATTENDANT RELEASES FROM THE CONSOLE AFTER HAVING KEYED THE STATION NUMBER OR DESTINATION NUMBER.

TWO AUTOMATIC RECALL TIMERS WILL BE PROVIDED; ONE FOR DON'T ANSWER RECALLS AND CALL WAITING RECALLS, AND ANOTHER FOR CAMPED-ON RECALLS. BOTH RECALL INTERVALS WILL BE MODIFIABLE, SEPARATELY, FROM 12 TO 60 SECONDS IN 1 SECOND INCREMENTS. 12 SECONDS IS THE LOWER LIMIT SINCE THIS PERMITS 2 RINGING CYCLES (2 SECONDS ON, 4 OFF) FOR IDLE STATIONS AND CALLS WHICH ARE EXTENDED TO BUSY STATIONS VIA THE CALL WAITING FEATURE.

WHEN THE RECALL TIMER EXPIRES, THE UNANSWERED CALL IS QUEUED FOR AN ATTENDANT CONSOLE IF THE CALL WAS PREVIOUSLY RELEASED FROM THE CONSOLE. WHILE QUEUED, THE CALLER HEARS AUDIBLE RINGBACK TONE. PRIOR TO RECALL, CALL WAITING CALLERS AND CALLS EXTENDED TO STATIONS HEAR AUDIBLE RINGBACK TONE WHILE CAMPED-ON CALLERS HEAR SILENCE.

WHEN A RECALL IS PRESENTED ON A CONSOLE LOOP, THE SOURCE LAMP ASSOCIATED WITH THE LOOP WILL FLASH AND THE APPROPRIATE INCOMING CALL IDENTIFICATION (ICI) LAMP WILL TURN ON.

IF THE RECALL WAS PREVIOUSLY EXTENDED VIA EITHER MANUAL OR AUTOMATIC HOLD, THE SOURCE AND DESTINATION LAMPS FOR THE HELD CALL WILL FLASH, BUT AN ICI LAMP WILL NOT TURN ON. HELD LOOP RECALLS DO NOT QUEUE FOR IDLE ATTENDANT CONSOLES; THESE ARE PRESENTED ON THE SAME CONSOLE AND LOOP ON WHICH THEY WERE ORIGINALLY HELD.

AFTER ANSWERING THE RECALL, THE ATTENDANT CAN AUTOMATICALLY RE-EXTEND THE CALL TO THE SAME STATION BY DEPRESSING THE RELEASE KEY, THE HOLD/RELEASE KEY OR ANOTHER LOOP KEY. DEPRESSING HOLD/RELEASE OR ANOTHER LOOP KEY ALSO HOLDS THE CALL ON LOOP.

IF THE CALLER WISHES TO WAIT, THERE IS NO LIMIT ON THE NUMBER OF TIMES A CALL CAN BE AUTOMATICALLY RE-EXTENDED TO A STATION. EACH TIME A CALL IS RE-EXTENDED AND CALL WAITED, THE CALLED STATION WILL HEAR CALL WAITING TONE. CAMP-ON TONE WILL BE HEARD EACH TIME IF THE CAMP-ON TONE CUSTOMER GROUP FLAG IS SET. IF THE CALLED STATION IS IDLE, IT WILL CONTINUE TO BE RUNG.

I. LINE TO LINE AND TRUNK TO LINE CALLS

THE TERMINATING STATION STATE MUST NOT BE PERMITTED TO CHANGE DURING THE AUTOMATIC ATTENDANT RECALL INTERVAL (WHILE THE CALLER IS QUEUED FOR AN ATTENDANT AND WHILE TALKING TO THE ATTENDANT) SO THAT THE ATTENDANT CAN AUTOMATICALLY EXTEND THE CALL. THEREFORE, DURING THE RECALL INTERVAL THE FOLLOWING WILL APPLY:

- IF THE TERMINATING STATION IS IDLE, IT WILL CONTINUE TO BE RUNG.
- IF THE CALLER HAD PREVIOUSLY BEEN CAMPED ON OR CALL WAITED ON A BUSY STATION, A NEW CALL CANNOT BE CAMPED ON OR CALL WAITED DURING THE RECALL INTERVAL.
- IF THE TERMINATING STATION ANSWERS (OFF-HOOK IF RINGING OR FLASHING FOR A CAMPED ON OR CALL WAITING CALL) WHILE THE RECALL IS QUEUED, THE CALL WILL BE DEQUEUED AND THE PARTIES WILL BE CONNECTED.
- IF ANSWER OCCURS WHILE CONNECTED TO THE ATTENDANT LOOP, THE ATTENDANT, CALLING AND CALLED PARTIES WILL BE INVOLVED IN A 3 WAY CALL.
- IF A STATION IS BEING RUNG WHEN THE ATTENDANT ANSWERS THE RECALL, THE ATTENDANT WILL BE SPLIT OFF FROM AUDIBLE RING BACK TONE DURING THE RECALL.
- IF THE CALL IS A HELD LOOP RECALL, AND THE CALLED PARTY ANSWERS (OFF-HOOK OR SWITCH HOOK FLASH) BEFORE THE ATTENDANT DEPRESSES THE LOOP KEY, THE LAMP STATES WILL CHANGE FROM THE RECALL STATE TO AN ACTIVE CALL. IF THE LOCKOUT OPTION IS SET, THE ATTENDANT WILL NOT BE ABLE TO ENTER THE CONNECTION ON THE LOOP.

DURING THE RECALL INTERVAL, BUT BEFORE ATTENDANT ANSWER:

- IF THE CALLING PARTY GOES ON-HOOK, THE CALL WILL BE DEQUEUED. IF THE TERMINATING STATION WAS BEING RUNG, RINGING WILL CEASE. IF THE CALLING PARTY HAD BEEN CAMPED-ON OR CALL WAITED, THIS NO LONGER APPLIES. THE TERMINATING STATION CAN NOW HAVE A NEW CALL CAMPED-ON OR CALL WAITED.
- IF THE RECALL IS HELD ON LOOP, THE SOURCE IS AN IBN CUSTOMER

GROUP STATION AND GOES ON-HOOK, JOINT HOLD WILL APPLY. THE SOURCE LAMP WILL CHANGE FROM 120 IPM TO 60 IPM AND THE DEST WILL TURN OFF. IF THE CALLED STATION WAS BEING RUNG, RINGING WILL STOP. IF THE SOURCE HAD BEEN CAMPED ON OR CALL WAITED, THIS NO LONGER APPLIES.

- IF THE RECALL IS HELD ON LOOP, THE SOURCE IS NOT AN IBN STATION AND GOES ON-HOOK, THE SOURCE LAMP WILL CHANGE FROM 120 IPM TO OFF AND THE DEST WILL TURN OFF. THE REMAINDER FOR THE DEST IS THE SAME AS ABOVE.

DURING THE RECALL INTERVAL, BUT AFTER ATTENDANT ANSWER:

- IF THE SOURCE IS AN IBN CUSTOMER GROUP STATION AND GOES ON-HOOK JOINT HOLD APPLIES. HOWEVER, THE DEST LAMP WILL TURN OFF. DESTINATION RINGING, CAMP-ON OR CALL WAITING WILL NO LONGER APPLY.
- IF THE SOURCE IS NOT AN IBN CUSTOMER GROUP STATION AND GOES ON-HOOK, THE SRC LAMP WILL REMAIN ON (LEAVE ATTENDANT IN ORIGINATING STATE) BUT THE DEST WILL TURN OFF. REFERENCE V0438 "ATTENDANT HOLD" FOR DETAILED LAMP STATES AND FEATURE INTERACTION.

AFTER THE ATTENDANT HAS ANSWERED THE RECALL AND DEPRESSES THE RELEASE DESTINATION KEY:

- IF THE CALLED STATION HAD BEEN RINGING, RINGING WILL STOP
- IF THE SOURCE HAD BEEN CAMPED-ON OR CALL WAITED, THIS NO LONGER APPLIES.

FOR BOTH THE ABOVE, THE DEST LAMP WILL TURN OFF. THE ATTENDANT CAN KEY A NEW DESTINATION OR RELEASE THE CALL.

II. LINE TO TRUNK AND TRUNK TO TRUNK CALLS

THE AUTOMATIC ATTENDANT RECALL FEATURE WILL INCLUDE THESE CALLS IF, AND ONLY IF:

- ANSWER SUPERVISOR IS EXPECTED ON THE OUTGOING TRUNK
- THE INTRA GROUP FLAG IS SET FOR THE ROUTE

IBN TRUNK DATA (IBNKTYP) HAS BEEN MODIFIED TO INCLUDE A FIELD CALLED SUPVTYPE. THIS FIELD WILL BE USED TO DETERMINE WHETHER:

- NO DISCONNECT IS RECEIVED
- DISCONNECT BUT NOT ANSWER IS RECEIVED

- ANSWER AND DISCONNECT ARE RECEIVED (ELIGIBLE FOR AUTOMATIC RECALL FEATURE).

THERE WILL BE A NEW FLAG AGAINST ROUTES AND WILL BE CALLED THE INTRA GROUP FLAG. IT WILL BE USED IN CASES WHERE A CUSTOMER (E.G. KODAK) HAS STATIONS SERVED FROM A NUMBER OF DIFFERENT SWITCHING MACHINES AND THE ATTENDANTS ARE CENTRALIZED ON ONE DMS-100. THIS FLAG WILL PERMIT CUSTOMERS TO EXPAND THE TERM INTRA GROUP TO INCLUDE STATIONS SERVED BY OTHER SWITCHES.

THE AUTOMATIC ATTENDANT RECALL FEATURE IS ONE OF A NUMBER OF FEATURES WHICH WILL USE THE INTRA GROUP ROUTE FLAG.

DOD CALLS ARE BY DEFINITION INELIGIBLE FOR AUTOMATIC ATTENDANT RECALL.

ONCE THE ATTENDANT EXTENDS A CALL TO A STATION SERVED BY ANOTHER SWITCH VIA EITHER RELEASE OR HOLD BUT BEFORE ANSWER SUPERVISION HAS BEEN RECEIVED FROM THE DISTANT END, THE AUTOMATIC ATTENDANT RECALL FEATURE WILL APPLY.

ON OUTGOING TRUNKS, ONLY THE RECALL TIMER WHICH HANDLES BOTH DON'T ANSWER AND CALL WAITING RECALLS WILL APPLY. WHEN THE TIMER EXPIRES (SAME TIMER AS USED FOR LINES) THE UNANSWERED CALL IS QUEUED FOR ATTENDANT ANSWER, OR, IF THE CALL WAS PREVIOUSLY HELD ON LOOP, THE RECALL IS PRESENTED ON THE SAME CONSOLE AND LOOP ON WHICH IT WAS PREVIOUSLY HELD.

THE FOLLOWING APPLY TO AUTOMATIC RECALL INVOLVING OUTGOING TRUNKS:

- THE ICI CATEGORY, IF ASSIGNED, WILL BE RECALL - NO ANSWER -
- THE OUTGOING TRUNK CONNECTION IS MAINTAINED DURING THE RECALL (SEE ALSO THE FOLLOWING). WHEN THE ATTENDANT ANSWERS THE RECALL, THE ATTENDANT WILL SPLIT OFF FROM DESTINATION RINGING. THIS ASSUMES THE ATTENDANT EXTENDED THE CALL TO AN IDLE DESTINATION.
- IF ANSWER SUPERVISION IS RECEIVED WHILE THE RECALL IS QUEUED, THE RECALL WILL BE DEQUEUED AND A TWO PORT CALL (LINE TO TRUNK OR TRUNK TO TRUNK WILL RESULT). IF THE CALL IS HELD ON LOOP AND THE ATTENDANT HAS NOT YET RESPONDED TO THE HELD LOOP RECALL, THE SRC AND DEST LAMPS WILL WINK AT 20 IPM. IF THE LOCKOUT OPTION IS SET, THE ATTENDANT WILL NOT BE ABLE TO ENTER THE LOOP (SAME AS STATION TERMINATIONS).
- IF ANSWER SUPERVISION IS RECEIVED AFTER THE ATTENDANT HAS ANSWERED THE RECALL, THE ATTENDANT, SOURCE AND DESTINATION WILL BE INVOLVED IN A 3 WAY CALL.
- IF THE SOURCE GOES ON-HOOK DURING THE RECALL, EITHER BEFORE OR AFTER THE ATTENDANT ANSWERS, DMS WILL RELEASE THE OUTGOING TRUNK. IF THE SOURCE IS AN INCOMING TRUNK, THE SOURCE IS

RELEASED. IF THE SOURCE IS AN IBN STATION AND THE CALL IS HELD ON LOOP, JOINT HOLD APPLIES.

THE ATTENDANT MAY INADVERTANTLY EXTEND A CALL TO BUSY TONE, REORDER TONE OR DEAD AIR IN A DISTANT SWITCH. DMS WILL NOT PREVENT THIS WITHOUT COMMON CHANNEL SIGNALLING. IF EXTENDED, VIA EITHER HOLD OR RELEASE, THE CALL WILL BE SUBJECT TO AUTOMATIC ATTENDANT RECALL.

DMS DOES NOT STORE THE FEATURES ASSOCIATED WITH DISTANT STATIONS (ATTENDANTS AND STATIONS SERVED BY DIFFRENT SWITCHES).

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	CALL HOLD
Feature no	F0374

DESCRIPTION

THE HOLD FEATURE PERMITS AN ATTENDANT TO HOLD A CALL ON LOOP. HOLD CAN BE ACTIVATED IN 2 WAYS:

- MANUALLY, BY DEPRESSING THE HOLD/RELEASE KEY (THIS KEY HAS A DUAL FUNCTION). THIS KEY IS DESIGNATED HOLD ON THE CONSOLE MAT. FOR FEATURE DEFINITION PURPOSES, IT IS CALLED HOLD/RELEASE TO EMPHASIZE IT'S DUAL FUNCTION.
- AUTOMATICALLY, BY DEPRESSING ANOTHER LOOP KEY

BOTH MANUAL AND AUTOMATIC HOLD ARE BASIC ATTENDANT CONSOLE FEATURES. NEITHER CAN BE ASSIGNED AS OPTIONS.

A MAXIMUM OF 6 CALLS CAN BE SIMULTANEOUSLY HELD ON A CONSOLE (THERE ARE 6 LOOPS PER CONSOLE, HOWEVER, A MINIMUM OF 2 CAN BE SPECIFIED AS BEING FUNCTIONAL).

WHEN EITHER FORM OF HOLD IS ACTIVATED, THE CALL DOES NOT PHYSICALLY REMAIN CONNECTED TO THE LOOP BUT THE LOOP IS NOT AVAILABLE FOR NEW CALL ARRIVALS. HOLD PERMITS THE ATTENDANT TO ENTER A CONNECTION PREVIOUSLY HELD ON ONE OF THE LOOPS (REFERENCE KODAK FEATURE 19.15 "BREAK-IN") OR FOR A STATION TO RECALL THE ATTENDANT.

FEATURE ACTIVATION _____

A. MANUALLY, VIA HOLD/RLS KEY

CALLS ARE HELD ON LOOP IF THE ATTENDANT DEPRESSES THE HOLD/RLS KEY. AFTER OPERATION OF THE HOLD/RLS KEY, THE CONSOLE BECOMES IDLE AND THE ATTENDANT CAN RECEIVE OR ORIGINATE ANOTHER CALL ON ANOTHER LOOP. THE RLS LAMP TURNS ON IF THERE ARE NO CALLS WAITING IN A QUEUE. IF CALLS ARE WAITING, THE ATTENDANT WILL BE ALERTED TO THIS FACT AS DESCRIBED IN F0383 "UNIFORM CALL DISTRIBUTION".

THE ICI LAMP FOR THE HELD CALL TURNS OFF UNLESS OTHER CALLS OF THE SAME TYPE AS THE HELD CALL ARE WAITING IN QUEUE AND THE CONSOLE IS IMMEDIATELY ELIGIBLE TO RECEIVE A NEW CALL - REFERENCE V0433.

B. AUTOMATIC HOLD

CALLS ARE AUTOMATICALLY HELD ON LOOP IF THE ATTENDANT DEPRESSES ANOTHER LOOP KEY. OPERATION OF ANOTHER LOOP KEY CAUSES THE CONSOLE TO REMAIN BUSY. THEREFORE, THE ATTENDANT CAN ORIGINATE ANOTHER CALL BUT WILL NOT BE ALERTED TO A NEW CALL WAITING IN THE QUEUE.

HELD LOOP RECALLS ARE NOT AFFECTED SINCE THESE CALLS ARE PRESENTED ON THE SAME CONSOLE AND LOOP ON WHICH THEY WERE HELD.

THE LAMP STATES ASSOCIATED WITH THE HELD CALL, ONCE HOLD/RLS IS OPERATED, OR AUTOMATIC HOLD IS INVOKED, ARE:

1. INCOMING CALL HAS BEEN ANSWERED, NO DESTINATION INVOLVED:

- SRC WINKS AT 20 IPM
- DEST IS OFF

2. INCOMING CALL HAS BEEN ANSWERED, DESTINATION IS RINGING:

- SRC WINKS AT 20 IPM
- DEST FLASHES AT 60 IPM

IF THE DESTINATION SUBSEQUENTLY ANSWERS, THE LAMP STATES WILL BE:

- SRC WINKS AT 20 IPM
- DEST WINKS AT 20 IPM

3. INCOMING CALL HAS BEEN ANSWERED, DESTINATION IS BUSY. CAMP-ON OR CALL WAITING (REFERENCE V0446 AND V0456 FOR ATTENDANT CAMP-ON AND CALL WAITING FEATURES) IS ALLOWED. IF SECRECY IS NOT SET BOTH THE SRC AND ATTENDANT HEAR 2 SECONDS OF BUSY TONE. THE LAMP STATES WILL BE:

- SRC WINKS AT 20 IPM
- DEST WINKS AT 120 IPM

4. IF THE DESTINATION SUBSEQUENTLY BECOMES IDLE, THE CAMPED-ON/CALL WAITED CALL WILL BE PRESENTED TO IT AND THE LAMP STATES, BEFORE THE DEST ANSWERS, WILL BE:

- SRC WINKS AT 20 IPM
- DEST FLASHES AT 60 IPM

5. IF THE DESTINATION RESPONDS TO THE CAMPED-ON/CALL WAITED CALL BY SWITCH HOOK FLASHING, THE LAMP STATES WILL CHANGE FROM 3 ABOVE TO:

- SRC WINKS AT 20 IPM
- DEST WINKS AT 20 IPM

6. INCOMING CALL HAS BEEN ANSWERED, DESTINATION IS BUSY.

CAMP-ON/CALL WAITING IS NOT ALLOWED. THE ATTENDANT IMME-

DIATELY (DURING 2 SECONDS OF REORDER TONE) OPERATES THE HOLD/RLS KEY:

- SRC WINKS AT 20 IPM
- DEST IS OFF

THE SRC IS HELD WITHOUT A DESTINATION AND THE CONSOLE IS PLACED AT THE BOTTOM OF THE IDLE ATTENDANT CONSOLE QUEUE.

7. INCOMING CALL HAS BEEN ANSWERED, DESTINATION IS BUSY. CAMP-ON/CALL WAITING IS NOT ALLOWED. DURING THE 2 SECONDS OF REORDER TONE (HEARD BY ATTENDANT ONLY IF SECRECY IS IN EFFECT OR HEARD BY BOTH THE SRC AND ATTENDANT IF SECRECY IS NOT IN EFFECT), THE LAMP STATES WILL BE:

- SRC LAMP IS ON
- DEST IS ON

AFTER 2 SECONDS OF REORDER TONE, THE LAMP STATES WILL BE:

- SRC LAMP IS ON
- DEST IS OFF

THE ATTENDANT CAN NOT OPERATE THE HOLD/RLS KEY. IF OPERATED, THE LAMP STATES WILL BE:

- SRC WINKS AT 20 IPM
- DEST IS OFF

8. IF THE DESTINATION IS AN OUTGOING TRUNK, THE TRUNK TYPE IS NT5X25, ANSWER SUPERVISION WILL NEVER BE RECEIVED. THEREFORE, AFTER THE ATTENDANT DEPRESSES THE HOLD/RLS KEY, THE LAMP STATES WILL BE:

- SRC WINKS AT 20 IPM
- DEST WINKS AT 20 IPM

9. ITEMS 3 THROUGH 7 ONLY APPLY IF THE DESTINATION AND THE ATTENDANT ARE DIRECTLY SERVED (LINE TERMINATION) BY THE SAME DMS-100. THEREFORE, IF THE ATTENDANT EXTENDS A CALL VI HOLD/RLS TO EITHER AN IDLE OR BUSY DESTINATION VIA OTHER THAN AN NT5X25 TRUNK, THE LAMP STATES, PRIOR TO DESTINATION ANSWER WILL BE:

- SRC WINKS AT 20 IPM
- DEST FLAHSSES AT 60 IPM

WHEN ANSWER SUPERVISION S RECEIVED FROM THE DISTANT SWITCH (ASSUMING THE DEST ANSWERS), THE LAMP STATES WILL CHANGE FROM THE ABOVE TO:

- SRC WINKS AT 20 IPM
- DEST WINKS AT 20 IPM

DMS-100 DOES NOT STORE THE FEATURES WHICH MAY OR MAY NOT BE AVAILABLE ON DISTANT SWITCHES. DMS DOES NOT DETECT RINGBACK TONE, BUSY TONE, REORDER TONE OR ANNOUNCEMENTS FROM THE DISTANT SWITCH.

10. ITEMS 8 AND 9 ARE DEPENDENT ON TRUNK GROUP DATA FILL WHICH SPECIFIES WHETHER:

- ONLY DISCONNECT SUPERVISION WILL BE RECEIVED
- ANSWER AND DISCONNECT ARE EXPECTED
- DISCONNECT SUPERVISION WILL NOT BE RECEIVED

11. IF THE ATTENDANT OPERATES HOLD/RLS BEFORE THE DESTINATION DIGITS HAVE BEEN COMPLETELY KEYED (PARTIAL DIAL), THE CALLED DIGITS ALREADY DIALED ARE IGNORED. THE LAMP STATES WILL BE:

- SRC WINKS AT 20 IPM
- DEST TURNS OFF

THE SRC IS HELD. THIS IS THE SAME AS HOLDING A SRC WITHOUT A DEST (ITME 1).

12. IF THE ATTENDANT IS THE ORIGINATOR OF THE CALL, THE DESTINATION ANSWERS AND HOLD/RLS IS OPERATED:

- SRC WINKS AT 20 IPM
- DEST IS OFF

THE SRC IS HELD.

PRIOR TO CALLED ANSWER, THE ATTENDANT IS THE SRC WITH ONLY THE SRC LAMP ON. AFTER CALLED ANSWER, THE CALLED PARTY BECOMES THE SRC.

13. IF THE ATTENDANT IS THE ORIGINATOR OF THE CALL AND OPERATES HOLD/RLS BEFORE CALLED ANSWER, THE LAMP STATES WILL BE:

- SRC TURNS OFF
- DEST IS OFF

THE LOOP IS RELEASED.

WHERE ANSWER IS NEVER RECEIVED, SEE ITEM 10 ABOVE, OPERATION OF THE HOLD/RLS KEY WILL BE VALID ONLY AFTER DMS HAS COMPLETED OUTPULSING.

14. IF AN AUTOMATIC ATTENDANT RECALL OCCURS FOR A HELD CALL (REFERENCE F0371) THE LAMP STATES ASSOCIATED WITH THE LOOP ON WHICH THE CALL AS HELD WILL BE, IF DUE TO "DON'T ANSWER":

- SRC WINKS AT 120 IPM
- DEST FLASHES AT 60 IPM

THE CONSOLE MOMENTARILY BUZZES.

THE ABOVE ALSO APPLIES TO CALLS EXTENDED VIA OUTGOING TRUNK WHERE ANSWER IS ALWAYS EXPECTED AND THE ROUTE IS CLASSIFIED AS INTRA GROUP, EVEN THOUGH ON OUTGOING TRUNKS, THE ATTENDANT MAY HAVE ACCIDENTLY EXTENDED THE CALL TO BUSY TONE, ETC.

IF THE RECALL IS BECAUSE THE TERMINATING STATION HAS NOT RESPONDED TO CAMP-ON OR CALL WAITING (ONLY APPLIES WHERE THE ATTENDANTS AND STATIONS ARE SERVED BY THE SAME DMS-100), THE LAMP STATES WILL BE:

- SRC WINKS AT 120 IPM
- DEST WINKS AT 120 IPM

THE CONSOLE MOMENTARILY BUZZES.

15. WHEN THE ATTENDANT DEPRESSES THE APPROPRIATE LOOP KEY FOR AN AUTOMATIC ATTENDANT RECALL HELD ON LOOP, THE LAMP STATE WILL BE:

- SRC TURNS ON
- DEST CONTINUES TO FLASH AT 60 IPM (IF DON'T ANSWER RECALL)
- DEST CONTINUES TO WINK AT 120 IPM (IF LAMP-ON OR CALL WAITING RECALL)

THE ATTENDANT AND SRC WILL BE SPLIT OFF FROM ANY DESTINATION TONES. THE ATTENDANT CAN NOW SPEAK TO THE SRC. THE ATTENDANT CAN EXTEND THE CALL TO THE SAME DESTINATION VIA EITHER HOLD OR RELEASE IF THE CALLER WISHES TO WAIT. THE ATTENDANT DOES NOT HAVE TO REKEY THE DESTINATION DIGITS. REFERENCE F0371.

THE ATTENDANT CAN EXTEND THE SRC TO A NEW DESTINATION BY DEPRESSING RLS DEST AND KEYING A NEW DESTINATION NUMBER. DEPRESSING RLS DEST CAUSES THE DEST LAMP TO TURN OFF. THE DEST LAMP WILL AGAIN TURN ON WHEN THE ATTENDANT KEYS THE FIRST DIGIT OF THE DESTINATION NUMBER.

16. WHILE HELD ON LOOP, A STATION OR STATION ACCESSED VIA A TRUNK CAN RECALL THE ATTENDANT (REFERENCE F0772 "CALL TRANSFER-ATTENDANT" FOR FEATURE DETAILS) BY SWITCH HOOK FLASH.

WHEN THIS OCCURS, THE LAMP STATES WILL BE:

- SRC WINKS AT 120 IPM
- DEST WINKS AT 120 IPM

THE CONSOLE MOMENTARILY BUZZES.

WHEN THE ATTENDANT ANSWERS, BOTH THE SRC AND DEST LAMPS TURN ON. IF THE SECRECY OPTION IS SET, THE EXCL SRC LAMP WILL ALSO TURN ON AND THE ATTENDANT WILL BE CONNECTED WITH THE DEST. (THE PARTY WHO FLASHED IS ON THE DEST SIDE, THE TRANSFERRED PARTY IS ON THE SRC SIDE OF THE LOOP).

- 17 WHERE THE ATTENDANT AND IBN STATION ARE BOTH SERVED BY THE SAME DMS-100 SWITCH AND BOTH BELONG TO THE SAME CUSTOMER GROUP, THE STATION CAN ASK THE ATTENDANT TO PLACE A CALL ON A DELAY BASIS AND BE NOTIFIED WHEN THE DESIRED PARTY HAS BEEN REACHED.

WHEN THE IBN STATION (SRC) GOES ON-HOOK, THE SRC LAMP WILL CHANGE FROM ON TO FLASHING AT 60 IPM. JOINT HOLD WILL APPLY AS LONG AS THE ATTENDANT DOES NOT DEPRESS RLS OR RLS SRC. WHILE HELD, THE STATION CANNOT RECEIVE OR PLACE CALLS.

THE ATTENDANT CAN NOW KEY THE REQUESTED DESTINATION ON THE DEST SIDE OF THE LOOP. WHEN THE DESIRED DESTINATION HAS BEEN REACHED, THE ATTENDANT CAN SIGNAL THE ON-HOOK IBN STATION BY DEPRESSING SIG SRC. THIS WILL CAUSE THE ON-HOOK STATION TO BE RUNG. WHEN THE STATION ANSWERS, THE SRC LAMP WILL CHANGE FROM 60 IPM TO ON. THE ATTENDANT CAN NOW EITHER HOLD THE CALL ON LOOP OR RELEASE THE CALL FROM THE LOOP.

18. IF ONLY A SRC EXISTS ON A HELD CALL, THE SRC IS NOT JOINTLY HELD (E.G. - IBN STATION BUT DIFFERENT CUSTOMER GROUP, POTS LINE OR A DISCONNECT IS RECEIVED ON AN INCOMING OR 2 WAY TRUNK), THE LAMP STATES WILL BE:

- SRC TURNS OFF
- DEST IS OFF

THE LOOP IS RELEASED.

19. IF THE SRC IS AN IBN STATION, THE LAMP STATES WILL BE, WHEN THE SRC GOES ON-HOOK:

- SRC FLASHES AT 60 IPM
- DEST IS OFF

IF THE SRC GOES OFF-HOOK AGAIN, THE SRC WILL AGAIN WINK AT 20 IPM. THE LOOP IS HELD.

20. IF A HELD CALL INVOLVES BOTH A SRC AND DEST, THE SRC GOES ON-HOOK AND THE DEST REMAINS OFF-HOOK, THE LAMP STATES WILL BE:

IF SRC IS NOT AN IBN STATION (SEE 18 ABOVE):

- SRC TURNS OFF
- DEST WINKS AT 20 IPM

IF SRC IS AN IBN STATION:

- SRC FLASHES AT 60 IPM
- DEST WINKS AT 20 IPM

IN BOTH THE ABOVE, THE LOOP IS HELD.

21. IF A HELD CALL INVOLVES BOTH A SRC AND DEST, THE SRC REMAINS OFF-HOOK AND THE DEST GOES ON-HOOK, THE LAMP STATES WILL BE, ONCE CC HAS DEALLOCATED THE SOFTWARE RESOURCES ASSOCIATED WITH THE DEST:

- SRC WINKS AT 20 IPM
- DEST TURNS OFF

THE LOOP IS HELD.

22. IF A HELD CALL INVOLVES BOTH A SRC AND DEST, BOTH GO ON-HOOK AND THE SRC IS AN IBN CUSTOMER GROUP STATION, THE LAMP STATES WILL BE:

- SRC FLASHES AT 60 IPM
- DEST TURNS OFF

THE LOOP IS HELD.

23. THE FOLLOWING APPLIES TO CALLS WHICH WERE HELD PRIOR TO CALLED ANSWER AND WHICH ARE SUBJECT TO AUTOMATIC ATTENDANT RECALL (REFERENCE F0371).

IF THE SRC IS AN IBN CUSTOMER GROUP STATION (SEE 18 ABOVE) AND WAS EXTENDED TO AN IDLE DEST, THE SRC GOES ON-HOOK, THE LAMP STATES WILL BE:

- SRC FLASHES AT 60 IPM
- DEST TURNS OFF

THE LOOP IS HELD.

HOWEVER, DESTINATION RINGING WILL STOP.

IF THE SRC WAS CALL WAITED ON A BUSY DEST AND GOES ON-HOOK, THE LAMP STATES WILL BE:

- SRC FLASHES AT 60 IPM
- DEST TURN OFF

THE LOOP IS HELD.

HOWEVER, THE ON-HOOK SRC WILL NO LONGER BE CALL WAITED ON THE DEST.

IF THE SRC IS NOT AN IBN CUSTOMER GROUP STATION (SEE 18 ABOVE) AND GOES ON-HOOK, THE LAMP STATES WILL BE:

- SRC TURNS OFF
- DEST TURNS OFF

RINGING OF THE STATION WILL STOP. IF THE ON-HOOK SRC HAD BEEN CAMPED ON OR CALL WAITED, THIS WILL NO LONGER APPLY.

THE LOOP IS RELEASED.

24. THE FOLLOWING APPLIES IF THE ATTENDANT HAD EXTENDED OR ORIGINATED A CALL TO A RECALLABLE TOLL OPERATOR AND HELD THE CALL ON LOOP. RECALLABLE MEANS THE ATTENDANT PLACED THE CALL ON A 0-, 0+ OR 01+ BASIS E.G. NOT A CAMA CALL.

IF THE ATTENDANT DEPRESSES SIG SRC OR SIG DEST (DEPENDING ON WHETHER THE ATTENDANT CALLED THE OPERATOR ON THE SRC OR DEST SIDE), AN ON-HOOK WINK WILL BE SENT TO THE TOLL OFFICE IF DMS IS A CLASS 5. IF DMS IS A PBX, AN ON-HOOK WINK WILL BE SENT VIA THE 5X25 TRUNK CARD TO THE CLASS 5. FOR THE PBX CASE, THE TIMING OF THE ON-HOOK WINK MUST NOT BE SHORTER THAN THE SWITCH HOOK FLASH TIMING FOR LINES IN THE CLASS 5 OFFICE. THE ATTENDANT, ONCE THE TOLL OPERATOR HAS ANSWERED, CAN REQUEST TIME AND CHARGES.

THE ATTENDANT CAN ALSO DEPRESS RLS, RLS SRC OR RLS DEST. ASSUMING ONLY ONE PARTY WAS STILL INVOLVED IN THE CALL WHEN ANY OF THESE KEYS WERE DEPRESSED (E.G. IBN SRC IS ON-HOOK, TOLL OPERATOR HAS NOT RELEASED), THE LAMP STATES WILL BE, ONCE RLS IS DEPRESSED:

- SRC TURNS OFF
- DEST TURNS OFF

THE LOOP WILL BE RELEASED.

HOWEVER, DMS WILL SIGNAL ON-HOOK TOWARD THE TOLL OFFICE (IF CLASS 5) OR VIA 5X25 (IF PBX). THE TRUNK WILL NOT BE IDLED UNTIL DISCONNECT IS RECEIVED FROM THE CLASS 5 OR TOLL END. IF THE TOLL OPERATOR RINGS BACK INSTEAD OF DISCONNECTING, THE CALL WILL BE QUEUED FOR THE ATTENDANT AS A NEW CALL.

25. FOR ON-HOOK IBN STATIONS (SEE 18 ABOVE), THE ATTENDANT CAN RELEASE THE STATION BY DEPRESSING RLS SRC OR RLS. THE ATTENDANT CAN ALERT THE STATION BY DEPRESSING SIG SRC. DEPRESSING SIG SRC WILL CAUSE THE ON-HOOK STATION TO BE RUNG.

26. IF THE ATTENDANT HAS 1 OR MORE CALLS HELD ON LOOP AT THE TIME THAT BOTH HEADSETS/HANDSETS ARE UNJACKED (ASSUMING MORE THAN 1 IS JACKED-IN), THE ATTENDANT HAS 1 MINUTE IN WHICH TO INSERT A HEADSET. THIS TYPICALLY OCCURS WHEN ONE ATTENDANT IS RELIEVING ANOTHER AND BOTH PREFER EITHER LEFT SIDED OR RIGHT SIDED HEADSET JACKS (THERE ARE 2 JACKS, 1 ON EACH SIDE OF THE CONSOLE).

IF A HEADSET IS NOT PLUGGED IN WITHIN THE MINUTE, ANY CALLS HELD ON LOOP ARE FORCE RELEASED BY DMS-100, ANY LAMPS WHICH MAY HAVE BEEN ON OR FLASHING WILL TURN OFF. IN SINGLE CONSOLE OPERATION, NIGHT SERVICE IS ACTIVATED.

IN BOTH SINGLE AND MULTIPLE CONSOLE OPERATION, THE CONSOLE BECOMES AVAILABLE FOR MANUAL TESTING VIA THE CONSOLE TEST KEY.

TIMING FOR JACK-IN IS DONE BY BOTH THE CONSOLE AND CC. IF A JACK-IN OCCURS DURING THE 1 MINUTE INTERVAL, ANY HELD CALLS ARE UNDISTURBED.

FEATURE INTERACTION _____

IF THE CALLING STATION GOES ON-HOOK AND THE ATTENDANT DEPRESSES RLS OR RLS SRC, JOINT HOLD WILL NO LONGER APPLY.

IF THE ATTENDANT EXTENDS A CALL VIA RLS, JOINT HOLD DOES NOT APPLY.

IF THE ATTENDANT DEPRESSES SIG SRC AND THE SOURCE IS AN IBN CUSTOMER GROUP STATION, THE ATTENDANT MUST HEAR AUDIBLE RINGBACK TONE. IF SECRECY IS SET AND THE DESTINATION HAS ANSWERED, THE DESTINATION WILL ALSO HEAR AUDIBLE RINGBACK TONE. TO NOT HAVE THE DESTINATION HEAR RINGING, THE ATTENDANT MUST DEPRESS EXCL DEST.

DELAYED OPERATION AND ATTENDANT CONFERENCE ARE INCOMPATIBLE.

THE ATTENDANT CANNOT EXTEND A CALL TO A BUSY STATION OR LINE SERVED BY DMS WHEN THE CALLING STATION IS ON-HOOK (PRIOR TO OR AFTER SIG SRC HAS BEEN DEPRESSED) REGARDLESS OF WHETHER THE CALLED LINE OR STATION HAS CAMP-ON OR CALL WAITING. THE CALLING STATION MUST NOT BE SUBJECTED TO AUDIBLE RINGBACK TONE UPON GOING OFF-HOOK OR AUTOMATIC RECALL. IF THE ATTENDANT ATTEMPTS TO DO THIS VIA RLS, JOIN HOLD IS DISABLED; IF VIA HLD/RLS OR ANOTHER LOOP KEY, THE STATION IS HELD WITHOUT A DESTINATION.

HOLD, WHETHER ACTIVATED MANUALLY VIA HOLD/RLS OR AUTOMATICALLY BY DEPRESSING ANOTHER LOOP KEY IS COMPATIBLE WITH CAMP-ON AND CALL WAITING.

ONCE A CALL IS HELD AND ANSWER SUPERVISION IS RECEIVED, AN ATTENDANT CANNOT RE-ENTER THE HELD LOOP BY DEPRESSING IT IF THE LOCKOUT FEATURE IS SET.

SECURITY IS REMOVED THE MOMENT HOLD IS ACTIVATED. IF EITHER THE SRC OR DEST WAS EXCLUDED VIA THE TWO-WAY SPLITTING FEATURE, EXCLUSION IS CANCELLED ONCE HOLD IS ACTIVATED.

THE SOURCE, IF CAMPED-ON OR HELD WITHOUT A DESTINATION, WILL BE SWITCHED TO MUSIC ON HOLD IF THIS IS AN IBN CUSTOMER GROUP FEATURE.

THIS ONLY APPLIES IF THE SRC IS NOT A STATION BELONGING TO THE CUSTOMER GROUP. MUSIC ON HOLD IS A FUTURE FEATURE. WHILE THE ATTENDANT IS ACTIVE ON THE LOOP AND THE DEST GOES ON-HOOK, THE ATTENDANT CAN SIGNAL THE DEST BY DEPRESSING SIG DEST.

ON TRUNK TO TRUNK CONNECTIONS WHICH DO NOT PROVIDE DISCONNECT SUPERVISION (DETERMINED FROM DATA FILL), OPERATION OF THE RLS KEY WILL BE THE SAME AS HOLD AND THE CALL WILL BE HELD ON LOOP. SUCH CALLS MUST BE MANUALLY RELEASED BY THE ATTENDANT.

BUSY VERIFICATION CALLS CANNOT BE HELD.

INVALID KEYING _____

DEPRESSING RLS WHILE THE SOURCE IS ON-HOOK AND THE DESTINATION HAS NOT ANSWERED IS INVALID. JOINT HOLD WILL NO LONGER APPLY. RINGING OF THE STATION (IF SIG SRC HAD BEEN DEPRESSED) WILL CEASE. ALL CONNECTIONS SET UP WILL BE RELEASED. DESTINATION ANSWER WILL BE DETERMINED BY 1 OR MORE OF THE FOLLOWING:

- ANSWER SUPERVISION - DMS HAS FINISHED OUTPUTTING - THE END OF DIALING TIMER HAS EXPIRED (REQUIRED FOR CUT THROUGH)

DEPRESSING HLD/RLS OR ANOTHER LOOP KEY WHILE THE SOURCE IS ON-HOOK AND HAS NOT BEEN RERUNG (SIG SRC) AND THE DESTINATION HAS NOT ANSWERED IS INVALID (REFERENCE ABOVE FOR DESTINATION ANSWER PARAMETERS). THE SOURCE WILL REMAIN HELD (THE JOINT HOLD FEATURE WILL STILL APPLY), BUT THE DESTINATION WILL BE IDLED.

DEPRESSING HLD/RLS WHILE THE SOURCE IS ON-HOOK AND IS BEING RERUNG (SIG SRC HAS BEEN DEPRESSED) AND THE DESTINATION HAS NOT YET ANSWERED (REFERENCE ABOVE FOR ANSWER PARAMETERS) IS INVALID. THE SOURCE WILL BE HELD AND THE DESTINATION RELEASED. LAMP STATES WILL BE:

- SRC FLASHES AT 60 IPM - PRIOR TO ANSWER - SRC WINKS AT 20 IPM - AFTER ANSWER - DEST TURNS OFF

DEPRESSING HLD/RLS WHILE THE SRC IS ON-HOOK (BEFORE OR AFTER SIG SRC IS DEPRESSED) AND THE DEST HAS ANSWERED - REFERENCE ABOVE FOR ANSWER PARAMETERS - IS A VERY POOR OPERATING PRACTICE BUT WILL BE TOLERATED. THE LAMP STATES WILL BE, ONCE HOLD IS ACTIVATED:

- SRC FLASHES AT 60 IPM - DEST WINKS AT 20 IPM

IF THE SRC ANSWERS OR GOES OFF-HOOK WHILE JOINTLY HELD, THERE IS A DEST AND THE LOCKOUT OPTION IS SET, THE ATTENDANT WILL BE LOCKED OUT OF THE CONNECTIONS.

FEATURE NOTES _____

IN THE PRECEDING, HOLD KEY DEPRESSION IS MENTIONED. THE SAME OPERATION APPLIES IF AUTOMATIC HOLD IS INVOKED.

DISCONNECT TIMING IN THE PRECEDING MAKES USE OF EXISTING OFFICE PARAMETERS.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	INTERPOSITION CALLS AND TRANSFERS
Feature no	F0375

FEATURE SYNOPSIS

This feature enables:

1. an attendant to call and speak to another attendant
2. an attendant to transfer a call to another attendant
3. a subscriber to call a particular attendant console.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	LOCKOUT
Feature no	F0376

DESCRIPTION

IF LOCKOUT IS ENABLED, AN ATTENDANT MAY NOT RE-ENTER A CALL ON A HELD LOOP UNLESS EITHER RECALLED BY A STATION USER OR UPON AUTO- MATIC ATTEND- ANT RECALL.

THIS FEATURE ONLY APPLIES TO CALLS WHICH ARE HELD ON AN ATTENDANT LOOP; THE ATTENDANT IS AUTOMATICALLY DENIED ACCESS TO CALLS WHICH ARE RELEASED FROM THE LOOP EXCEPT VIA BUSY VERIFICATION.

LOCKOUT IS AUTOMATICALLY ACTIVATED WHEN THE LOCKOUT OPTION IS SET. IF SET, LOCKOUT APPLIES TO ALL ATTENDANT CONSOLE. IT CAN- NOT BE SET ON A PER CONSOLE BASIS.

THIS FEATURE DOES NOT APPLY TO CONNECTIONS WHERE MACHINE DISCON- NECT SUPERVISION IS NOT RECEIVED. ONE EXAMPLE OF LACK OF MACHINE DISCONNECT SUPERVISION IS ON CERTAIN TRUNK TO TRUNK CONNECTIONS E.G. THE INCOMING TRUNK IS RINGDOWN WITH LOOP OPTION; THE ATTEND- ANT EXTENDS THE CALL VIA AN OUTGOING LOOP START TRUNK. (FOR KODAK, DMS WILL NOT SUPPORT OUT- GOING LOOP START TRUNKS). IT CAN ALSO OCCUR ON CERTAIN TIE TRUNK CON- NECTIONS.

THIS FEATURE DOES NOT APPLY TO 6 PORT CONFERENCE CALLS HELD ON LOOP (FUTURE FEATURE).

TO RECALL THE ATTENDANT, THE STATION WILL FLASH. THE RECALL IS PRE- SENTED ON THE LOOP ASSOCIATED WITH THE HELD CALL. THE ATTEND- ANT CAN NOW RE-ENTER THE CALL HELD ON LOOP BY DEPRESSING THE LOOP KEY.

IF AN AUTOMATIC ATTENDANT RECALL OCCURS, REFERENCE F0371, THE ATTEND- ANT CAN RE-ENTER THE HELD LOOP. IF THE ATTENDANT EXTENDS THE CALL AGAIN TO EITHER THE SAME DESTINATION OR A NEW DESTINA- TION AND HOLDS THE CALL, THE ATTENDANT IS ONCE AGAIN DENIED RE-ENTRY TO THE LOOP.

LACK OF MACHINE DISCONNECT SUPERVISION IS REFLECTED IN TRUNK GROUP DATA.

IF LOCKOUT IS ENABLED, THE SECRECY OPTION MUST ALSO BE SET (REF- ERENCE F0774 "SECRECY").

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	MULTIPLE CONSOLE OPERATION
Feature no	F0377

DESCRIPTION

DMS-100 EQUIPPED WITH BUSINESS SERVICES WILL PERMIT THE ASSIGNMENT OF A MAXIMUM OF 255 ATTENDANT CONSOLES. THESE CONSOLES CAN BE ASSIGNED TO ONE LARGE CUSTOMER GROUP OR THE CONSOLES CAN BE ASSIGNED TO SEVERAL CUSTOMER GROUPS. DMS-100 WILL PERMIT THE ASSIGNMENT OF A MAXIMUM OF 64 CUSTOMER GROUPS.

A CUSTOMER MAY HAVE A NUMBER OF LOCATIONS WITHIN A CITY ALL SERVED BY THE SMAE DMS-100. THE CUSTOMER MAY WISH TO CENTRALIZE ATTENDANT SERVICE ON A FULL TIME OR PART TIME BASIS FOR THESE LOCATIONS. TO PERMIT CENTRALIZATION OF ATTENDANTS ON ONLY A PART TIME BASIS, EACH OF THE ATTENDANT CONSOLES WILL BE ASSIGNED TO SUBGROUPS. DMS-100 WILL SUPPORT A MAXIMUM OF 8 SUBGROUPS PER CUSTOMER GROUP. DURING REGULAR HOURS, ATTENDANT TYPE CALLS WILL BE DIRECTED TO THE APPROPRIATE ATTENDANT SUBGROUP. WHEN ONE OR MORE OF THE NON CONTROLLING SUBGROUPS ACTIVATES NIGHT SERVICE, THE CALLS NORMALLY DIRECTED TO THE NON CONTROLLING SUBGROUP(S) WILL BE DIRECTED TO THE CONTROLLING ATTENDANT SUBGROUP INSTEAD. SUBGROUP 0 IS ALWAYS THE CONTROLLING SUBGROUP.

IF A CUSTOMER DOES NOT REQUIRE DECENTRALIZED OPERATION, ALL ATTENDANT CONSOLES FOR THE CUSTOMER GROUP WILL BELONG TO SUBGROUP 0.

A CUSTOMER GROUP NEED NOT HAVE AN ATTENDANT CONSOLE. IN THIS CASE, THE CUSTOMER MUST SPECIFY THE ROUTE OR DN TO WHICH ATTENDANT TYPE CALLS MUST BE DIRECTED TO FOR ANSWER.

ONLY THE FIRST TWO FEATURE KEYS ARE DEDICATED IN FUNCTION TO NIGHT SERVICE AND CONSOLE TEST RESPECTIVELY. THE REMAINING 14 FEATURE KEYS AND ASSOCIATED LAMPS CAN BE ASSIGNED TO ANY FEATURES THAT DMS-100 SUPPORTS. IF THE CUSTOMER GROUP HAS MORE THAN ONE ATTENDANT CONSOLE, THE FEATURE KEYS ON EACH CONSOLE CAN BE FLEXIBLY ASSIGNED. THIS ALSO APPLIES TO THE 32 KEYS AND ASSOCIATED LAMPS IF THE CONSOLES ARE EQUIPPED WITH THE OPTIONAL ADD-IN MODULE. FOR MULTIPLE CONSOLE OPERATION, ALL CONSOLES MUST EITHER HAVE OR NOT HAVE THE ADD-IN MODULE.

IN MULTIPLE CONSOLE OPERATION, ALL CALLS REQUIRING ATTENDANT HANDLING ARE QUEUED ON A FIRST IN FIRST OUT (FIFO) BASIS. THE NUMBER OF ATTENDANT CONSOLES WHICH ARE ALERTED TO A CALL REQUIRING ANSWER BY CONSOLE BUZZING AND A FLASHING SOURCE LAMP IS A FUNCTION OF BOTH THE NUMBER OF CALLS WAITING IN THE QUEUE AND THE NUMBER OF CONSOLES IN THE IDLE CONSOLE QUEUE.

PLEASE REFER TO THE FOLLOWING DID'S FOR A COMPLETE DESCRIPTION OF MULTIPLE CONSOLE FEATURE OPERATION AND INTERACTION:

1. V0432 "ATTENDANT SERVICE"
2. V0433 "UNIFORM CALL DISTRIBUTION"
3. V0434 "MULTILISTED DN"
4. V0438 "ATTENDANT HOLD"
5. V0440 "BUSY VERIFICATION - LINE"
6. V0441 "BUSY VERIFICATION - TRUNKS"
7. V0443 "AUTOMATIC ATTENDANT RECALL"
8. V0445 "NIGHT SERVICE - FIXED"
9. V0489 "ATTENDANT CALL SELECTION"
10. V0556 "ATTENDANT CONSOLES"
11. V0557 "TRUNK GROUP BUSY LAMPS"
12. V0560 "POSITION BUSY"

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	MULTIPLE LISTED DIRECTORY NUMBERS
Feature no	F0378

DESCRIPTION

A CUSTOMER MAY HAVE A MULTIPLICITY OF LISTED DIRECTORY NUMBERS (LDN). EACH LDN WILL HAVE A UNIQUE INCOMING CALL IDENTIFICATION (ICI) LAMP SO THAT THE ATTENDANT CAN ANSWER APPROPRIATELY.

THE ONLY LIMIT ON THE NUMBER OF LDN WHICH CAN BE ASSIGNED IS THE NUMBER OF AVAILABLE FEATURE LAMPS AND KEYS ON THE ATTENDANT CON- SOLE.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	STRAIGHTFORWARD OUTWARD COMPLETION
Feature no	F0379

DESCRIPTION

ALL STATION USERS WITHIN THE CENTREX SYSTEM CAN DIAL A "0" TRUNKS TO ATTENDANT AND REQUEST AN OUTGOING LINE. THE ATTENDANT UPON RECEIVING THIS REQUEST CAN DIAL AN OUTGOING CENTRAL OFFICE LINE CALL FOR THAT STATION USER WITHOUT REQUIRING THE STATION USER TO GO ON-HOOK.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	SWITCHED LOOP OPERATION
Feature no	F0380

DESCRIPTION

INCOMING CALLS ARE AUTOMATICALLY PRESENTED TO ONE OF SIX LOOP PICK-UP KEYS ON A CONSOLE ON A FIRST-IN, FIRST-OUT BASIS FROM THE ATTENDANT QUEUE. IF THE ATTENDANT WANTS TO GIVE PRIORITY TO A PARTICULAR TYPE OF WAITING CALL, THE CALL TYPE IS SELECTED BY DEPRESSING THE CORRESPONDING (ICI) INCOMING CALL INDICATOR KEY.

ONCE THE ATTENDANT HAS COMPLETED PROCESSING THE CALL, THE CALLING AND CALLED PARTIES ARE CONNECTED VIA THE NETWORK AND THE CONSOLE LOOP IS IDLE.

SWITCHED LOOP OPERATION IS THE NORMAL MODE OF OPERATION. A LOOP IS ONLY BUSY FOR THE LENGTHS OF TIME REQUIRED BY THE ATTENDANT TO PROCESS A CALL.

ANSWER A CALL THE ATENDANT WILL DEPRESS EITHER A LOOP OR ICI KEY. THE AT-TENDANT THEN CAN

- OPERATE THE RLS KEY. THIS RELEASES THE INCOMING CALL FROM THE LOOP, IDLES THE LOOP AND THE CONSOLE.
- KEY A DESTINATION AND OPERATE THE RLS KEY. THIS CONNECTS THE SOURCE AND DESTINATION, IDLES THE LOOP AND THE CONSOLES. - OPERATE THE HLD/RLS KEY. LOOP REMAINS BUSY, NEW CALLS ARE PRESENTED ON THE NEXT IDLE LOOP.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	THROUGH DIALLING
Feature no	F0381

DESCRIPTION

WARNING - FEATURE DESCRIPTION IS PRELIMINARY

THIS FEATURE PERMITS THE ATTENDANT, AT THE ATTENDANT'S DISCRETION, TO SELECT THE TRUNK FACILITY FOR AN IBN STATION AND "PASS DIAL TONE" TO THE STATION USER. THE STATION USER THEN DIALS THE CALLED NUMBER. THIS FEATURE IS USUALLY USED AS A MANUAL OVERRIDE OF OUTGOING STATION RESTRICTIONS.

THROUGH DIALLING IS COMMONLY REFERRED TO AS "PASSING DIAL TONE". DIAL TONE WILL BE PASSED TO THE ORIGINATOR WHEN THE ATTENDANT CONSOLE RELEASES. THE ORIGINATOR WILL DIAL THE REMAINING DIGITS.

FEATURE RESTRICTIONS _____

STATIONS WITH TOLL RESTRICTED AND SEMI-RESTRICTED SERVICE CAN OVERRIDE THEIR STATION RESTRICTIONS VIA THE THROUGH DIALLING FEATURE. THROUGH DIALING IS NOT PERMITTED FOR FULLY RESTRICTED STATIONS, MANUAL AND AUTOMATIC LINES, STATIONS OUTSIDE OF THE CUSTOMER GROUP AND ANY DMS INCOMING TRUNKS. IN ADDITION, FOR ATTENDANT RESTRICTED LINE (ARE), IT IS POSSIBLE THAT ANY LINE MAY OR MAY NOT BE ABLE TO OVERRIDE THEIR STATION RESTRICTIONS. THIS IS DEPENDANT ON THE LRC OF THE ARE LINE.

FEATURE ACTIVATION _____

A STATION CALLS THE ATTENDANT BY DIALING "0". THE LAMP STATES WILL BE:

SRC LAMP FLASHES AT 120 IPM
 APPROPRIATE ICI LAMP ON
 RLS LAMP OFF

THE ATTENDANT ANSWERS THE CALL BY OPERATING THE LOOP KEY. THE SRC LAMP TURNS STEADY. THE ATTENDANT NOW DIALS THE ACCESS CODE (TYPICALLY 9 OR 8 FOR C.O. AND CCSA ACCESS RESPECTIVELY).

THE ATTENDANT CAN NOW DIAL THE CALLED NUMBER OR RELEASE THE CALL BY DEPRESSING THE RLS KEY AND ALLOW THE STATION TO DIAL THE NUMBER. UPON OPERATION OF THE RLS KEY, THE LAMP STATES WILL BE:

ICI LAMP OFF
 SRC LAMP OFF

DEST LAMP OFF
RLS LAMP ON

INVALID OPERATION _____

IF THE ATTENDANT ATTEMPTS THROUGH DIALING WHERE NOT PERMITTED, ALL DIGITS WILL BE COLLECTED AND AT COMPLETION OF DIGIT COLLECTION, REORDER TONE (120 IPM) WILL BE RETURNED TO THE SUBSCRIBER. THIS APPLIES FOR AN ARE LINE AS NOTED ABOVE.

THROUGH DIALING WILL BE AN IBN CUSTOMER PARAMETER. IT CANNOT BE ASSIGNED TO INDIVIDUAL CONSOLES IN A CUSTOMER GROUP.

DETAILED FEATURE OPERATION _____

THE ATTENDANT CAN MANUALLY VRRIDE A DMS IBN OUTGOING STATION'S RESTRICTION. THE RESTRICTED STATION DIALS THE ATTENDANT I.E. "0" OR SHOULD A TOLL, FULLY OR SEMI-RESTRICTED STATION DIAL A NUMBER NOT PERMITTED, THE CALL WILL BE INTERCEPTED. INTERCEPT WILL RESULT IN OVERFLOW TONE RETURNED TO THE ORIGINATOR OR THE CALL WILL BE QUEUED FOR THE ATTENDANT ACCORDING TO CUSTOMER NEEDS. IN THE LATTER CASE THE ORIGINATOR WILL HEAR AUDIBLE RINGBACK. WHEN THE CALL IS DEQUEUED AND PRESENTED TO THE ATTENDANT, THE INTERCEPT ICI WILL TURN ON. THE NUMBER DIALED BY THE ORIGINATOR BEFORE INTERCEPT IS UNKNOWN AT THIS TIME BY DMS AND THE ATTENDANT.

THE ORIGINATOR MAKES A REQUEST AND THE ATTENDANT, AT HER DISCRETION DIALS AN ACCESS TRUNK, E.G. "9" FOR CO ACCESS. BECAUSE THE SRC IS EARMARKED AS RESTRICTED ACCESS TO THIS TRUNK, THIS ACTION BY THE ATTENDANT CANCELS THE RESTRICTION FOR THIS CALL ONLY. THROUGH DIALING S AN ALLOWED CUSTOMER PARAMETER.

NOT DIAL TONE IS RETURNED TO THE ATTENDANT AND SRC.

THE ATTENDANT HAS A CHOICE.

1. THE ATTENDANT CAN DIAL THE LOCAL, DDD OR IDD NUMBER FOR THE ORIGINATOR AS IN AN ATTENDANT ASSISTED CALL. THE CALL IS COMPLETED USING THE SENDERIZED OPERATION.

5;2. THE ATTENDANT CAN RELEASE THE CALL FROM THE CONSOLE AFTER THE ACCESS CODE HAS BEEN DIALED OR THE ATTENDANT CAN DIAL ONE OR MORE LEADING DIGITS AND THEN RELEASE. THE LATTER CASE INSURES THAT IDDD OR DDD IS NOT BEING USED BY THE STATION. THE ORIGINATOR MUST NOW BE PERMITTED TO FINISH DIALING THE NUMBER. WHEN THE ATTENDANT RELEASES, THE CALL SETUP CONTROL BLOCK WITH THE DIGIT(S) COLLECTED FOR THE CALL THUS FAR AND THE ATTENDANT'S LRC MUST BE TRANSFERRED TO THE NEW CALL DATA BLOCK OF THE

ORIGINATOR'S LINE. IN ADDITION, THE LM MUST BE "KICKED" TO COLLECT THE REMAINING DIGITS FROM THE ORIGINATOR. DIAL TONE IS RETURNED TO THE ORIGINATOR REGARDLESS OF THE NUMBER OF DIGITS DIALED BY THE ATTENDANT.

IF THE ORIGINATOR HAS A DIGITONE LINE, THEN AT THE TIME OF ATTENDANT RELEASE, A DTMF RECEIVER IS CONNECTED TO THE LINE. ONCE AGAIN, THE DIGITS DIALED BY THE ATTENDANT AND THE ATTENDANT'S LRC ARE TRANSFERRED TO THE CALL DATA BLOCK OF THE ORIGINATOR'S LINE AS DESCRIBED ABOVE.

PROVISION IS MADE TO ACCOUNT FOR DP, DTMF OR MF OUTPULSING WHERE A TRUNK IS REQUIRED.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	TWO-WAY SPLITTING
Feature no	F0382

DESCRIPTION

This feature permits the attendant to talk privately to either the calling party or called party. The attendant can alternate between the source or destination as required. Either the source or the destination can be excluded; both cannot be excluded simultaneously.

Exclude source is automatic if the source consists of more than 1 party (call originates in DMS-100) or the attendant is establishing a conference call. The conferees already added to the conference circuit can talk among each other.

Operation of the LOOP key with which the call is associated will cancel any exclusion which may be in effect and will establish a 3 port conference call consisting of the attendant, the source and the destination.

Feature Use

2 way splitting is invoked by depressing the EXCL SRC (Exclude Source) or EXCL DEST (Exclude Destination) key.

The attendant can depress EXCL SRC anytime after answering and before releasing a call. EXCL DEST can be depressed anytime after the destination digits have been outputted or after a connection exists to a DMS served connection (line, announcement, tone).

Feature Interaction

Depressing EXCL SRC is the manual equivalent of Secrecy - reference F0774.

If the attendant depresses EXCL DEST while the source is excluded, the destination will be excluded and the attendant will be connected with the source. If the attendant depresses EXCL SRC while the destination is excluded, the source will be excluded and the attendant will be connected to the destination.

The attendant can exclude a source or destination or depress the loop key (cancelling exclusion) any number of times before depressing release or hold.

When the attendant depresses either release or hold (or automatic hold is invoked), any exclusion that was previously in effect is cancelled.

If the attendant depresses RLS SRC while the destination is excluded, the destination will be reconnected to the attendant. This also applies if the source goes on-hook (non joint control source).

If the attendant depresses RLS DEST while the source is excluded, the attendant will be reconnected with the source if the attendant depresses the loop key.

This also applies if an on-hook is received from a distant switch while the attendant is in a talking connection with the destination.

Lamp States

Depressing EXCL SRC will cause the EXCL SRC lamp to turn ON. Depressing EXCL DEST will cause the EXCL DEST lamp to turn ON.

Depressing EXCL SRC when the destination is already excluded will turn the EXCL SRC lamp ON and the EXCL DEST lamp OFF. The reverse also applies.

Invalid Feature Use

The following are invalid and will be ignored.

- depressing EXCL SRC when the source is excluded.
- depressing EXCL DEST when the destination is excluded.
- depressing RLS SRC or RLS DEST while the source or destination are excluded.
- depressing EXCL SRC if there is no source or EXCL DEST if there is no destination.
- depressing either of these keys while the attendant is not active on a loop.

Feature Restrictions

If the attendant has started to key the destination number and depresses EXCL SRC e.g.

22 EXCL SRC 234

the results may be unpredictable.

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
 Feature set ATTENDANT FEATURES
 Feature UNIFORM CALL DISTRIBUTION FROM QUEUE
 Feature no F0383

DESCRIPTION

CALLS FROM THE ATTENDANT QUEUE ARE UNIFORMLY DISTRIBUTED TO ATTEND-
 ANT CONSOLES AS THEY BECOME IDLE. CALLS ARE DISTRIBUTED ON A FIRST IN,
 FIRST OUT BASIS.

CALL DISTRIBUTION - MULTIPLE CONSOLE OPERATION

THERE WILL BE A QUEUE OF IDLE OCCUPIED POSITIONS. TO BE BOTH IDLE
 AND OCCUPIED, THE CONSOLE MUST MEET ALL OF THE FOLLOWING CONDITIONS:

- A HEADSET MUST BE PLUGGED IN
- THE CONSOLE MUST NOT BE IN THE POSITION BUSY STATE
- NIGHT SERVICE MUST NOT BE ACTIVE
- THE ATTENDANT MUST NOT BE ACTIVE ON A LOOP OR PROGRAMMING
 SPEED CALLING (ATTENDANT SPEED CALLING IS A FUTURE FEATURE)
- ONE OF THE CONSOLE'S 6 LOOPS MUST BE AVAILABLE.

ALL NEW CALL ARRIVALS, INCLUDING RECALLS, ARE PLACED IN THE CALL QUEUE IN
 THE ORDER OF THEIR ARRIVAL. WHILE QUEUED, AUDIBLE RING- BACK TONE WILL
 BE PROVIDED TO THE CALLER BY DMS EXCEPT WHERE RINGING IS PROVIDED BY
 THE ORIGINATING OFFICE. REFERENCE V0480 "2 WIRE GROUND START TRUNK".
 AUDIBLE RINGING WILL BE PROVIDED UNTIL THE CALL IS ANSWERED OR ABANDONED.

WHEN ONE CALL IS WAITING IN THE QUEUE THE MOST IDLE CONSOLE IN THE
 QUEUE OF IDLE OCCUPIED POSITIONS WILL BE ALERTED TO THE CALL BY CONSOLE
 BUZZING. THE SOURCE LAMP OF THE FIRST IDLE LOOP ON THE CONSOLE WILL
 FLASH. THE ICI (IF EQUIPPED) FOR THE CALL TYPE WILL TURN ON.

IF TWO CALLS ARE WAITING IN THE QUEUE, THE MOST IDLE AND SECOND MOST
 IDLE CONSOLES IN THE IDLE OCCUPIED POSITIONS QUEUE WILL BE ALERTED BY
 CONSOLE BUZZING. THE SOURCE LAMP OF THE FIRST IDLE LOOP ON EACH OF THE
 CONSOLES WILL FLASH. IF THE CALL TYPE DIFFERS FOR THE TWO CALLS,
 THE TWO APPROPRIATE ICI (IF EQUIPPED) WILL TURN ON AT BOTH CONSOLES. IN
 THE SECOND INSTANCE ABOVE, WHEN ONE OF THE TWO ATTENDANTS DEPRESSES
 THE LOOP KEY ASSOCIATED WITH THE FLASHING SOURCE LAMP:

- THE CONSOLE WILL BE REMOVED FROM THE QUEUE OF IDLE OCCUPIED

POSITIONS.

- THE OLDEST CALL WAITING IN THE QUEUE WILL BE DEQUEUED AND WILL BE PRESENTED ON THE LOOP.
- THE SOURCE LAMP WILL CHANGE FROM FLASHING TO ON.
- THE DESTINATION LAMP WILL BE UPDATED TO REFLECT THE CALL TYPE.
- THE ICI WHICH CORRESPONDS TO THE DEQUEUED CALL WILL REMAIN ON.
- THE OTHER ICI WILL TURN OFF.
- THE ICI LAMPS ON THE OTHER ATTENDANT CONSOLE WILL BE UPDATED TO REFLECT THE TYPE OF CALL STILL REMAINING IN THE QUEUE.

THE ATTENDANT CAN ALSO SELECTIVELY ANSWER A CALL TYPE BY DEPRESSING AN ICI KEY WHOSE ASSOCIATED LAMP IS ON OR FLASHING. IF THE ATTENDANT DEPRESSES AN ICI KEY:

- THE CONSOLE WILL BE REMOVED FROM THE IDLE OCCUPIED POSITION QUEUE.
- THE OLDEST CALL OF THE SELECTED TYPE WILL BE DEQUEUED AND WILL BE PRESENTED ON THE LOOP.
- THE LAMP ASSOCIATED WITH THE ICI KEY WHICH WAS DEPRESSED WILL REMAIN ON IF PREVIOUSLY ON OR CHANGE FROM FLASHING TO ON.
- THE OTHER ICI LAMP WILL TURN OFF.
- THE ICI LAMPS ON THE OTHER ATTENDANT CONSOLE WILL BE UPDATED TO REFLECT THE TYPE OF CALL STILL REMAINING IN THE QUEUE.

THE ATTENDANT WHO ANSWERED WILL BE CONNECTED TO THE CALLING PARTY. WHEN THE ATTENDANT HAS DISPOSED OF THE ANSWERED CALL, THE CONSOLE WILL GO TO THE BOTTOM OF THE IDLE OCCUPIED POSITION QUEUE. REFERENCE ALSO V0489 "ATTENDANT CALL SELECTION".

THE NUMBER OF CONSOLES THAT ARE ALERTED TO QUEUED CALLS WAITING FOR ANSWER IS A FUNCTION OF BOTH THE NUMBER OF CONSOLE WHICH ARE IDLE AND OCCUPIED AND THE NUMBER OF QUEUED CALLS. NOTE THAT A CONSOLE DOES NOT "OWN" A CALL UNTIL EITHER THE LOOP OR ICI KEY IS DEPRESSED. A FLASHING SOURCE LAMP INFORMS THE ATTENDANT ON WHICH ASSOCIATED LOOP A CALL WILL BE PRESENTED ON AFTER ANSWER, ON OR FLASHING ICI INFORM THE ATTENDANT OF THE QUEUED CALL TYPES WHICH CAN BE SELECTIVELY ANSWERED.

ICI LAMPS ARE UPDATED IN REAL TIME. EACH TIME AN ATTENDANT ANSWERS A CALL, THE ICI LAMPS ON ALL CONSOLES WHICH ARE BEING NOTIFIED OF WAITING QUEUED CALLS WILL BE UPDATED - E.G. - IF THE ANSWERED CALL WAS THE ONLY CALL OF ITS' TYPE WAITING IN THE QUEUE, THIS ICI LAMP WILL

TURN OFF AT ALL AFFECTED POSITIONS. IF, AFTER ANSWER, THE ICI THRESHOLD IS NO LONGER VIOLATED, THE ICI LAMPS AT ALL AFFECTED CONSOLES WILL CHANGE FROM FLASHING TO ON. THE PRECEDING ALSO APPLIES TO CALLS WHICH ARE ABANDONED WHILE WAITING IN THE QUEUE.

HELD LOOP RECALLS ARE NOT QUEUED FOR IDLE CONSOLES. AS LONG AS A HEADSET IS SEATED, THE HELD LOOP RECALL IS PRESENTED ON THE SAME CONSOLE AND LOOP ON WHICH IT WAS ORIGINALLY HELD.

WHEN 1 CALL IS WAITING IN THE QUEUE, THE CALL WAITING LAMP WILL TURN ON AT ALL POSITIONS WITH A HEADSET PLUGGED IN.

WHEN THE CALL IS ANSWERED OR ABANDONED AND NO FURTHER CALLS ARE WAITING IN THE QUEUE, THE CALL WAITING LAMP WILL TURN OFF AT ALL POSITIONS.

CALLS WHICH ARE ABANDONED WHILE WAITING IN THE QUEUE WILL BE REMOVED FROM THE QUEUE. CONSOLES WHICH BECOME EITHER BUSY OR NOT OCCUPIED WILL BE REMOVED FROM THE IDLE OCCUPIED POSITION QUEUE.

WHEN ALL HEADSETS ARE UNPLUGGED, THE LAST OCCUPIED POSITION DEPRESSES THE POSITION BUSY KEY OR THE NIGHT KEY, NIGHT SERVICE WILL BE INEFFECT. NEW CALLS AND RECALLS WILL BE ROUTED TO THE APPROPRIATE NIGHT SERVICE TREATMENT.

FEATURE RESTRICTIONS _____

ALL ATTENDANT CONSOLES ARE TREATED EQUALLY. NO PROVISION IS MADE TO MATCH AN ATTENDANT'S CALL HANDLING CAPABILITIES WITH CALL TYPES IN THE QUEUE. THE QUEUE WILL ONLY BE SEARCHED FOR A SUITABLE CALL TYPE WHEN THE ATTENDANT DEPRESSES AN ICI KEY WHOSE LAMP IS ON OR FLASHING.

QUEUE LENGTH THRESHOLD _____

THE LENGTH OF THE QUEUE CAN BE LIMITED BASED ON THE MAXIMUM PERMISSIBLE TIME THAT A CALL CAN WAIT IN THE QUEUE. CALLS WHICH WILL EXCEED THE ESTIMATED TIME THRESHOLD AND ROUTED TO EITHER BUSY TONE OR ANNOUNCEMENT. THE DIVERSION THRESHOLD CAN RANGE FROM 4 SECONDS TO 17 MINUTES IN 4 SECOND INCREMENTS. IT CAN BE SPECIFIED AS INFINITE IN WHICH CASE IT IS SET TO ZERO SECONDS.

CALL WAITING FLASH THRESHOLD _____

THE CALL WAITING LAMP WILL FLASH WHEN CALLS ARE WAITING IN THE QUEUE FOR A TIME EQUAL TO OR GREATER THAN A SPECIFIED THRESHOLD. THIS THRESHOLD CAN RANGE FROM 4 SECONDS TO 4 MINUTES 12 SECONDS IN 4 SECOND INTERVALS. IT CAN ALSO BE SPECIFIED AS INFINITE IN WHICH CASE IT IS SET TO ZERO SECONDS.

INCOMING CALL IDENTIFICATION (ICI) FLASH THRESHOLD

ICI LAMPS WILL FLASH WHEN CALLS OF A SPECIFIC TYPE ARE WAITING IN THE QUEUE FOR A TIME EQUAL TO OR FEATER THAN A SPECIFIED THRESH- OLD. THIS THRESHOLD CAN RANGE FROM 4 SECONDS TO 4 MINUTES 12 SECONDS IN 4 SECOND INTERVALS. IT CAN ALSO BE SPECIFIED AS INFI- NITE IN WHICH CASE IT IS SET TO ZERO SECONDS. THERE IS ONE ICI FLASH THRESHOLD.

FEATURE IMPLICATIONS SPECIFIC TO KODAK

CALLS INCOMING ON NT5X25 TRUNKS SHOULD NOT BE ROUTED TO BUSY TONE OR AN- NOUNCEMENT IF THE QUEUE LENGTH THRESHOLD IS EXCEEDED (THIS ASSUMES THAT KODAK HAS NOT SPECIFIED AN INFINITE VALUE). TO ROUTE SUCH CALLS TO BUSY TONE OR ANNOUNCEMENT REQUIRES THAT ANSWER SUPERVISION BE SENT TO THE OTHER OFFICE TO TRIP RINGING AND HAVE THE CALLER HEAR BUSY TONE OR ANNOUNCEMENT. IN THE CASE OF LDN CALLS, THE CALLING PRTY CAN BE MESSAGE RATE, COIN OR TOLL. IF A THRESHOLD HAS BEEN SPECIFIED AND IT IS EX- CEDED, SUCH CALLS SHOULD CONTINUE TO RING UNTIL THE CALLING PARTY ABAN- DONS.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	ATTENDANT SERVICE	LOCAL CONSOLE	
Feature no	F0384		

DESCRIPTION

THIS FEATURE PROVIDES A FLEXIBLE ARRANGEMENT FOR THE LOCATION OF AN ATTENDANT CONSOLE.

FOR LOCAL ATTENDANT SERVICE, THE CONSOLES ARE LOCATED WITHIN LOOP RANGE OF THE DMS 100.

REMOTE ATTENDANT SERVICE CONSOLES ARE CONNECTED WITHIN LOOP RANGE TO A REMOTE LINE MODULE OF THE SERVING DMS 100.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	ATTENDANT SERVICE	REMOTE CONSOLE	
Feature no	F0385		

SEE FEATURE NUMBER F0384

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	ATTENDANT SERVICE (CENTRALIZED, CITY WIDE)
Feature no	F0387

DESCRIPTION

THIS FEATURE ENABLES THE SYSTEM TO PROVIDE UNIFORM NUMBERING AND UNIFORM SERVICES TO EVERY STATION USER WITHIN A CUSTOMER GROUP, REGARDLESS OF HIS LOCATION, WHEN THE CORRESPONDING CUSTOMER HAS MULTIPLE LOCATIONS (WITHIN AND/OR AROUND A CITY) AND THE CUSTOMER GROUP IN EACH LOCATION IS SERVED BY THE SAME DMS 100 (DIRECTLY OR VIA RLM). THE ATTENDANT POSITIONS, FOR SUCH A MULTI-LOCATION CUSTOMER, MAY ALSO BE CENTRALIZED ON A FULL TIME BASIS OR FOR NIGHT AND WEEKEND SERVICE ONLY.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	CLASS OF SERVICE RESTRICTIONS FULLY RESTRICTED SER
Feature no	F0388

DESCRIPTION

This feature provides the capability to allow or deny features on an individual station basis. The restrictions can be arranged to control all calls originating from and/or terminating on stations and tie trunks.

The following defines DMS-100 station and trunk group Class of Service Restrictions available at Kodak K.

LCC (Line Class Code)

This defines the type of line. Available LCC for DMS-100 Business Services are:

IBN - An IBN station (A station directly served by DMS-100) IBN means Integrated Business Network

LDN - A listed directory number which will be assigned to an ICI on one or more consoles in the customer group

DNA - Directory (station) number used as a BXX (Access) code. This conserves the use of access codes for very small groups.

LRC (Line Restriction Code)

This field will be used to define the restriction applicable to 9+ and attendant (0) type calls originated by IBN stations. This is a 3-bit field and can be used to define:

- stations permitted to dial anywhere (unrestricted)
- stations permitted access to the exchange network only via the attendant (semi-restricted)
- stations not permitted access to the exchange network, either by dialing or via the attendant (fully restricted) - see below.

- stations not permitted access to the exchange network or attendant - see below.
- the serving NPA for IBN stations. For example, 2 stations, can be physically located in 2 different NPA. The LRC will define the line attribute index, and therefore the SNPA.
- Other uses.

Alternate Line Restriction Code

This field will be used for Attendant Control of Trunk Group Access.

Note that LRC and ALRC specify originating, NOT terminating capabilities.

Two broad categories of "fully restricted" have been designed and can be specified by LRC assignment. A description follows:

- Fully Restricted (FRE). FRE stations are denied access to both the exchange network and the attendant. If the code assigned to access either is dialed, intercept treatment results.
- Attendant Restricted (ARE). ARE stations are denied access to the exchange network by dialing. The following can be specified for ARE stations, on an individual station basis:
 - if the station dials "0", the ICI category. This can be either "Attendant" or "Fully Restricted" for attendant console display.
 - if the station dials "9", the treatment. This can be reorder tone, announcement or vacant code.
 - the capability of the attendant to override this station's restriction. If the station's flag is set, the attendant can, at the attendant's discretion, extend the call. If the station's flag is not set, the attendant cannot extend the call.

The ARE and FRE categories were designed to allow for the Scope Dial requirements to allow the attendant override capabilities of station restrictions.

LSC (Line Screening Code)

This field will define the restrictions applicable to IBN customer trunk groups for both IBN stations and trunk-to-trunk connections.

Specifically, this will be used to define:

- a station's access to a specific FX, tie trunk and/or Outwats group
- access to code calling, paging, dial dictation, etc.
- access to CCSA/EPSCS
- trunk-to-trunk connections per trunk group
- other uses

This is a 5 bit field.

Outgoing trunk groups, to which LSC are applicable, will have included in their data a 32-bit flag field (e.g., 2 16-bit data words containing bit positions 0-15, 16-31). Access to a particular trunk group by a line or incoming trunk group will depend on the trunk group's flag field bit position number corresponding to the LSC of the originating line or trunk group.

Alternate Line Screening Code

This field will be used for Attendant Control of Trunk Group Access. This feature will not be available at Kodak K.

Note that LSC and ALSC specify a station or trunk group's originating, not terminating capabilities.

Non LRC, LSC Originating Options and Features

DOR Denied Origination. DOR can be assigned to lines only. If assigned, the line (station) cannot originate a call.

FIG Flash Ignore. Lines assigned FIG do not have switch hook flash privileges.

FTD FX Toll Diversion. This option will deny a station the ability to place a toll call after having accessed an FX line (trunk). A reversal is received from the distant office to indicate that a toll call has been placed. DMS will give the appropriate intercept treatment.

MAN Manual Line. When an off-hook is reported for a manual line, the call is queued for an attendant. The appropriate ICI will be lit.

Manual lines usually do not have dials or DTMF key pads. However, a regular set can also be used since, for DMS-100, this feature means no signaling. Therefore, DMS-100 does not expect and will not collect any signals (pulses or DTMF tones) from such stations.

AUL Automatic Line. When an off-hook is reported and AUL is assigned, a connection is made to a predetermined location. This predetermined location can also be served by DMS-100 or it can involve outpulsing. The stored number can be from 1 to 11 digits in length. Pause insertion is not possible.

SPB Special Billing. POTS feature available to Kodak. This feature permits a billing DN, other than the station's DN, to be written to tape. For SMDR, the SPB DN, not the station DN is used if this feature is assigned to the line. The SPB DN must be a 7 or 10 digit number of the North American numbering plan format. This feature is probably of limited value to Kodak.

It is useful for class 5 IBN in a hospital environment where a patient's calls can be billed to an SPB, say, the patient's home number. It is also useful in a university application. In both suggested applications, it is assumed there is a line assigned to each patient or student.

Terminating Options and Features

CLI Calling Line Identification. POTS option available to Kodak.

DTM Denied Termination. POTS option available to Kodak.

NDC No Double Connect. POST option available to Kodak. This option should be assigned to data lines.

CLF Calling Line Identification with Flash. Also referred to as Malicious Call Trace. POTS option available to Kodak.

DIN Denied Incoming. If this option is assigned, the line cannot receive calls from outside the customer group. This will include all calls incoming via trunks, regardless of intragroup flags. The attendant cannot complete incoming calls to the station if the call originates outside the customer group unless DIN is modified by a Terminating Restriction Code.

TRC (Terminating Restriction Codes)

TRC will be assigned on a per line basis. When TRC are assigned to a line, the TRC can modify option DIN. Therefore TRC can only be assigned to lines with option DIN.

TRC will consist of 2 8-bit fields; the first 8 bits will specify the station's ability to receive direct dialed calls. The second set of 8 bits will specify the station's ability to receive these calls via the attendant.

To avoid a proliferation of data for POTS lines (DMS-100 is a class 5 and serves both POTS and IBN lines) the first bool of the 2 8-bit fields will be hard coded for DID and LDN traffic. This will also apply to PBX. The remaining can be flexibly assigned.

If any station in the customer group is assigned TRC, all incoming and two way trunk groups must also be assigned TRC. Trunk TRC will be a 3-bit field (0 to 7).

When a call is received on a trunk, the TRC is checked and compared against the appropriate bit in the line's first 8 bit TRC flag field. If set (true), the call is allowed. If false, the appropriate bit in the line's second 8 bit TRC flag field will be checked. If true, the call is allowed via the attendant only. The call will be queued for the attendant. The ICI category will be intercept. If false, the call will be given blank DN treatment.

TRC will permit or deny a station to receive one or more of the following call types (these are examples only).

- DID
- LDN
- EPSCS/CCSA
- FX
- ESN/ETN
- Inwats
- Tie Trunk calls from various locations
- etc

The preceding will also avoid having to hardwire network types into DMS-100.

Intercept

Disallowed called, except as described in TRC will be given an appropriate treatment. Treatments will include:

- Intercept to the attendant
- Announcement
- Tone

Line Options and Features

POTS options and features (both office and line) are covered in various NTPs. Only a few are covered here. Reference various Kodak DIDs for new IBN options and features.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	CLASS OF SERVICE RESTRICTIONS SEMI-RESTRICTED SERV
Feature no	F0389

SEE FEATURE NUMBER F0388

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set SERVICES
Feature CLASS OF SERVICE RESTRICTIONS UNRESTRICTED SERVICE
Feature no F0390

SEE FEATURE NUMBER F0388

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	CODE CALL ACCESS
Feature no	F0391

DESCRIPTION

WARNING - FEATURE DESCRIPTION IS PRELIMINARY

THIS FEATURE PERMITS STATIONS AND ATTENDANTS TO ACCESS CUSTOMER PROVIDED CODE CALL EQUIPMENT BY DIALING AN ACCESS CODE (E.G. 1XX) AND A 2 OR 3 DIGIT CALLED PARTY CODE. THE CALLED PARTY CODE IS TRANSFERRED TO THE CODE CALL EQUIPMENT, WHICH IN TURN ACTIVATES CUSTOMER PROVIDED VISUAL/AUDIBLE SIGNALLING DEVICES TO ALERT THE CALLED PARTY. THE CALLED PARTY CAN BE CONNECTED TO THE CALLING PARTY BY DIALING AN ANSWER CODE FROM ANY UNRESTRICTED STATION WITHIN THE SYSTEM.

FEATURE RESTRICTIONS _____

FEATURE ACCESS IS LIMITED TO INTRA-GROUP STATIONS AND ATTENDANTS ONLY VIA DTMF OR DP SIGNALLING.

ACCESS TO CODE CALL EQUIPMENT IS SUBJECT TO ORIGINATING STATION CLASS OF SERVICE RESTRICTIONS DEFINED AS A LSC.

NO INHERENT QUEUING CAPABILITY IS PROVIDED WITH THE CODE CALL ACCESS FEATURE. IF A STATIONS DIALS THE CODE CALL ACCESS CODE AND THE EQUIPMENT IS ALREADY IN USE, HE RECEIVES BUSY TONE AND MUST REDIAL AT A LATER TIME. IF, HOWEVER, A LINE HAS THE "RING AGAIN" FEATURE, THEN THAT FEATURE MAY BE APPLIED TO CODE CALL ACCESS.

A TIMEOUT PERIOD WILL APPLY TO THE CODE CALL ACCESS LINE. IF A STATION DIALS THE ACCESS CODE PLUS A CALLED PARTY CODE, THE CODE CALL ACCESS LINE WILL REMAIN SEIZED UNTIL THE TIMEOUT PERIOD IS REACHED.

NO VALIDITY CHECK OF CALLED PARTY CODES WILL BE DONE.

FEATURE OPERATION _____

ORIGINATING STATION ACCESS

A STATION (DP OR DTMF SET) ACCESSING THE CODE CALL FETURE GOES OFF-HOOK, RECEIVES DIAL TONE, AND DIALS THE CODE CALL ACCESS CODE (E.G. 1XX). DMS RESERVES THE CODE CALL EQUIPMENT AND RETURNS DIAL TONE, (SENDERIZED OPERATION) TO THE ORIGINATOR, WHO THEN DIALS THE CALLED PARTY CODE ASSIGNED TO THE PERSON BEING SOUGHT, AND WAITS OFF-HOOK. AUDIBLE RINGING TONE IS RETURNED.

DMS WILL SEIZE THE CODE CALL LINE CIRCUIT AND CONNECT A DTMF SENDER TO THE LINE.

THE CALLED PARTY CODE IS SENT TO THE CODE CALL EQUIPMENT VIA DTMF SIGNALING. THEREFORE, A NETWORK CONNECTION IS REQUIRED BETWEEN THE DTMF SENDER AND THE CODE CALL LINE.

A NETWORK CONNECTION BETWEEN THE CODE CALLING EQUIPMENT AND THE CALLING PARTY IS NOT REQUIRED.

THE CUSTOMER PROVIDED CODE CALL EQUIPMENT THEN GENERATES A SPECIFIC VISUAL/AUDIBLE SIGNAL BASED ON THE DIGITS RECEIVED.

CALLED PARTY ANSWER _____

THE CALLED PARTY, ON RECOGNIZING HIS ASSIGNED VISUAL/AUDIBLE CODE, GOES OFF-HOOK FROM ANY UNRESTRICTED STATION (I.E. MUST BE ABLE TO DIAL RESPONSE CODE), RECEIVES DIAL TONE, AND DIALS THE CODE CALL RESPONSE CODE (E.G. 1XX). THE RESPONSE CODE IS IDENTICAL FOR ALL ASSIGNED USERS, I.E., THERE IS A SINGLE RESPONSE CODE PER CODE CALL SYSTEM. NOTE: THERE MAY BE MANY CODE CALL SYSTEMS.

A CODE CALL ACCESS STATUS CHECK IS INITIATED TO DETERMINE IF AN ACTIVE CODE CALL REQUEST EXISTS IN THE SYSTEM FOR THIS INTRA-GROUP, FOLLOWED BY AN IDENTITY SEARCH FOR THE ORIGINATING STATION.

THE CODE CALL EQUIPMENT IS TAKEN DOWN. A NETWORK CONNECTION IS ESTABLISHED BETWEEN THE ORIGINATING STATION AND THE ANSWERING STATION, AND THE CODE CALL ACCESS LINE IS RELEASED.

ATTENDANT ACCESS TO CODE CALL

ATTENDANT ACCESS TO CODE CALL SHOULD, IN A PRACTICAL ENVIRONMENT, BE DISCOURAGED SINCE A CODE CALL RESPONSE WILL NOT NECESSARILY BE DIRECTED TO THE ATTENDANT POSITION WHICH INITIATED THE REQUEST, NOR WILL THE ANSWERING POSITION, (A) BE AWARE THAT A CODE CALL REQUEST HAS BEEN INITIATED OR, (B) KNOW THE IDENTITY OF THE POSITION INITIATING THE REQUEST.

CODE CALL RESPONSE WILL REQUIRE QUERYING AMONG THE ATTENDANT POSITIONS TO IDENTIFY THE SOURCE POSITION, AND INVOKING THE "INTERPOSITION CALLING" FEATURE TO EXTEND THE ANSWERING STATION TO THE PROPER ATTENDANT POSITION.

THE FOLLOWING ASSUMES THAT THE ATTENDANT HAS ANSWERED AN INCOMING CALL WHICH REQUIRES CODE CALL ACCESS. TO INITIATE A CODE CALL, THE ATTENDANT WILL KEY THE ACCESS CODE. (NOTE: NO DIAL TONE RETURNED TO ATTENDANT) FOLLOWED BY A PARTY CODE AND BECAUSE DTMF IS REQUIRED BY THE CODE CALL EQUIPMENT A DIGITONE SENDER MUST BE CONNECTED TO THE CODE CALL ACCESS LINE. THE PARTY CODE IS SENT TO THE CODE CALL ACCESS LINE VIA DTMF

TONES. WHEN THE OUTPULSING OF DIGITS IS COMPLETED, THE DTMF SEN- DER IS DISCONNECTED.

A NETWORK CONNECTION BETWEEN CODE CALL EQUIPMENT AND ATTENDANT LOOP IS NOT NECESSARY.

AFTER THE ABOVE KEYING SEQUENCE, THE ATTENDANT WILL BE ABLE TO:

- WAIT FOR ANSWER (THE CALLED PARTY DIALS THE ANSWERING CODE). THE ANSWERING PARTY WILL BE PRESENTED ON THE DESTINATION SIDE OF THE LOOP. IF THE SECRECY OPTION (REFERENCE F0774) IS NOT SET, THE ATTENDANT, CALLING AND CALLED PARTIES WILL BE INVOLVED IN A 3-WAY CONFERENCE CALL.
- RELEASE THE CALL VIA THE RELEASE KEY. IF THE CALLED PARTY DIALS THE ANSWERING CODE PRIOR TO EXPIRY OF THE AUTOMATIC RECALL TIMER, DMS WILL CONNECT THE CALLING AND CALLED PARTIES. NOTE THAT PRIOR TO ANSWER, THE CALLING PARTY WILL HEAR QUIET TONE (SILENCE).
- HOLD THE CALL. REFERENCE ATTENDANT F0374 "HOLD".

IF THE ATTENDANT DOES NOT WAIT FOR ANSWER, THE CALL WILL BE SUB- JECT TO AUTOMATIC RECALL (F0371) WHEN THE CALLED PARTY DIALS THE RESPONSE CODE OR THE TIMER EXPIRES.

DMS WILL USE AN INTERNAL CUSTOMER SET TIMER WITH VALUES FROM 15 TO 180 SECS IN INCREMENTS OF 1 SEC.

FEATURE ACTIVATION _____

THIS FEATURE WILL BE ALLOWED OR DENIED TO ANY STATION BASED ON LINE GROUP ACCESS RESTRICTIONS.

THIS FEATURE WILL BE ACTIVATED AT THE SYSTEM LEVEL ON INCLUSION OF A DN FOR CODE CALL ACCESS IN THE LINE DATA, AND AT THE STATION LEVEL WHEN THE CODE CALL ACCESS CODE IS DIALED.

FEATURE DEACTIVATION _____

THIS FEATURE WILL BE DEACTIVATED AT THE SYSTEM LEVEL BY REMOVAL OF THE DN FOR CODE CALL ACCESS FROM THE LINE DATA, AND AT THE STATION LEVEL BY A CHANGE IN LINE GROUP ACCESS RESTRICTIONS.

INVALID FEATURE OPERATION _____ A STATION NOT AS- SIGNED ACCESS TO CODE CALL WILL BE GIVEN INTER- CEPT TREATMENT ON DIALING THE ACCESS CODE.

IF THE ORIGINATING STATION ABANDONS THE CODE CALL AFTER VISUAL/AUDIBLE SIGNALLING HAS BEEN INITIATED BUT PRIOR TO CALLED PARTY ANSWER, THEN THE CALLED PARTY, ON DIALING THE ANSWER CODE, WILL RECEIVE INTERCEPT TREATMENT.

A STATION DIALING THE CODE CALL RESPONSE CODE, WHEN NO CODE CALL ACCESS REQUEST IS ACTIVE IN THE SYSTEM, WILL BE GIVEN INTERCEPT TREATMENT.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	DATA CALL PROTECTION
Feature no	F0393

DESCRIPTION

THE DATA CALL PROTECTION FEATURE PREVENTS INTERRUPTION OR MULTI- LATION OF DATA CALLS CAUSED BY THE APPLICATION OF WARNING TONES AND VOICE ENERGY ASSOCIATED WITH THE FOLLOWING FEATURES

- ATTENDANT CAMP-ON IF CAMP-ON TONE IS A CUSTOMER-GROUP PARAMETER - BUSY VERIFICATION - BUSY OVERRIDE - CALL WAITING

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	DICTATION ACCESS AND CONTROL (DTMF ONLY)
Feature no	F0394

DESCRIPTION

THIS FEATURE PERMITS ACCESS TO CUSTOMER-PROVIDED DICTATION EQUIPMENT FROM STATION USERS WITHIN THE CUSTOMER GROUP, AND MAINTAINS TELEPHONE DIAL CONTROL OF ALL NORMAL DICTATION SYSTEM FEATURES. CONTROL FROM DTMF SETS AND PROPRIETARY SETS IS PROVIDED.

A CODE IS KEYED TO ACCESS THE DICTATION RECORDING EQUIPMENT AND CONTROL SIGNALS ARE SENT BY TRANSMITTING DTMF LINES OVER THE VOICE PATH. ACCESS TO DICTATION EQUIPMENT CONTROL IS SUBJECT TO ORIGINATING CLASS OF SERVICE RESTRICTION.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	DIRECT INWARD DIALLING (DID)
Feature no	F0395

DESCRIPTION

Incoming calls from the exchange network (not special circuits e.g. FX, Wats), may reach a specific customer group station without attendant assistance. The calling party dials the 7 digit directory number to reach the station.

Feature Requirements

DID Traffic Terminating At Lines Served by DMS

1. DID to fully restricted stations is denied by assigning Denied Incoming (DIN) to the directory number. (Frequently, such stations are not assigned a DID number).
2. DID calls to unassigned DID numbers and to fully restricted stations will be routed to either the appropriate announcement or to the attendant. If to announcement, answer supervision will not be returned to the local CO. by DMS.
3. DMS will receive from 4 to 7 digits. Pulsing can be DP, DTMF or MF. If DTMF or MF, DMS must connect a DTMF or MF receiver.
4. A standard loop 900 ohm trunk will be used.

DID Tandem Traffic (DMS is tandem)

1. DMS will receive from 4 to 7 digits from the local C.C. Pulsing can be DP, DTMF or MF. IF DTMF or MF, DMS must connect a DTMF or MF receiver.
2. Translation of thousands or hundreds digit is required to determine routing and outpulsing requirements. (The number received can be for a line served by DMS or for a line served by another PBX).
3. Outpulsing can be DP, MF or DTMF over interbuilding tie trunks (standard existing DMS trunks).

Specific Kodak DID Digit Reception/Outpulsing

DMS will be receiving 5 digits in DP from the #1ESS machine for DID calls. These calls can be for lines served by DMS as well as lines served by other PBX. Thousand digit translation is required. DMS will outpulse 4 digits to the other PBX in DP (buildings 26 and 313) and MF (building 12).

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	DIRECT OUTWARD DIALLING (DOD)
Feature no	F0396

DESCRIPTION

A station can place external calls to the exchange network without attendant assistance by dialing the DCD access code (usually "9"), receiving second digit tone and dialing the external number. External as used here means outside the customer group.

Feature Restrictions

1. The DOD access code can be any digit (0 to 9) but must be a single digit.
2. Senderized operating only applies. Where required, DMS will return second dial tone. Therefore, hearing second dial tone does not guarantee a station an outgoing trunk.
3. DOD access for customer group stations served by RLMS is via the host DMS-100 only.
4. Where the DOD interface at the class 5 office is a line appearance, only ground start operation will be supported. DMS will not detect dial tone from the class 5 via a tone detector; DMS will treat operation of relay A7 in NT5X25 as a "proceed to send" signal.
5. PBX AIOD per EL 1027, 1598, etc, is not supported. This means DMS will not transmit a calling number to the class 5 using PBX protocol. Therefore the class 5 will bill all DOD chargeable calls to the LDN.
6. The attendant will not hear dial tone following the DOD. Access code in a senderized environment.

Feature Requirements

1. Access to DOD is subject to station restrictions. Each station is assigned a Line Restriction Code (LRC) which defines the restrictions applicable to DOD calls e.g. unrestricted, semi restricted, fully restricted. Reference F0388 "Class of Service Restrictions".

2. Access to specific NXX or NPA/NXX is subject to station restrictions. Reference F0776 "Code Restrictions".
3. Fully restricted stations are not permitted DOD access via the attendant. Reference F0388 "Class of Service Restrictions".
4. For Kodak, outpulsing to the C.O. will be DP. In other PBX applications it can also be DTMF. (Reference comments below)
5. The DOD access code will not be outpulsed to the C.O.
6. All restriction checking (station restrictions, code restrictions, etc.) will be done by DMS.
7. Overlap outpulsing will not apply to DOD calls. (Reference comments below)
8. CDR will apply. Reference V0463 "Station Message Detail Recording".
9. The following can be used with DOD:
 - Call Forward Universal - ref. F0410
 - Call Transfer - ref. F0414
 - 3 Way Calling - ref. F0414
 - Speed Calling Individual and Group - ref. F0416, F0419
10. Stations dialing 9 plus the customer group LDN can be blocked, if required. This is an existing pretranslator capability.

Notes:

1. For Kodak, outpulsing to the local CO may be DTMF, provided that the necessary hardware can be delivered by NT on time.
2. Overlap outpulsing may be available for DOD traffic, however, this is not a promised to gating feature.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	FLEXIBLE INTERCEPT
Feature no	F0397

DESCRIPTION

THIS FEATURE PERMITS THE SYSTEM TO INTERCEPT ANY CALL TO UNAS-SIGNED NUMBERS, TEMPORARY DISCONNECT LINE, VACANT CODE, TOLL RESTRICTED, CHANGE NUMBER, OUT OF SERVICE LINE, ETC. CALLS TO THESE NUMBERS WILL RECEIVE WITH ONE OF THE FOLLOWING TREATMENTS:

1. AN OVERFLOW TONE
2. COMMON RECORDED ANNOUNCEMENT
3. RECORDED ANNOUNCEMENT, UNIQUE TO THE CUSTOMER GROUP
4. INTERCEPT TO CUSTOMER GROUP ATTENDANT ONLY CALLS WHICH ARE ROUTED TO AN ATTENDANT WILL RECEIVE ANSWER SUPERVISION AND BE RECORDED FOR PURPOSES OF CHARGING.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	NIGHT SERVICE	TRUNK ANSWER FROM AN	
Feature no	F0403		

SEE FEATURE NUMBER F0402

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	OFF PREMISES STATIONS AND EXTENSIONS
Feature no	F0405

DESCRIPTION

THIS FEATURE PERMITS STATIONS (ALL TYPES) WHICH ARE LOCATED REMOTE FROM THE CUSTOMER'S PREMISES TO ACCESS THE SERVICE AVAILABLE TO A MAIN STATION SET. OFF PREMISE EXTENSIONS ARE CONNECTED TO THE REMOTE LINE MODULE (RLM) OR HUB OF THE SAME SERVING DMS 100 OFFICE AS THE CUSTOMER'S MAIN PREMISES.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	INDIVIDUAL LINE BUSINESS SERVICE - PBX APPLICATION
Feature no	F0406

DESCRIPTION

THIS APPLIES TO A SPECIAL SERVICE LINE, SUCH AS FOREIGN EXCHANGE, OUTWATS, INWATS, OR INDIVIDUAL BUSINESS LINE, TO BE ASSOCIATED WITH A TYPE 500 OR 2500 SET OR WITH A DIRECTORY NUMBER KEY ON CONVENTIONAL KEY SETS OR PROPRIETARY SETS. THIS FEATURE IS ONLY RESTRICTED TO THE USERS OF THE STATIONS WHICH HAVE APPEARANCES OF THE ASSOCIATED DIRECTORY NUMBER. THE USUAL MULTIPLE APPEARANCE DIRECTORY NUMBER FEATURES APPLY WITH THE PRIVATE LINE APPEARANCE:

- AUTOMATIC PRE-SELECTION - PRIME DIRECTORY NUMBER - COMMON AUDIBLE SIGNALLING - PRIVACY - PRIVACY RELEASE

IN ADDITION, THE FOLLOWING FEATURES MAY BE USED IN CONJUNCTION WITH PRIVATE LINE SERVICE CALLS.

- CALL FORWARD - CALL PICK-UP - HOLD - SPEED CALLING - 3-WAY CONFERENCE

THE DIALLING FOLLOWING THE SELECTION OF A PRIVATE LINE DIRECTORY NUMBER WILL BE IN ACCORDANCE WITH THE RULES OF THE SERVICE REPRESENTED BY THE PRIVATE LINE.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	STATION TO STATION CALLING
Feature no	F0407

DESCRIPTION

This feature permits IBN customer group stations to complete calls to other stations within the same customer group, without the assistance of an attendant, by dialing a 2, 3, 4, 5, 6 or 7 digit number.

Feature Restrictions

1. The number of digits dialed for intra-group calling must be the same for all stations.
2. Station to station calling between different customer groups is not permitted.
3. This feature specifically excludes Hotel and Airport requirements. The following highlights reasons for exclusion. Hotel room to room dialing can involve non leftwise unique dialing e.g. room 1, room 10, etc. or, if leftwise unique because of an access code (typically "7"), the room number dialed is variable. Airport Centrex involves a limited amount of inter customer group station to station dialing.
4. This feature does not apply to lines assigned Automatic Line, Manual Line, Denied Origination.

Feature Requirements

1. Upon reporting an off-hook, CC (Central Control) gives the LM (Line Module) the following parameters:
 - DOD (Direct Out Dialing) access digit
 - Attendant access digit
 - Other access code digit(s)
 - The number of digit to collect for other than the above before sending a digits message.

2. The number of digits dialed for station to station calls is stored at the customer group level. Station-to-station calling can require (will for Kodak) both thousands and hundreds digit translation.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	TANDEM SWITCHING OF SPECIAL SERVICE CIRCUITS
Feature no	F0408

DESCRIPTION

THIS FEATURE ALLOWS TANDEM CONNECTION OF SPECIAL SERVICE CIRCUITS DEDICATED TO A CUSTOMER GROUP. SUCH TRUNK-TO-TRUNK CONNECTIONS WILL BE CONTROLLED BY THE CLASS OF SERVICE RESTRICTIONS OF THE TRUNK GROUPS INVOLVED. AN INCOMING 'FOREIGN EXCHANGE' CALL, IF TRANSFERRED, MAY TANDEM TO AN INTEROFFICE OUTGOING TRUNK CIRCUIT. AN FX CALL MAY ALSO TANDEM TO AN INCOMING OR OUTGOING TIE TRUNK CIRCUIT.

A CALLING PARTY MAY TANDEM FROM AN INCOMING TIE TRUNK CIRCUIT TO AN OUTGOING TIE TRUNK CIRCUIT, OR OUTGOING EXCHANGE NETWORK TRUNK.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	LOUD SPEAKER & RADIO PAGING ACCESS
Feature no	F0409

DESCRIPTION

1. LOUD SPEAKER

IT PERMITS ATTENDANTS AND STATION USERS TO HAVE ACCESS TO LOUD- SPEAKER PAGING EQUIPMENT.

ACCESS TO LOUDSPEAKER PAGING IS SUBJECT TO ORIGINATING CLASS OF SERVICE RESTRICTIONS.

ACCESS IS PROVIDED FOR THE FOLLOWING PAGING SYSTEM CONFIGURATION.

1- SINGLE PAGING SYSTEM/SINGLE ZONE

2- SINGLE PAGING SYSTEM/MULTIPLE ZONE

3- MULTIPLE PAGING SYSTEMS/SINGLE ZONE PER SYSTEM

CONFIGURATIONS 1 AND 3 ARE ACCESSED BY DIALLING AN APPROPRIATE ACCESS CODE. CONFIGURATION 2 REQUIRES AN ACCESS CODE PLUS A ZONE NUMBER.

THIS FEATURE ALSO PROVIDES AN OPTIONAL PRE-EMPT CAPABILITY FOR THE ATTENDANT. 2. RADIO PAGING

THIS FEATURE PERMITS SELECTED STATION USERS AND ATTENDANTS TO ACCESS CUSTOMER-PROVIDED RADIO PAGING EQUIPMENT IN ORDER TO SUMMON A PARTICULAR PERSON BY ACTIVATING A POCKET PAGING DEVICE.

ACCESS TO THE RADIO PAGING SYSTEM IS ACCOMPLISHED BY DIALLING A RADIO PAGE ACCESS CODE (E.G., 1XX) FOLLOWED BY THE PAGE CODE ASSIGNED TO THE PERSON BEING PAGED. THE INDIVIDUAL PAGE CODE IS OUTPULSED OVER A RADIO PAGING ACCESS TRUNK TO THE RADIO PAGING EQUIPMENT. THE PAGING EQUIPMENT THEN GENERATES AN RF SIGNAL WHICH TRIGGERS AN AUDIBLE TONE AT A PARTICULAR POCKET PAGE DEVICE. THE PAGED PARTY MAY ANSWER FROM ANY INTRA-GROUP STATION BY DIALLING THE PAGE OPERATOR'S STATION NUMBER.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	STATION FEATURES		
Feature	CALL FORWARD	ALL CALLS	
Feature no	F0410		

DESCRIPTION

IBN Call Forwarding (CFX) allows a customer to have incoming calls to a station automatically forwarded to a predetermined telephone number. The station corresponding to the dialed number will be referred to as the base station; the number to which calls are forwarded will be referred to as the remote station.

CFI will consist of the following variants:

1. Call Forwarding Universal (CFU). This will permit stations to forward calls to user defined locations inside and outside the customer group, including the attendant. If the station is assigned CFU, the CFI feature is included.
2. Call Forwarding Intragroup (CFI). This will permit stations to forward calls only to customer defined locations within the customer group. This is done by setting an Intragroup flag for the appropriate routes.
3. Call Forward Busy (CFB) - Reference F0411.
4. Call Forward Don't Answer (CFD) - Reference F0412.

The features described here are CFU and CFI.

The remote station to which calls are forwarded may also have activated call forwarding. In this case the forwarded call may again be forwarded to the next remote station. Within DMS-100, up to 5 call forwards will be permitted. If the 6th station has activated call forwarding the caller will hear busy tone.

If 2 or more users set up a call forwarding loop e.g. A to B, B to C and C to A or B, then any call coming into the loop will receive busy tone.

Only one call will be forwarded at a time. If a call has already been forwarded and another call arrives, the caller will receive busy tone.

Originators of incoming calls which are forwarded will be unaware that call forwarding is in effect.

When call forwarding is active the base station's ability to originate calls will be unaffected. This includes the ability to pick up calls.

Call forwarding will be implemented ONLY in a senderized environment. Pause insertion (3) will not apply.

Restrictions

These features cannot be assigned to automatic lines, manual lines, lines denied termination, denied origination, suspended lines.

If the base station has activated call forwarding to service codes (N11), operators (555-1212, etc.), test lines or similar facilities, such calls will not be forwarded but will be given blank DN treatment.

If the base station has activated call forwarding to himself, the caller will hear busy tone.

Station restrictions applicable to the remote station will still apply. For example, if the remote station is restricted from receiving DID calls, such a call will not be forwarded and the caller will receive busy tone.

Recording of Feature Activation & Deactivation

All call forwarding activation and deactivation will be recorded in the unlikely event that an office reload is required. Each time an activation or deactivation is completed, DMS will attempt to record the change in the Journal File. If the Journal File is not available, a log message will be written to the system hard copy terminal.

CFU Feature Operation While Feature is Active

If CFU has been activated to a DOD number a 500 msec ring splash will be applied to the base station (if idle) each time a call is forwarded. The call cannot be answered by the base station. Ring splash serves as a reminder that calls are being forwarded outside the customer group. If the base station goes off-hook at any time, it will receive dial tone.

Ring splash does not apply to calls forwarded within the customer group.

If the base station number is dialed from the base station while CFU or CFI is active, the call will be forwarded to the remote station.

Charging

When call forwarding is active, appropriate SMDR entries will be made for any calls which are forwarded. Reference the SMDR feature.

Feature Assignment and Deletion

CFU and CFI can be assigned to and deleted from lines via the Service Order System.

CFU and CFI Activation by 500 and 2500 Sets

To activate the feature, the base station goes off-hook and dials the activation code assigned to call forwarding. The station will receive special dial tone. The station then enters the number to which calls are to be forwarded. This can be from:

- 1 to 18 digits if station has CFU feature
- 1 to 7 digits if station has CFI feature

DMS will then return confirmation tone to inform the user that the call forwarding number has been stored as dialed.

The activation code dialed to activate call forwarding will be the same for CFU and CFI. This can be any 2 or 3 digit code (typically 1XX) or it can be a function code (³ plus 2 digits - reference F0416).

While call forwarding is active, if the base station dials:

- the activation code, the base station will hear reorder tone. Therefore, the base station can check the station of call forwarding.
- the base station DN, the base station will be forwarded. This is a further check.

To change the call forwarding DN, the base station must first deactivate call forwarding.

A further feature Call Forwarding Validation can be used to automatically validate the directory number entered as the Forward-to DN (reference F2549).

CFU and CFI Deactivation by 500 and 2500 Sets

To deactivate call forwarding, the base station will dial the deactivation code. The deactivation code will be the same for CFU and CFI. This can be 2 or 3 digit code (typically 1XX) or it can be a function code { plus 2 digits - reference F0416). Confirmation tone will be returned regardless of whether CFU/CFI is active.

CFU and CFI can also be deactivated from the maintenance position via table control.

Feature Interaction

If the base station also as Call Waiting, Call Waiting is disabled for the duration that call forwarding is active. The same applies to Attendant Camp-on.

Call forwarding to the attendant is deactivated while Night Service is active. While deactivated, calls to the base station will cause that station to be rung until the call is answered, abandoned or upon ringing timeout. When day time service is restored, call forwarding to the attendant will again apply.

CFU or CFI may be assigned to hunting DN and when active will take precedence over hunting.

The remote station number for CFU or CFI may be a hunt group.

Speed Calling can be used to enter the remote number to activate call forwarding.

Call Forwarding Specific to Kodak

In part II of the Kodak Spec (see references below), call forwarding is shown as permitted to other stations and to trunk groups 48 (bldg 12), 36A (#1ESS, local tandem access), 41 (bldg 26) and 55 (bldg 313). CFU will NOT be required for forwarding via trunk group 36A if the intragroup flag is set against the route.

Capacity

A station can enter from 1 to 7 digits if assigned CFI and from 1 to 18 digits if assigned CFU as call forwarding numbers.

A maximum of 32,000 lines per DMS-100 can be assigned CFX e.g. all variations of call forwarding.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	STATION FEATURES		
Feature	CALL FORWARD	BUSY	
Feature no	F0411		

DESCRIPTION

Call Forward Busy (CFB)

When the called station is busy all calls will be forwarded to a predefined station within the customer group.

An option (CBI) is available on this feature to prevent forwarding of intragroup calls. In certain applications where a high proportion of the incoming calls are of intragroup origin, installation of this option will prevent the remote station being flooded with intragroup calls. This is especially relevant if several stations have CFB/CFD to the attendant or to the same secretary. Reference F0412 for CFD.

An option (CBE) is available on this feature to prevent forwarding of external calls (outside the customer group).

Operation of CFB

Calls are not forwarded in the following cases:

1. Call is of intragroup origin and the base station has CBI option.
2. Remote station is attendant and night service is in effect.
3. Forward number is not an intragroup call.

For any of the above, the caller will hear busy tone.

Calls are forwarded if forward number is intragroup and:

1. Number routes to intragroup tie trunk or other intragroup route.
2. Number is to hunt group.
3. Number is to station which does not have DTM, DOR, SUS or PLP options.

Feature Assignment and Deletion

CFB will be assigned to a line via the service order system. The remote DN must also be assigned. The remote DN cannot be changed by the base station. Also included will be whether option CBI is to be applied.

If the base station also has the CFD feature (reference F0411), the remote DN for both CFB and CFD must be the same.

CFB is deleted from a line via a service order. The remote DN can be changed via the service order system for the line.

Feature Interaction

Call Waiting and CFB and incompatible features. One or the other, but not both, can be assigned to the same line.

If the base station activates CFU or CFI (reference F0410), CFU or CFI takes precedence.

If the remote base station activates CFU, the call will not be forwarded. CFB calls must stay within the customer group.

Note that calls can still fall "off the edge" since the DMS-100 feature will permit CFB to intragroup DN which are served by other PBX. Therefore, the caller is subjected to whatever features the remote PBX does/does not support. This is within design intent.

CFB cannot be assigned to hunt groups.

When night service is active, CFB to the attendant is deactivated. It is reactivated when daytime service is restored.

Attendant camp-on and CFB are compatible features as follows:

- If the attendant extends a call to a busy station, camp-on will apply. If a call is already camped on, the attendant will hear reorder tone. The CFB feature will not apply. Camped on calls are subject to Automatic Recall.
- If the attendant originates a call to a busy station, CFB will apply except where the forward DN is back to the attendant. Camp-on does not apply to attendant originated calls.

A maximum of 5 forward loops are supported within DMS, after which the caller will hear busy tone.

If a closed loop is detected, A to B to C to A or B, DMS will return busy tone. The call will not be forwarded from C to A or B.

Incoming callers will not be aware of CFB within DMS-100. This does not apply if the CFB DN is served by another PBX.

Timers do not apply to the CFB feature.

Capacities

The CFB DN can be from 1 to 7 digits.

A maximum of 32,000 lines can be assigned call forwarding. This includes all feature variants - CFU, CFI, CFD and CFB. Reference F0410 and F0411.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	STATION FEATURES		
Feature	CALL FORWARD	NO ANSWER	
Feature no	F0412		

DESCRIPTION

If the called station does not answer within a prescribed time, the incoming call is automatically routed to another designated station or to the attendant. The answer timeout interval is a customer group parameter (same timer value as don't answer and call waiting recall to attendant).

The remote station must be within the customer group or the attendant.

Three options will be available with this feature:

1. N:

If the base station does not answer within the prescribed time, the call will be forwarded to the remote station. This option includes all calls (incoming DID, EPSCS, tie trunk, intra group calls, etc.).

2. CDI:

This is an option available on CFD which will prevent the forwarding of intragroup calls. In certain applications where a high proportion of the incoming calls are of intragroup origin, installation of this option will prevent the remote station from being flooded with intragroup calls. This may be especially relevant if several stations have CFB/CFD to the attendant or to the same secretary (reference F0412 for CFB).

3. CDE:

This is an option available on CFD which will prevent the forwarding of external calls (outside the customer group).

CFD Feature Operation

Calls are not forwarded in the following cases:

1. Call is of intragroup origin and the base station has CDI option.
2. Remote station is attendant and night service is in effect.

3. If the forward number is not an intragroup number (remote station has activated call forwarding outside the group or features LOD or LOR would result in forwarding outside the group).

Calls are forwarded if forward number is intragroup and:

1. Number routes to intragroup tie trunk or other intragroup route.
2. Number is to hunt group.
3. Number is to station which does not have DTM, DOR, SUS or PLP options (see below), and;
4. Remote station is idle. If remote station also has CFD or CDI it will be rung for the answer timeout interval before being forwarded again subject to the same restrictions.
5. Remote station is busy and:
 - (a) has call waiting and a call is not already waiting
 - (b) has call forward busy

Feature Assignment and Deletion

CFD is assigned to a line via the Service Order System. Also included will be whether CDI is to be applied. The directory number of the remote station must also be input. This number can only be changed via a service order, not by the base station. CFD is deleted from a line via the Service Order System.

Feature Interaction

If a line is assigned both CFD and CFB (reference F0412), the remote DN must be the same for both features.

If CFU or CFI (reference F0410) is active, it will take precedence over any other CFX variants assigned to the base station. If a CFD call is to be forwarded to a remote station and the remote station has activated call forwarding outside the customer group, the call will not be forwarded but will continue to ring on the base station. CFD calls must stay within the defined customer group.

Note that the remote station can be served by another PBX, the only criterion being that the outgoing route be intragroup. Therefore the call,

once forwarded outside DMS, will be subject to whatever features that PBX supported. Therefore, calls can still "fall off the edge".

This feature is apply to attendant originated calls except where the forward DN is to the attendant. This feature will not apply to attendant extended calls. Attendant extended calls are subject to Automatic Attendant Recall - reference F0371.

A call to a busy station with Call Waiting will be call waited. CFD does not apply to busy lines.

A maximum of 5 call forwards within DMS-100 will be permitted. The call will continue to ring the 5th station.

CFD cannot be assigned to hunt groups.

CFD is subject to class of service restrictions - reference V0415. If the remote station is not permitted to receive the type of call to be forwarded, the call will ring the base station until abandoned or answered.

CFD to the attendant will only apply to daytime service. At night the call will continue to ring the base station.

Assignment of an ICI to CFD on the console will not be a condition for forwarding such calls to the attendant.

If a closed loop is detected (A to B to C to A or B), the call will continue to ring on C. It will not be forwarded to A or B.

Only one call will be forwarded at a time. If a call has already been forwarded, a new call will ring the base station until answered or abandoned.

Capacities

The DN input for CFD can be from 1 to 7 digits in length.

A maximum of 32,000 lines can be assigned call forwarding. This includes all varieties of call forwarding (reference F0410 and F0412).

Abbreviations

LOD = Line Overflow to DN
LOR = Line Overflow to Route
DTM = Denied Termination
DOR = Denied Origination
SUS = Suspended

LPL = Plug Up (also called trouble intercept)
DN = Directory Number

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	CALL PICKUP
Feature no	F0413

DESCRIPTION

Call Pickup permits a station to answer calls incoming to another station within a preset pickup group. Call Pickup is provided on an individual station basis within an IBN customer group. To pickup a call, the station user dials the code assigned to the feature.

Feature Restrictions

When a station is busy on a call, the station must terminate the call to pickup a call within the group. Flashing and dialing the pickup code is not permitted. If a station attempts this, reorder tone will be heard.

Waiting calls cannot be picked up by the Call Pickup feature. Camped-On calls cannot be picked up.

The ability of a station to pickup a particular call is not subject to the station's line restrictions. It is up to the customer to arrange call pickup groups in a suitable manner and that stations have the same attributes. In the event that there are several incoming calls to a group and a station dials the pickup code, the order of pickup is dependent on the linking of DN in the pickup group e.g. it is circular.

A station can only pickup calls within the defined Call Pickup Group.

Feature Use

When a station dials the pickup code to answer another station's incoming call, an immediate connection is made between the pickup station and the incoming call. No warning tone or other tone is provided.

The pickup code can be any two or three digits. The first digit cannot be the same as a single digit access code which requires the return of second dial tone. Usually a 1XX code is assigned.

It can also be a ³YX code where Y is dependent on Speed Calling Long list assignment - Reference F0416.

Speed Calling can be used to dial the pickup code.

Call Pickup Line Assignment

The Call Pickup feature and the Call Pickup group to which the station belongs are assigned to a line via the Service Order System.

If a line is to be assigned this feature, CPU is input together with the DN corresponding to the pickup group. (This serves as a backward pointer).

With this design, there is no limit on the number of pickup groups DMS can support.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	3-WAY CONFERENCE/TRANSFER
Feature no	F0414

DESCRIPTION

There are three types of call transfer available to IBN users. These are:

- CT INC - Call Transfer of Incoming Calls
- CT OUT - Call Transfer of Outgoing Calls
- CT ALL - Call Transfer of All Calls

Included in these features are:

- Consultation Hold

This permits the transferring party to talk privately with the destination before transferring the call.

- Add-On.

This permits the transferring party to establish a 3 way call prior to transferring the call.

Each of these features allows the station user, without the assistance of the attendant, to establish a 3 way call and transfer a call. The Call Transfer feature requires the use of the 3 port conference circuit.

CT INC, CT OUT or CT ALL must be assigned on a CUSTOMER GROUP basis. When assigned to a customer group, individual station restrictions will still apply. Three way calling is assigned on a per line basis. When assigned, station restrictions still apply.

Call transfer is denied if an attempt is made to connect 2 trunks without disconnect supervision. Consultation occurs once only. This feature does not include consultation flip-flop.

Enhancements have been developed for Call Forwarding. Refer to Call Forward Enhancements feature in NTX413AA package.

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
 Feature set STATION FEATURES
 Feature SPEED CALLING INDIVIDUAL-SHORT LIS
 Feature no F0416

DESCRIPTION

The Speed Calling feature permits a customer to place calls to a previously designated list of frequently called numbers by dialing a speed calling code (1 or 2 digits) instead of the complete number.

There are basically 2 lists; a short list (SCS) and a long list (SCL).

The short list can consist of a maximum of 10 stored numbers. The Speed Calling codes to be assigned to stored numbers can be from 0 to 9.

The long list can consist of a maximum of 70 stored numbers. The long list can consist of 30, 50 or 70 numbrs. The Speed Calling codes to be assigned to stored numbers can range from 00 to 69 but must not conflict with codes used for other features. This is discussed in detail later.

The Speed Calling short list will be limited to Speed Calling Individual.

The Speed Calling long list can belong to an individual line in which case it can only be updated, deleted from and used by this line. It can also be accessed by a number of users in which case it becomes a Group Speed Calling list - Reference V0459 "Speed Calling Group". However, only one line, called the controller, can change the contents of this list.

To add a number to a Speed Calling list, the station goes off-hook and receives regular dial tone. Dialing and DMS-100 response are illustrated below.

TYPE OF NUMBER	SHORT LIST PROGRAMMING	
-----	-----	-----
TO BE STORED	IF DIGITONE	IF DIAL PULSE
-----	-----	-----
STATION NUMBER	³ 7SDT+0+23456#+CT	374TOSDT+0+23456TO+CT
LOCAL CO	³ 744SDT+1+9+7D#+#CT	374TOSDT+1+9+7DTO+CT
DDD	³ 74SDT+2+9+1+7/10D#+CT	374TOSDT+2+9+7/10DTO+CT

IDDD	³ 74SDT+3+9+011+7TO12D!# +CT	374TOSDT+3+9+011+7TO10DTO+CT
LOCAL TANDEM		³ 74SDT+4+1+5D#+CT
	374TOSDT+4+1+5DTO+CT	
EPSCS	³ 74SDT+5+28+7/10D#+CT	374TOSDT+5+28+7/10DTO+CT
PAGING	³ 74SDT+6+7392XXX#+CT	374TOSDT+6+7392XXXTO+CT
TANDEM TIE TRUNK	³ 74SDT+7+8 ³ +144 ³ +85 ³ +830 ³ +4D ³ +CT	Pause insertion not possible
	(Cut thru dialing)	
ACCOUNT CODE		³ 74SDT+8 ³ +13456#+CT Not Possible

Legend_for_Short_List_Programming

1. Leading character ³ and digit 3 (DP) serve as control
2. 74 is Speed Calling Short List code.
3. SDT = Special Dial Tone
4. TO = Time Out (short timing required - same as POTS feature).
5. First digit following SDT is digit being assigned to number to be stored. This digit can be from 0 to 9. Therefore, the short list can be 10 numbers long for IBN.
6. # = octothorpe key on DTMF set. If not used, timeout applies. Timeout always applies to DP sets.
7. CT = Confirmation Tone
8. Tandem Tie Trunk example is not applicable to Kodak. Cut through dialing will not be available for Kodak K and IS. This type of programming is included for IBN designer information ONLY.
9. Account Code example is not applicable to Kodak.

Notes Associated With Short List Programming

Asterisk (³) as a leading control character indicates that a feature is being accessed, either for use or for programming.

In the above example, digit 3 is used in lieu of ³ by DP sets. Note that any digit can be used IF second dial tone is not to be returned following the digit. This makes digits 9 and 0 ineligible in most instances.

The number used instead of ³ need not be a single digit. It can be any number of digits in length. For user convenience, it is recommended that it be limited to 1 or 2 digits where possible. The combination of digits must be unique.

DTMF sets users will normally use ³ as a leading control character, however, the digit(s) assigned to this character can also be keyed by DTMF sets and will be accepted.

In the above example 74 is the two digit code assigned to Speed Calling Short List. It can be any code from 00 to 99 that is not assigned to another feature or as a Long List stored code.

In the above, second dial tone is NOT returned following digit 9 for the local CO; DDD and IDDD examples, digit 1 for Local Tandem access, digits 28 for EPSCS access. When cut through dialing is developed, dial tone will not be returned following digits 8, 144, 85, 830 in the above example.

In the above, #, if input, is used to identify the end of number programming. # will not be stored. If # is not input, a timeout will apply. ³ as the last character will permit the station, at Speed Calling use time, to key more digits manually. Since a maximum of 24 digits, including pauses can be stored, this will permit a station to store partial numbers, where required.

To store a number which is NOT to be outputted e.g. an Account Code, the number to be stored must be preceded by ³.

Long List programming is the same as short list programming, with the following exceptions:

- A different access code must be assigned to Speed Calling Long List. It will also be in the range of 00 to 99 and can be any number which is not assigned to another feature.
- Two digits are input following special dial tone for the number to be stored. These two digits can range from 00 to 29, 00 to 49 or 00 to 69 if the Speed Calling Long List consists of 30, 50 or 70 numbers respectively.

Changes to Speed Calling lists are achieved by overwriting an existing number.

To delete a number from a list, the station goes off-hook, receives dial tone and dials ³ followed by the code assigned to the list to be updated e.g. 75. The station follows this with #, otherwise a timeout will ap-

ply. (See note below) Special dial tone is returned. The station then dials the Speed Calling code assigned to the number to be deleted and follows this with #, otherwise a timeout will apply. DMS then returns Confirmation Tone. For DP stations, number deletion will be the same except that the number(s) assigned to function as³ (e.g. digit 3) must be dialed - e.g. 375. Timeouts will always apply to DP sets. Note that Digitone stations can also use the DP set method.

To use Speed Calling, the station will go off-hook and receive regular dial tone. The station then dials³ (or digit assigned to this function) followed by the single or 2 digit code assigned to the stored number. If # is not input following this, a timeout will apply.

Note: Depending on feature implementation, a timeout might not be used following e.g. ³ 75. A timeout will be required for 375 if 3 is also the leading digit for a station number. Note: 375 cannot also be a station number.

Feature Restrictions and Feature Interaction

Octothorpe (#) is used to indicate the end of number; it cannot be stored.

Numbers stored can consist of from 1 to 24 digits including asterisks. If a station attempts to store more than 24 digits, reorder tone instead of confirmation tone will be heard.

A speed calling list cannot be updated while the line is busy on another call, e.g. place a call, receive answer, flash, obtain special dial tone and add to or update the Speed Calling list.

Unlike the POTS feature, stored numbers will only be validated when the feature is used.

Confirmation tone is always returned when a station attempts to delete a stored number regardless of whether the single or 2 digit code had a number assigned to it.

Call Forwarding can be activated to a number contained in the Speed Calling list if the station has both features e.g. 72# (or timeout) + Special Dial Tone + ³0# (or it's DP equivalent followed by a timeout). This activates Call Forwarding to the number stored against speed call code 0. Reference also "Functions of 00 through 99".

When using Speed Calling, the user can input more digits by regular dialing PROVIDED that the last digit of the stored number is³. Therefore, this capability is restricted to Digitone stations except where a DP station is a user of a Group Speed Calling list and the controller is a Digitone station.

Account Codes can be stored in a Speed Calling list provided that the number is preceded by ³. (Reference Speed Calling programming example) Again, this capability is limited to Digitone sets. Account Code length checks are only made at the time the feature is used.

An Authorization Code can be stored in a Speed Calling list by preceding it with a ³, although this is not recommended for security purposes.

Where DMS serves as a PBX and senderized operation is not used (e.g. cut through dialing is applicable), ³ must be stored following the CO or tie trunk access code for 3 second pause insertion. Again, this is only possible from Digitone sets. Pause insertion is also applicable where DMS is a class 5, the number is to be outpulsed over dial repeating tie trunks and cut through dialing is applicable.

Speed Calling can be used to establish a 3 way call and to transfer a call.

DMS responses to invalid programming and use will be the same as for POTS Speed Calling and are defined in DID V0067 "Speed Calling - Long & Short Lists" by B. Devlin, with one exception - numbers are not validated at programming time.

A station can have both 1 Speed Calling short list and 1 Speed Calling long list.

For Speed Calling Individual, station restrictions still apply. If a toll restricted station has stored a toll number in the Speed Calling list (permitted since numbers are not validated at programming time), and then uses Speed Calling to place the toll call, the call will be intercepted.

Where a station has stored a partial number (reference programming notes), and then uses it, the following will apply at feature use time:

- If the stored number is a partial intra office number, DMS will insert the partial number into a digit register and expect more digits.
- If the stored number is for an outgoing route, DMS will translate, obtain a route result, make a connection to a trunk, outpulse the appropriate digits and wait for more digits. These will be outpulsed.
- If cut through dialing applies, DMS will cut through after outpulsing to allow the user to hear distant end tone. DMS will outpulse any digits the station then dials. DMS will not validate these digits. Therefore a toll restricted station can "beat the system" by storing e.g.

8+³+144+³+85+³+830+³ and then dialing 9

followed by a toll number. This also applies to regular dialing where cut-through is applicable.

For Speed Calling Long Lists, the code dialed must be a 2 digit code e.g. number is stored against Speed Calling code 05. 05 must be dialed, not just 5. This permits a station to have both a short and long list.

Speed Calling Assignment

Speed Calling is assigned to lines via the Service Order System. The short list mnemonic is SCS. The long list mnemonic is SCL but requires supplementary data e.g. 30 if 30 numbers long, 50 or 70 if 50 or 70 numbers long respectively.

Functions of 00 Through 99

These numbers are accessed by dialing³ (or it's DP equivalent) and can be assigned to Speed Calling, Call Forwarding, Call Pickup, etc.

The Speed Calling long list's length is arbitrarily limited to 70 numbers. This maximum length is not achievable if more than 30 features are accessed by dialing³XX. The short list is not affected.

Under "Feature Restrictions and Feature Interaction, an example of Call Forwarding activation was given. This example can also be³ 72#+Special Dial Tone +³0# to activate Call Forwarding (72) to the number stored against speed call code 0.

Translation Requirement

An additional check is required when the feature is used to possibly avoid an endless loop e.g. station dials³ 25. The number stored against 25 is 25.

Capacity

The number of speed call lists available per office and used by both IBN station sets and attendant consoles is 16384 for short lists, 8192 for long lists of 30 numbers, 4096 for long lists of 50 numbers and 4096 for long lists of 70 numbers.

All lists will accommodate 12 digit stored numbers. Shared store (a pool of resources) is used for numbers from 13 to 24 digits in length.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	STATION FEATURES		
Feature	SPEED CALLING	INDIVIDUAL-LONG LIST	
Feature no	F0417		

SEE FEATURE NUMBER F0416

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	STATION FEATURES		
Feature	SPEED CALLING	GROUP-LONG LIST	
Feature no	F0419		

DESCRIPTION

One line is designated controller of a Speed Calling list. Only this line can add to, change or delete numbers from the list. This line can also use the list.

The other lines are designated as being:

- Members of a particular Speed Calling Group
- Speed Calling Users only

A Speed Calling User can only use the Speed Calling feature. A user cannot affect the contents of a list.

There can be a number of Speed Calling groups within a customer group. The number of lines which form the Speed Calling Group can range from 2 (1 controller plus 1 user) to all liners within a customer group.

A user of group Speed Calling can be restricted from toll numbers in a Speed Calling list. Restriction from toll speed calling numbers is independent of the station's toll restrictions e.g. a station may be toll denied by regular dialing but can have access to toll numbers in a Speed Calling list.

Assignment of Group Speed Calling

The controller is assigned the Speed Calling feature as described in F0416. A controller can be any station assigned a Speed Calling Long List.

Users are designated as such via the Service Order System by specifying feature SCU. The user is assigned to a particular Speed Calling Group by specifying the LEN of the controlling line (CONTLEN).

An additional flag is required in the user extension block. Its purpose will be to specify whether the user has access to toll numbers contained in the Controller's Speed Calling list, regardless of the user's station restrictions, code restrictions, etc.

Feature Use

To use the feature, the Speed Calling User (SCU) goes off-hook and receives regular dial tone. The User now dials:

if a digitone set user: ³ YX
if a DP set user: ZYX timeout

- where ³ is the leading control character to indicate a feature is being accessed and YX defines the feature.
- Y can be any digit from 0 to 6 and X can be any digit from 0 through 9. This assumes that the Speed Calling Controller has a 70 number long list - see also Feature Restrictions and Interaction below.
- Z is the digit or digits used by DP stations in lieu of leading control character ³. DTMF station users can use either ³ or Z as leading control characters.
- A timeout is required for DP stations since ZYX may be ambiguous.

Feature Restrictions and Feature Interaction

Group Speed Calling is limited to long lists.

A Speed Calling User can only have access to 1 Speed Calling long list. If the controller has both a long and a short list, a User, by definition, will only have access to the long list.

If the toll number access flag is set, the User will have access to all toll numbers in the Controller's Speed Calling list. If this flag is not set, the User will be denied access to all toll numbers in the list and given reorder tone (same a Speed Calling Individual where the station dials a Speed Calling code for which a number has not been stored).

For other than toll numbers, the User's regular restrictions will apply, that is, if the User is not permitted access to a destination by dialing the complete number, the User is also not permitted access via Group Speed Calling (reference F0388 etc.).

If the controller has stored Account Codes for an Authorization Code in Speed Calling list, the User will also have access to these numbers (reference V0458).

If the User has Call Forwarding, the User can activate Call Forwarding by using Speed Calling (reference F0416 for an example).

The User can use Speed Calling to establish a 3 way call and transfer a call.

If the controller has stored a partial number and followed it with³ (reference F0416), the User can also manually dial or key additional digits.

A User can have it's own Speed Calling Short List.

The attendant can be the controller of a Speed Calling Long list (reference F0370 "Attendant Speed Calling").

No checks will be made to prevent a user from attempting to use a Group Speed Calling list while a Controller is updating the list. The number may or may not be valid.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT CONSOLE DISPLAY
Feature no	F0438

FEATURE SYNOPSIS

This feature will allow use of the display control key on the key lamp display unit to:

1. provide additional call information to the attendant by displaying the last 16 alpha numeric character of the 32 characters available.
2. cycle through the chain of parties in the held loop re-entry phase of a conference call.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	CALL WAITING
Feature no	F0451

DESCRIPTION

AN INCOMING CALL ENCOUNTERING A BUSY STATION RECEIVES AUDIBLE RINGING WHILE THE CALLED STATION USER RECEIVES CALL WAITING TONE. THE CALLED STATION USER CAN CHOOSE TO ACKNOWLEDGE THE NEW CALLER AND PLACE THE EXISTING PARTY ON HOLD, TO ALTERNATE BETWEEN THE CALLERS OR TO ABANDON ONE OF THE CALLS.

A WAITING CALL IF UNANSWERED WITHIN 30 SECONDS IS AUTOMATICALLY ROUTED TO THE ATTENDANT. OPERATION -----

A HAS CALL WAITING AND IS TALKING TO B. C CALLS A. A WILL HEAR CALL WAITING TONE AND C WILL BE CALL WAITED FOR A. C CONTINUES TO HEAR AUDIBLE RINGBACK TONE.

TO TALK TO C, A WILL FLASH THE SWITCHHOOK. THIS WILL CONNECT A TO C AND PLACE B ON HOLD. WHILE ON HOLD, B WILL HEAR NOTHING. TO RETURN TO B, A WILL AGAIN FLASH. THIS WILL PUT C ON HOLD. A CAN ALTERNATE BETWEEN B AND C BY SWITCHHOOK FLASHING.

A CAN ABANDON BY GOING ON-HOOK FOR A DURATION GREATER THAN THE FLASH INTERVAL. THIS WILL CAUSE THE HELD PARTY TO RING A'S SET.

IF EITHER B OR C ABANDONS WHILE HELD, A NEW CALL DIRECTED TO A WILL RECEIVE CALL WAITING TREATMENT. A CAN ALSO IGNORE THE WAITING CALL. A WILL HEAR A SECOND SPURT OF CALL WAITING 10 SECONDS AFTER THE FIRST CALL WAITING TONE. THROUGHOUT, C WILL HEAR AUDIBLE RINGBACK TONE.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	UNIFORM NUMBERING PLAN CAPABILITY
Feature no	F0761

FEATURE SYNOPSIS

This feature enables easier dialing between any two Business Service stations of the same customer.

Each customer group is assigned a destination code. A station dials the destination code and the extension of the called party. No routing digits are required from the handset. The routing of the call, application of alternate routing and/or queuing is handled by the machine according to the class of service or authorization code assigned to the calling party.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)	
Feature set	ATTENDANT FEATURES	
Feature	BUSY VERIFICATION	-TRUNKS
Feature no	F0771	

DESCRIPTION

THIS FEATURE ALLOWS THE ATTENDANT TO ESTABLISH A TALKING CONNECTION WITH ANY APPARENTLY BUSY TRUNK OR SPECIAL SERVICE ACCESS LINE TO VERIFY THAT THE TRUNK IS BUSY AND IN WORKING ORDER.

FOR THE PURPOSES OF THIS DID, THE TERMS "TRUNK" AND "SPECIAL SERVICE ACCESS LINES" DO NOT INCLUDE TRUNKS DEDICATED TO PAING, CODE CALLING, DICTATION, ETC. BUSY VERIFICATION WILL ONLY BE PERMITTED ON C.O. TRUNKS, TIE TRUNKS, FX TRUNKS, OUTWATS TRUNKS.

FOR KODAK AND OTHER PBX APPLICATIONS, THIS FEATURE WILL APPLY TO ALL ONE WAY OUTGOING AND TWO WAY TRUNKS DIRECTLY TERMINATED ON DMS E.G. "DIAL 9" TRUNKS, SINCE THESE TRUNKS ARE FOR THE EXCLUSIVE USE OF THIS CUSTOMER. THIS IS UNLIKE THE IBN CASE, WHERE "DIAL 9" TRUNKS DO NOT BELONG TO A SPECIFIC IBN CUSTOMER GROUP.

THIS FEATURE CAN BE ASSIGNED ON A PER CONSOLE BASIS E.G. 1, SEVERAL OR ALL ATTENDANT CONSOLES CAN HAVE ONE OF THE FEATURE KEYS ASSIGNED TO BARGE-IN. OPTION BVT (BUSY VERIFICATION OF TRUNKS) MUST BE ASSIGNED FOR EACH CONSOLE WHICH IS TO HAVE THIS OPTION.

IF A CONSOLE DOES NOT HAVE A FEATURE KEY ASSIGNED TO BARGE-IN, THE ATTENDANT CANNOT BUSY VERIFY TRUNKS.

FEATURE USE _____

TO VERIFY A TRUNK, THE ATTENDANT DEPRESSES AN IDLE LOOP KEY FOLLOWED BY THE BARGE-IN KEY. THE CONSOLE LAMP STATES WILL BE:

- RLS LAMP OFF - SRC LAMP ON - BARGE-IN LAMP ON

THE ATTENDANT THEN KEYS:

TAC (CALLED NUMBER) # TMN #

WHERE TAC IS THE TRUNK ACCESS CODE OF THE TRUNK GROUP TO BE VERIFIED. CALLED NUMBER IS AN OPTIONALLY ENTERED NUMBER IN A DISTANT OFFICE. TMN IS A TRUNK MEMBER NUMBER, # IS OCTOTHORPE.

EXAMPLES ARE:

1 42239 # 3 #

1 # 3 #

NOTES PERTAINING TO EXAMPLES:

1. A TRUNK GROUP MUST HAVE A UNIQUE TRUNK ACCESS CODE IF IT'S TRUNKS ARE TO BE BUSY VERIFIED. THESE CODES MAY BE SET IN A PRETRANSLATOR FOR THE ATTENDANTS' USE ONLY.
2. IF A CALLED NUMBER IS NOT PROVIDED AND THE TRUNK IS IDLE, THE TRUNK WILL NOT BE RESERVED OR SEIZED FOR THE ATTENDANT'S USE. A MOMENTARY BURST OF TONE WILL BE HEARD BY THE ATTENDANT TO INDICATE THE TRUNK IS IDLE. THE BURST OF TONE WILL BE PROVIDED BY DMS-100, NOT THE FAR END OFFICE.

IF THE TRUNK IS BUSY, THE ATTENDANT WILL BE BRIDGED INTO THE CONNECTION BUT SHOULD NOT REQUEST THE PARTIES TO HANG UP.

THIS FORMAT IS USED FOR ATTENDANT TRUNK TESTING ONLY. IF ONE OF THE PARTIES DOES GO ON-HOOK WHILE THE ATTENDANT IS BRIDGED INTO THE CONNECTION, THE TRUNK WILL NOT BE SEIZED OR RESERVED FOR THE ATTENDANT.

3. IF A CALLED NUMBER IS PROVIDED, AN ATTEMPT WILL BE MADE TO PLACE THE CALL IN A NORMAL MANNER VIA ANY IDLE TRUNK. IF ALL TRUNKS ARE BUSY, DMS-100 WILL BARGE-IN ON THE SPECIFIED TRUNK MEMBER NUMBER. IF THE PARTIES GO ON-HOOK AT THE ATTENDANT'S REQUEST, THE TRUNK WILL BE RESERVED OR SEIZED AND THE CALLED DIGITS OUTPUTTED IN DP, DTMF OR MF.

IF THE TRUNK IS CALL PROCESSING BUSY AND THE CONNECTION DOES NOT INVOLVE AN IBN CUSTOMER GROUP STATION WITH NDC, THE ATTENDANT WILL BE BRIDGED INTO THE CONNECTION. IMMEDIATELY PRIOR TO BARGE-IN, BOTH PARTIES INVOLVED IN THE BUSY CONNECTION WILL HEAR BUSY VERIFICATION TONE.

THE ATTENDANT WILL HEAR BUSY TONE (60 IPM) IF ANY OF THE FOLLOWING OCCUR:

- A STATION WITH OPTION NDC IS INVOLVED IN THE CONNECTION - THE TRUNK IS MAINTENANCE BUSY - IF A DELOAD REQUEST HAS BEEN ISSUED FROM THE TTP FOR THAT SPE-

CIFIC TRUNK E.G. THE TRUNK IS AT PRESENT CALL PROCESSING BUSY. ON CALL COMPLETION, THE TRUNK WILL BE AVAILABLE TO MAINTENANCE AND NOT TO THE ATTENDANT - ANOTHER ATTENDANT IS VERIFYING THE TRUNK - THE TRUNK IS INVOLVED IN A 3 WAY CALL OR 6 PORT CONFERENCE CALL

THE ATTENDANT WILL HEAR REORDER TONE (120 IPM) IF ANY OF THE FOLLOWING OCCUR: - DMS IS OUTPUTTING ON THE TRUNK - THE ATTENDANT DIALS AN INVALID ACCESS CODE AND/OR MEMBER NUM-

BER - THE TRUNK IS A ONE WAY INCOMING TRUNK GROUP (SUCH TRUNKS CAN

BE TESTED FROM THE MAP) - A 3 PORT CONFERENCE CIRCUIT IS NOT AVAILABLE
- A NETWORK CONNECTION CANNOT BE MADE - A CONNECTION HAS JUST BEEN
MADE TO THE TRUNK, DMS IS WAITING
FOR A "PROCEED TO SEND SIGNAL" FROM THE DISTANT END E.G. THE
TRUNK MUST BE IN A STABLE STATE. STABLE MEANS IN THE TALK OR
IDLE STATE.

THE ATTENDANT CAN RELEASE FROM ANY OF THE PRECEDING BY DEPRESSING THE RLS
KEY. THIS WILL CAUSE THE RLS LAMP TO TURN ON AND THE SRC AND BARGE-IN
LAMPS TO TURN OFF.

IF THE TRUNK IS BUSY AND THE PARTIES INVOLVED IN THE BARGED-IN TRUNK
GO ON-HOOK, DMS MUST FIRST SEND ON-HOOK SUPERVISION TO THE DISTANT SWITCH
AND THEN SEIZE THE TRUNK (IF 2 WAY) OR RESERVE IT IF 1 WAY OUTGOING.
THIS ASSUMES THE ATTENDANT INPUT A CALLED NUMBER. IF A TWO WAY TRUNK,
GLARE MAY BE ENCOUNTERED. DMS WILL BACK OFF AND THE ATTENDANT WILL
HEAR REORDR TONE IF DMS IS THE OFFICE WHICH MUST YIELD.

FEATURE INTERACTION _____

WHEN BUSY VERIFYING A TRUNK AND THE TRUNK IS IDLE, THE BARGE-IN LAMP
WILL TURN OFF AND THE ATTENDANT WILL HEAR A MOMENTARY SPURT OF DIAL TONE.

IF, ON A BUSY CONNECTION, THE PARTIES INVOLVED IN THE BARGED-IN CON-
NECTION GO ON-HOOK, THE BARGE-IN LAMP WILL TURN OFF ONCE DMS HAS SENT
ON-HOOK SUPERVISION TO THE DISTANT END, THE TRUNK HAS BEEN SEIZED OR
RESERVED, AND IN THE CASE OF 2 WAY TRUNKS, GLARE DOES NOT OCCUR.

CALLS THE ATTENDANT HAS ON HOLD MAY BE BUSY VERIFIED.

BILLING CONTINUES WHILE A TRUNK IS BEING BUSY VERIFIED IF THE TRUNK IS
BUSY.

WHILE BUSY VERIFYING, ONLY THE NIGHT AND POSITION BUSY KEYS CAN BE DE-
PRESSED.

FEATURE RESTRICTIONS _____

THE ATTENDANT CANNOT BUSY VERIFY ONE WAY INCOMING TRUNKS. NOTE THAT ALL
TRUNKS CAN BE TESTED FROM THE MAP.

THE ATTENDANT CANNOT CONNECT ANOTHER PARTY TO A BUSY CONNECTION.

THE ATTENDANT CANNOT FORCE RELEASE A BUSY TRUNK. THE ATTENDANT CAN ONLY
REQUEST THAT THE PARTIES GO ON-HOOK.

ANY KEYING SEQUENCES OTHER THAN THOSE PREVIOUSLY DESCRIBED ARE INVALID.
THE BARGE-IN LAMP WILL NOT TURN ON.

NO DOUBLE CONNECT DOES NOT APPLY TO OUTGOING TRUNKS INVOLVED IN TRUNK TO TRUNK CONNECTIONS.

SPEED CALLING CANNOT BE USED TO INPUT THE TRUNK GROUP AND MEMBER NUMBER DUE TO THE USE OF OCTOTHORPS.

BUSY VERIFICATION TONE _____

REFERENCE F1173 "BUSY VERIFICATION - LINE" FOR TONE CHARACTERISTICS AND DESIGN CONSIDERATIONS.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT TRANSFER
Feature no	F0772

DESCRIPTION

When a station transfers a call to the attendant by either flashing or by flashing and dialing 0, the call will be queued on a FIFO basis. Please refer to the following:

F0414 - "Call Transfer/Three Way Calling"
F0383 - "Uniform Call Distribution"
F0374 - "Attendant Hold"

The Call Transfer Type permitted by IBN customr group stations is defined at the customer group level. The types are:

1. No Call Transfer except to the attendant (NCT)
2. Call Transfer of Incoming Calls (CTINC)
3. Call Transfer of Outgoing Calls (CTOUT)
4. Call Transfer of All Calls (CTALL)

Once the attendant has answered a Call Transfer call type and the call was not previously held on loop, the console lamp states will be:

- Source lamp ON
- Destination lamp ON (this assumes that the station which activated call transfer has remained off-hook)
- Attendant ICI ON (if equipped)
- Exlcude Source lamp ON if Secrecy is set

If the station which activated call transfer goes on-hook prior to attendant answer, the call will still be queued for the attendant but the transferring station can both place and receive new calls.

The following assumes that the transferring station has remained off-hook until attendant answer. If the Secrecy option is set - reference F0774, the attendant can talk privately to the destination (party who activated call transfer). The Exclude Source lamp will be ON and the source will be excluded. If the Secrecy option is not set, the attendant, transferred and transferring parties will be involved in a 3 way call via the 3 port conference circuit associated with the console.

The lamp states will be:

- Exclude Source lamp OFF
- Source Lamp ON (transferred party on source side)
- Destination Lamp ON (transferring party on destination side)
- Attendant ICI ON (if equipped).

The transferring station cannot activate any features while connected to the attendant. The transferring station can only go on-hook. This also applies while the call is queued for an attendant console.

While talking to the transferring party, the attendant can depress the release destination key. This will cause the transferring station to be released; if the transferring station is via a trunk, on-hook supervision will be sent to the far end.

Once the destination has gone on-hook, the attendant can:

- Dial a new destination. Upon dialing the first digit of the destination, the DEST lamp turns ON and the Exclude Source lamp turns ON if the Secrecy option is set (Reference F0774 "Secrecy").
- Release the source party by depressing either the Release Source or Release key.

When a station initiates call transfer and the call was previously held on loop (reference F0374 "Attendant Hold"), the call transfer is not queued for an idle console but is presented on the same console and loop on which the call was originally held. During recall (before the attendant answers) the other party is placed on hold and the console lamp states associated with the held loop will be:

- Source lamp flashes at 120 IPM
- Dest lamp flashes at 120 IPM

The Attendant ICI does not turn ON for calls which are held on loop.

The attendant can answer the call transfer by depressing the loop key associated with the call. The Lockout feature (reference F0376), if set, does not apply once a station activates call transfer to the attendant.

After the attendant depresses the loop key, the lamp states will be:

- Source lamp ON
- Destination lamp ON
- Exclude Source lamp ON if Secrecy option is set

The remainder of the call sequence is as previously described.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT ACCESS TO PAGING
Feature no	F0773

FEATURE SYNOPSIS

This feature permits stations and attendants to access customer-provided loudspeaker paging equipment to summon a particular person by announcing over speakers located throughout the customer's premises.

Access can be provided for the following paging system configurations:

1. Single paging system/single zone
2. Single paging system/multiple zone
3. Multiple paging systems/single zone per system

These configurations are accessed by dialling an appropriate access code. Single paging system/multiple zone will not be supported by DMS for DP outpulsing. Multizone paging will be supported for DTMF outpulsing by DP or DTMF sets using Senderized Operation. Only an access code will be analysed by DMS.

This feature also provides an optional pre-empt capability for the attendant.

FEATURE DESCRIPTION

Single Paging System/Single Zone

Where a customer group has only one loudspeaker paging system arranged for single zone operation, the station goes off-hook, receives dial tone, and dials a loudspeaker paging access code (e.g., 1XX). The paging access trk is seized, and a network connection is established between the originating station and the paging access trk. No confirmation tone is returned. Loudspeaker amplifier cut-through and noise provide sufficient indication that a broad-cast path exists.

Multiple Paging Systems/Single Zone Per System

Where a customer group has more than one loudspeaker paging system, but each system addresses only one paging zone, the operation is identical to the Single Paging System/Single Zone arrangement above. In this case, however, a different access code is required for each paging system.
sp:Single Paging System/Multiple Zone

Where a customer group has a single paging system, but the system can address several paging zones under user control, operation is as follows:

The originating station goes off-hook, receives dial tone and dials a loudspeaker paging access code (e.g., 1XX).

Dial tone is returned to the originating station. The station dials the code associated with the desired zone, the digits are collected, dial tone is removed (after first digit), the paging access trunk is seized, a DTMF sender is connected to the paging access trunk. The zone digits are out-pulsed and a network connection is then established between the paging access trunk and the originating station.

Attendant Access to Loudspeaker Paging

The attendant can access loudspeaker paging equipment by operating an idle LOOP key and following the activation sequence previously described. However, here will be no dial tone (first or second) and all digits have to be received at once.

The attendant pre-empt option is provided by the Busy Verification feature.

Feature access is limited to intra-group stations, attendants and trunks. Interface to Loudspeaker Paging is presently via a trunk card. In the future (BCS 11) interface would be by means of a line card, hence the feature can be offered off the remotes.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	SECRECY
Feature no	F0774

DESCRIPTION

ON ALL CALLS, THE SOURCE (CALLING PARTY) IS AUTOMATICALLY EXCLUDED IF SECRECY IS SET FROM THE ATTENDANT WHEN THE ATTENDANT BEGINS TO KEY THE DESTINATION (CALLED) NUMBER. THE ATTENDANT MAY TALK TO THE DESTINATION WITHOUT THE SOURCE HEARING. WHEN THE ATTENDANT RELEASES FROM THE CALL, THE SOURCE AND DESTINATION ARE CONNECTED.

SECRECY IS AUTOMATICALLY ACTIVATED WHEN THE SECRECY OPTION IS SET. THIS OPTION, IF SET, APPLIES TO ALL ATTENDANT CONSOLES.

SECRECY WILL APPLY, EVEN IF THE OPTION IS NOT SET IF:

- THE SOURCE CONSISTS OF MORE THAN ONE PARTY WITHIN DMS,
- WHILE THE ATTENDANT IS ESTABLISHING A CONFERENCE CALL (FUTURE FEATURE).

AFTER HAVING ANSWERED AN INCOMING CALL, THE ATTENDANT KEYS THE CALLED NUMBER. WHEN THE FIRST DIGIT IS KEYED, THE EXCLUDE SOURCE LAMP WILL TURN ON AND THE SOURCE IS EXCLUDED. AFTER KEYING THE CALLED NUMBER THE ATTENDANT CAN:

- DEPRESS THE RELEASE KEY. THE SOURCE CAN TALK TO THE CALLED PARTY, OR THE SOURCE WILL HEAR AUDIBLE RINGBACK TONE.
- WAIT FOR THE CALLED PARTY TO ANSWER. ONLY THE ATTENDANT WILL HEAR RINGBACK TONE. IF THE CALL IS UNANSWERED, THE ATTENDANT CAN TALK PRIVATELY WITH THE DESTINATION. WHEN THE ATTENDANT RELEASES THE CALL FROM THE CONSOLE OR HOLDS THE CALL ON LOOP, THE SOURCE AND DESTINATION ARE CONNECTED AND THE EXCLUDE SOURCE LAMP TURNS OFF.
- DEPRESS THE LOOP KEY ASSOCIATED WITH THE CALL. THIS CANCELS THE SECRECY FEATURE AND ESTABLISHES A CONFERENCE CALL BETWEEN THE ATTENDANT, SOURCE AND DESTINATION. THIS KEYING ACTION IS DISALLOWED IF THE SOURCE CONSISTS OF MORE THAN ONE PARTY WITHIN DMS OR THE LOCKOUT OPTION IS SET (REFERENCE F0376 "LOCKOUT"). IF THE CALLED STATION IS BUSY, ONLY THE ATTENDANT HEARS 2 SECONDS OF BUSY TONE. AFTER TIMEOUT OF BUSY TONE, THE ATTENDANT IS RECONNECTED WITH THE SOURCE. THE EXCLUDE SOURCE LAMP TURNS OFF.

IF THE ATTENDANT DEPRESSES THE LOOP KEY DURING THE 2 SECONDS OF BUSY TONE, THE ATTENDANT AND SOURCE ARE RECONNECTED AND THE EXCLUDE SOURCE

LAMP TURNS OFF. THE PRECEDING ALSO APPLIES IF THE CALLED STATION IS BUSY WITH A CALL ALREADY WAITING OR CAMPED-ON EXCEPT THAT THE ATTENDANT HEARS REORDER TONE.

BOTH A SOURCE AND DESTINATION CANNOT BE EXCLUDED SIMULTANEOUSLY.

DEPRESSING RELEASE SOURCE DURING BUSY OR REORDER TONE IS INVALID. THE ATTENDANT MUST FIRST GIVE A BUSY REPORT TO THE SOURCE BEFORE RELEASING THE CALL.

IF THE SECRECY OPTION IS SET AND THE ATTENDANT ANSWERS A TRANSFERRED CALL - F0414 "CALL TRANSFER/THREE WAY CALLING", THE EXCLUDE SOURCE LAMP WILL TURN ON AND THE ATTENDANT WILL BE CONNECTED WITH THE TRANSFERRING PARTY. THE TRANSFERRED PARTY WILL BE ON THE SOURCE SIDE AND WILL BE EXCLUDED. THIS ASSUMES THAT THE TRANSFERRING PARTY REMAINED OFF-HOOK AFTER FLASHING OR FLASHING AND DIALING 0. THE PRECEDING APPLIES TO BOTH DEQUEUED RECALLS AND HELD LOOP RECALLS.

THE SECRECY OPTION IS ENABLED BY DEFAULT. IF THE LOCKOUT OPTION IS SET, SECRECY MUST ALSO BE SET. HOWEVER, SECRECY CAN BE SET WITHOUT THE LOCKOUT OPTION.

THE FOLLOWING FIGURE ILLUSTRATES DMS-100 ACTIONS UNDER VARIOUS CIRCUMSTANCES.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	CODE RESTRICTIONS
Feature no	F0776

DESCRIPTION

This feature denies or permits selected station lines and network access trunks the ability to complete outgoing exchange network calls to selected office/area codes (NPA, NXX). The restricted calls are routed to the attendant, an announcement or tone, on a per customer basis.

This feature excludes the following:

- local CO access (typically 9+). This is covered by Line Restriction Codes. Reference F0388 "Class of Service Restrictions".
- access to CCSA/EPSCS, trunk-to-trunk restrictions. These are defined in F0388.

Code restriction will not apply to stations which are assigned option Toll Denial or Toll Diversion.

This feature will not apply if cut-thru dialing is used on a trunk group.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	ACCESS TO	CCSA	
Feature no	F0777		

DESCRIPTION

IT PROVIDES INWARD AND OUTWARD ACCESS TO COMMON CONTROL SWITCHING ARRANGEMENT (CCSA). THIS ACCESS IS SUBJECTED TO CLASS OF SERVICE RESTRICTION. ACCESS IS ACHIEVED WHEN A BUSINESS SERVICE CUSTOMER DIALS A SUITABLE ACCESS CODE (USUALLY 8) AND THE DMS WILL CONNECT THE SUBSCRIBER TO THE CCSA NODE VIA A SUITABLE TRUNK.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	DIAL PULSE CONVERSION	DP TO DTMF	
Feature no	F0778		

DESCRIPTION

Feature Requirements

DMS must be capable of receiving DTMF on incoming trunks and transmitting DTMF on outgoing trunks. NT3X68 will be used for DTMF outpulsing and will require network connections between an MTM for the DTMF transmitter and the outgoing trunk. Diagnostics will be required for the transmitter card.

Feature Restrictions

This feature specifically does not include DP to DP, DTMF to DP, DP to DTMF overlap outpulsing or cut through operation. Senderized operation only applies.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	DIAL PULSE CONVERSION	DTMF TO DP	
Feature no	F0779		

SEE FEATURE NUMBER F0778

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set SERVICES
Feature CLASS OF SERVICE RESTRICTIONS TOLL RESTRICTED SERV
Feature no F0787

SEE FEATURE NUMBER F0388

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	CONSULTATION HOLD
Feature no	F0848

FEATURE SYNOPSIS

There are three types of call transfer available to IBN users. These are:

CT INC - Call Transfer of Incoming Calls
CT OUT - Call Transfer of Outgoing Calls
CT ALL - Call Transfer of All Calls

Included in these features are:

Consultation Hold

This permits the transferring party to talk privately with the destination before transferring the call.

Add-On

This permits the transferring party to establish a 3 way call prior to transferring the call.

Each of these features allows the station user, without the assistance of the attendant, to establish a 3 way call and transfer a call. The Call Transfer feature requires the use of the 3 port conference circuit.

CT INC. CT OUT or CT ALL must be assigned on a CUSTOMER GROUP basis. When assigned to a customer group, individual station restrictions will still apply. Three way calling is assigned on a per line basis. When assigned, station restrictions still apply.

Call transfer is denied if an attempt is made to connect 2 trunks without disconnect supervision. Consultation occurs once only. This feature does not include consultation flip-flop.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	RING AGAIN
Feature no	F1151

FEATURE SYNOPSIS

This feature allows a station originator, when encountering a busy station to flash the switchhook, dial a code and go on hook. When the busy station becomes idle it is automatically connected to the originator and ring his set. A distinct ringing code is used.

FEATURE DESCRIPTION

Station A is assigned the Ring Again (RAG) feature and calls B. B is busy and A hears busy tone. A flashes, hears special dial tone and dials the RAG feature code. A hears confirmation tone and goes on-hook. A is free to place or receive other calls.

When B becomes idle, A is alerted by RAG ringing. To answer the RAG recall, A goes off-hook. Once A is off-hook, station B is rung and A hears audible ringback tone.

FEATURE TONES

Confirmation tone will tell A that:

1. The RAG request has been accepted by DMS-100
2. A will be notified when B becomes idle.

RAG ringing will consist of coded ringing code 4, namely, 1.5 seconds ON, 0.5 seconds OFF, 0.5 seconds ON, 0.5 seconds OFF, 0.5 seconds ON, 0.5 seconds OFF (ref V0586 Distinctive Ringing). Ring Code 4 will continue for the duration of the Customer Group defined RAG recall timer.

This feature only applies if both the originating and terminating stations are served by the same DMS-100. Both stations must belong to the same customer group.

REFERENCES

OID V0533

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	ACCESS TO	EPSCS	
Feature no	F1160		

FEATURE SYNOPSIS

In addition to inward and outward access to the DDD and EAS networks, inward and outward access is provided from and to EPSCS (Enhanced Private Switched Communication Systems). Access is subject to Class of Service Restrictions associated with station line user. It is not necessary to pass class marks between networks, but dial plan compatibility is required.

An access line or access line group is provided from any PBX for the purpose of sharing network facilities. Access lines will function in a manner similar to tie trunk operation.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	ACCESS TO	CO FROM PBX	
Feature no	F1161		

FEATURE SYNOPSIS

An access line or access line group is provided from any PBX for the purpose of sharing network facilities. Access lines will function in a manner similar to tie trunk operation.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	END TO END SIGNALLING
Feature no	F1164

FEATURE SYNOPSIS

End to end signalling is accomplished on internal and external connections utilizing a DTMF set.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	FOREIGN EXCHANGE (FX) TRUNK - ANALOG
Feature no	F1165

DESCRIPTION

FOREIGN EXCHANGE LINE IS AN INDIVIDUAL LINE FURNISHED FROM AN EXCHANGE WHICH DOES NOT NORMALLY SERVE THE AREA IN WHICH THE CUSTOMER TO SUCH SERVICE IS LOCATED. THE FX LINE APPEARS AS A TRUNK IN THE DMS HUB. THE STATION USER DIALS AN ACCESS CODE TO SEIZE THE FX TRUNK, A DIAL TONE MAY OR MAY NOT BE RETURNED. THE STATION THEN DIALS THE REQUIRED NUMBER.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	OPERATIONAL MEASUREMENTS	-	IBN
Feature no	F1171		

FEATURE SYNOPSIS

Two new OM tables have been added which are applicable only to a DMS-100 Family Office equipped for IBN services:

IBNGRP: IBN Customer Group OM Table

IBNSG: IBN Customer Subgroup OM Table

The IBNGRP Table has one register per customer group (up to 128 groups). The IBNSG subgroup table has one counter per subgroup (up to 8 subgroups per customer group).

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	AUTOMATIC LINE
Feature no	F1172

FEATURE SYNOPSIS

When going off-hook, the calling station is automatically connected to a preselected called station without dialling. If the called station is off-hook, busy tone is returned to the calling station.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)	
Feature set	ATTENDANT FEATURES	
Feature	BUSY VERIFICATION	- STATIONS
Feature no	F1173	

DESCRIPTION

THIS FEATURE PERMITS THE ATTENDANT TO VERIFY THE CONDITION OF A STATION LINE WITHIN THE CUSTOMER GROUP AS TO IT'S BUSY, IDLE, OUT OF ORDER STATE.

BY OPERATING THE BUSY VERIFICATION KEY AND DIALING THE DIRECTORY NUMBER, THE ATTENDANT CAN BREAK INTO AN EXISTING VOICE CONNECTION AND VERIFY THAT THIS NUMBER IS ACTUALLY BUSY. THE ATTENDANT CAN- NOT CONNECT ANOTHER PARTY TO THE BUSY CONNECTION.

BUSY VERIFICATION MAY BE DENIED TO SPECIFIC STATIONS BY ASSIGNING OPTION NO DOUBLE CONNECT TO THESE LINES.

THIS FEATURE IS AVAILABLE TO ATTENDANT CONSOLES ONLY. IT CAN BE ASSIGNED TO ONE OR MORE CONSOLES. THIS FEATURE NEED NOT BE ASSIGNED TO ANY CONSOLES.

IF THIS FEATURE IS REQUIRED, A KEY ON THE CONSOLE MUST BE ASSIGNED TO THIS FEATURE. OPTION BVL MUST BE ASSIGNED TO EACH CONSOLE WHICH IS TO HAVE THIS OPTION.

FEATURE RESTRICTIONS _____

AN ATTENDANT CANNOT ENTER A CONNECTION IF THE STATION ALREADY HAS A CALL CAMPED-ON OR WAITING.

IF THE STATION IS IN AN UNSTABLE STATE (DIALING, RINGING), THE ATTENDANT CANNOT ENTER THE CONNECTION.

THE ATTENDANT CANNOT FORCE RELEASE A CONNECTION. THE ATTENDANT CAN ONLY REQUEST THE CALLED PARTY TO GO ON-HOOK.

THE ATTENDANT CAN ONLY BUSY VERIFY LINES WHICH BELONG TO THE CUSTOMER GROUP AND WHICH ARE DIRECTLY SERVED (LM OR RLM) BY THE SAME DMS-100.

THE ATTENDANT CANNOT OLD A BUSY VERIFY CALL. IF ANY KEY OTHER THAN NIGHT OR POSITION BUSY E.G. AND KEY WHICH WILL RESULT IN HOLD (MANUAL OR AUTOMATIC) IS DEPRESSED, THE KEYING ACTION IS IGNORED.

FEATURE USE _____

TO VERIFY AN APPARENTLY BUSY STATION, THE ATTENDANT DEPRESSES AN IDLE LOOP KEY AND THEN OPERATES THE BY VER KEY. THE LAMP STATES WILL BE:

- RLS LAMP OFF - SRC LAMP ON - BY VER LAMP ON

THE ATTENDANT NOW KEYS THE STATION NUMBER (2, 3, 4 OR 5 DIGITS TYPICALLY). IF THE CALLED STATION IS IDLE, THE LAMP STATES WILL BE:

- RLS LAMP OFF - SRC LAMP ON - BY VER LAMP ON

IF THE STATION IS IDLE, THE ATTENDANT WILL HEAR SILENCE. THE ATTENDANT CAN CAUSE THE STATION TO BE RUNG BY DEPRESSING THE SIGNAL SOURCE KEY. THE ATTENDANT WILL HEAR AUDIBLE RINGBACK TONE. IF THE STATION ANSWERS, THE STATION BECOMES THE SOURCE AND THE BY VER LAMP WILL TURN OFF.

IF THE STATION IS BUSY, NO CALLS ARE CAMPED-ON OR WAITING FOR THE STATION AND THE STATION DOES NOT HAVE OPTION NDC ASSIGNED TO IT, THE LAMP STATES WILL BE:

- RLS LAMP OFF - SRC LAMP ON - BY VER LAMP ON

THE ATTENDANT WILL NOW BE ABLE TO TALK TO THE CALLED STATION. THE OTHER PARTY IN THE CONNECTION JUST BROKEN INTO WILL ALSO BE ABLE TO HEAR.

IMMEDIATELY PRIOR TO ATTENDANT BREAK-IN, BOTH PARTIES IN THE BUSY CONNECTION WILL HEAR BUSY VERIFICATION TONE.

THE ATTENDANT CAN RELEASE FROM ANY OF THE PRECEDING BY OPERATING THE RLS KEY. WHEN RLS IS OPERATED, THE LAMP STATES WILL BE:

- RLS LAMP ON - SRC LAMP OFF - BY VER LAMP OFF

THE ATTENDANT WILL HEAR REORDER TONE IF ANY OF THE FOLLOWING OCCUR:

- THE STATION IS IN AN UNSTABLE STATE (DIALING, RINGING)
- THE ATTENDANT DIALS AN INVALID STATION NUMBER E.G. THE NUMBER IS NOT ASSIGNED
- A 3 PORT CONFERENCE CIRCUIT IS NOT AVAILABLE
- A NETWORK CONNECTION CANNOT BE MADE

THE ATTENDANT WILL HEAR BUSY TONE IF ANY OF THE FOLLOWING OCCUR:

- THE STATION IS BUSY AND ALREADY HAS A CALL WAITING OR CAMPED-ON
- ATTENDANT VERIFICATION IS DISALLOWED FOR THIS STATION (OPTION NDC IS SET)

- THE STATION IS INVOLVED IN A 3 WAY CALL
- ANOTHER ATTENDANT IS ALREADY VERIFYING THE STATION
- THE STATION IS ASSIGNED OPTION DTM (DENIED TERMINATION).
REGULAR CALLS CANNOT TERMINATE ON SUCH LINES. HOWEVER,
THESE LINES CAN BE TESTED FROM THE MAP
- THE STATION NUMBER IS SUSPENDED OR ON PLUG-UP

FEATURE INTERACTION _____

IF THE ATTENDANT ATTEMPTS TO BUSY VERIFY A STATION WHICH IS PART OF A HUNT GROUP, HUNTING WILL NOT TAKE PLACE. THEREFORE, THE FOLLOWING WILL APPLY:

- IF THE HUNT TRYP ID DNH, BUSY VERIFICATION WILL TAKE PLACE FOR THE NUMBER DIALED. FOR DNH HUNT GROUPS, EACH LEN HAS A DN.
- IF THE HUNT TYPE IS MLH OR DLH, BUSY VERIFICATION WILL APPLY ONLY TO THE PILOT DN. MLH AND DLH GROUPS ONLY HAVE ONE DN, THE PILOT DN.

IF THE ATTENDANT ATTEMPTS TO BUSY VERIFY A STATION WHICH HAS ACTIVATED ANY TYPE OF CALL FORWARDING EXCEPT CALL FORWARDING TO THE ATTENDANT, THE ATTENDANT WILL BE FORWARDED. HOWEVER, THE BUSY VERIFY LAMP WILL TURN OFF. BUSY VERIFICATION WILL NOT LONGER APPLY ONCE THE ATTENDANT IS FORWARDED. INSTEAD, THE CALL FORWARDING FEATURE APPLIES. REFERENCE V0451.

IF THE ATTENDANT ATTEMPTS TO BUSY VERIFY A STATION WHICH HAS CALL FORWARD-DON'T ANSWER, THE STATION DOES NOT ANSWER WITHIN X SECONDS CYCLES AND THE ROUTE IS NOT BACK TO THE ATTENDANT, THE CALL WILL BE FORWARDED. HOWEVER, THE BUSY VERIFY LAMP WILL TURN OFF. BUSY VERIFICATION WILL NO LONGER APPLY ONCE THE ATTENDANT IS FORWARDED. INSTEAD, THE CALL FORWARD-DON'T ANSWER FEATURE WILL APPLY. REFERENCE V0452.

IF THE ATTENDANT ATTEMPTS TO BUSY VERIFY A STATION WHICH HAS CALL FORWARD - BUSY AND THE ROUTE IS NOT BACK TO THE ATTENDANT, THE ATTENDANT WILL BE FORWARDED IF THE STATION IS BUSY. BUSY VERIFICATION WILL NO LONGER APPLY ONCE THE ATTENDANT IS FORWARDED. INSTEAD, THE CALL FORWARD - BUSY FEATURE WILL APPLY. ONCE THE ATTENDANT IS FORWARDED, THE BUSY VERIFY LAMP WILL TURN OFF.

ANY KEYING SEQUENCES OTHER THAN THOSE PREVIOUSLY DESCRIBED ARE INVALID E.G. IF THE ATTENDANT ORIGINATES A CALL ON THE SOURCE SIDE AND THEN DEPRESSES THE BUSY VERIFICATION KEY, THE KEYING ACTION IS IGNORED AND THE BUSY VERIFY LAMP WILL NOT TURN ON. KEYING SEQUENCES MUST BE EXACTLY AS PREVIOUSLY SHOWN.

THE PRECEDING FEATURE INTERACTION PERTAINING TO CALL FORWARDING DOES NOT APPLY TO LINES UNDER TEST FROM A MAP.

SPEED CALLING CAN BE USED TO INPUT THE STATION NUMBER.

BUSY VERIFICATION TONE _____

BUSY VERIFICATION TONE IS 440 HZ. IT CONSISTS OF AN INITIAL 2 SECOND BURST OF TONE, FOLLOWED BY 15 SECONDS OF NO TONE, 500 MSEC OF TONE, ETC. THE 500 MSEC ON AND 15 SECONDS OFF CYCLE IS REPEATED FOR AS LONG AS THE ATTENDANT IS CONNECTED TO A BUSY STATION. CONVERSATION WILL BE MOMENTARILY INTERRUPTED TO INJECT TONE.

BUSY VERIFICATION TONE IS PROVIDED VIA A SERVICE CIRCUIT. NETWORK CONNECTIONS WILL BE REQUIRED TO INSERT TONE. A 3 PORT CONFERENCE CIRCUIT IS REQUIRED TO PERMIT THE ATTENDANT AND THE 2 PARTIES BROKEN INTO TO BE ABLE TO TAKE TO EACH OTHER.

DEPENDING ON FEATURE DESIGN, THE ATTENDANT MAY OR MAY NOT HEAR BUSY VERIFICATION TONE, HOWEVER, BOTH PARTIES OF THE BROKEN INTO CONNECTION WILL HEAR TONE.

TO MAKE FEATURE IMPLEMENTATIONS SIMPLER, A TIMER WILL BE USED. UPON TIMER EXPIRY, THE ATTENDANT WILL BE REMOVED FROM THE BUSY CONNECTION, THE BY VER LAMP WILL TURN OFF, BUT THE SRC WILL REMAIN ON (HAVE ATTENDANT IN ORIGINATING STATE). THE ATTENDANT CAN RELEASE FORM THE LOOP OR ORIGINATE A CALL.

BY USING A TIMER, NETWORK RESERVATION AND USE WILL AT LEAST BE MINIMIZED. SP1 CENTREX ALSO CUT THE ATTENDANT OUT OF THE CONNECTION AFTER A TIME (45 SECONDS). FOR SIMPLICITY, THE TIMER VALUE WILL BE FIXED E.G. NOT A CUSTOMER GROUP PARAMETER, BUT WILL NOT BE SHORTER THAN 45 SECONDS.

ONCE THE ATTENDANT RELEASES (OR IS RELEASED BY DMS) THE CALL PREVIOUSLY BROKEN INTO WILL BE RECONFIGURED AS A REGULAR 2 PORT CALL.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	POSITION BUSY
Feature no	F1176

DESCRIPTION

This feature allows the attendant to make the console unavailable to further incoming calls. The attendant can still originate calls and use or program the features available while the console is in the position busy state if at least 1 headset or handset remains plugged in to the console.

This is an attendant console feature only.

Position busy will be an optional feature. It is assigned on a per console basis. It has marginal use in single console operation.

One of the 16 feature keys and associated lamps can be assigned to this feature. This feature can also be assigned to 1 of the 32 optional keys and lamps.

The POS by lamp will have 2 states: ON and OFF.

In multiple console operation, the actual key and associated lamp assignment need not appear in the same place on every console.

Only 1 key and lamp can be assigned to this feature per console.

Feature Use

During the routine handling of a call (attendant has answered the call), the attendant can prevent further incoming calls from being presented to that particular console by depressing the position busy key. The current call is not affected.

The attendant can also depress the position busy key while a call is being presented on a loop but before answering. This will cause the call to remain at the head of the attendant queue. The console will now be in the position busy mode.

To deactivate position busy, the attendant depresses the position busy key a second time. This keying action is ignored if a handset or headset is not plugged in.

Position busy is automatic when a headset or handset is unplugged.

Attendant Keying and Console Lamp States

If the attendant depresses the position busy key after having answered, but before releasing the call, the position busy lamp will turn ON. When the call is released, the RLS lamp will turn ON. However, the console will not be presented with new incoming calls.

If the attendant depresses the position busy key while being alerted to a call on a loop, the call will remain at the head of the attendant queue. The SRC lamp for the loop on which the call was presented will turn OFF. Any ICI that had been on or were flashing, will turn OFF. The RLS lamp will turn ON. The calls waiting lamp will continue to be updated. Any calls that had previously been extended via the hold feature will continue to be displayed on the console that is in the position busy state.

If the attendant depresses the position busy key while the console is idle (RLS lamp ON), the lamp states will be:

- RLS lamp stays ON
- Position Busy lamp turns ON

If the attendant unplugs both handsets or headsets (assuming more than 1 was plugged-in), the position busy lamp will turn on but the call will remain on that loop at that position for 1 minute only. To return to the caller, a headset must be plugged-in and the position busy key must be operated (position busy lamp turns OFF).

Single Console Operation

Depressing the position busy key will cause both the position busy and nite lamps to turn on. Further incoming calls will be given night service treatment. Depressing the nite key will turn on both the position busy and nite lamps.

To remove night service, the attendant will depress the nite key. This will turn off both the position busy and nite lamps.

Note: A headset must be plugged-in before this keying action is valid.

If, after depressing POS BY, all headsets are removed, POS BY, held calls, etc., will only be displayed for 1 minute. After 1 minute all lamps turn OFF.

Multiple Console Operation

Depressing the position busy key will cause the position busy lamp to turn on. Incoming calls will be distributed to the remaining attendant positions.

When the last manned position depresses position busy, nite or unplugs the headset, the position busy and nite lamp will turn on at this position. Night Service will be activated. If the headset is unplugged for more than 1 minute, all lamps on the console turn off.

To remove night service, a headset must be plugged in. This causes nite to turn on. Operation of this nite key will cause the nite lamp to turn off at all positions. The position busy lamp will only turn off at the console which has just become available to accept calls from the attendant queue. Note that no lamps will be on at any position which has not had a headset seated for more than one minute.

ADDING OR CHANGING A NUMBER
SHORT LIST EXAMPLE

TYPE OF NUMBER TO BE STORED	KEYING SEQUENCES	DMS RESPONSE

STATION NUMBER	SCK+SDT+0+23456+SCK+CT	
LOCAL C.O.	SCK+SDT+1+9+7D+SCK+CT	
DDD	SCK+SDT+2+9+(1)+7/10D+SCK+CT	
IDDD	SCK+SDT+3+9+011+7to12D+SCK+CT	
LOCAL TANDEM	SCK+SDT+4+1+5D+SCK+CT	
EPSCS	SCK+SDT+5+28+7/10D+SCK+CT	
ACCOUNT CODE	SCK+SDT+6+ ³ 13456+SCK+CT	
TANDEM TIE TRUNKS	SCK+SDT+7+8+ ³ +144+ ³ +85+ ³ +830+ ³ SCK+CT	

Legend & Notes

SCK = Speed Calling Key

SDT = Special Dial Tone

number above following SDT = Speed Calling Code assigned to number being stored.

CT = Confirmation Tone

³ = 3 second pause insertion for dial repeating tie trunks. If entered as the last digit (see above), it will mean that the attendant has stored a partial number. When feature is used, the attendant can enter additional digits.

³ = Immediately following Speed Calling code, means number is an Account Code.

Note: If attendant enters # following number to be stored, it will serve as "last digit entry" character. It is not stored. However, to turn off the lamp, the Speed Calling key must be depressed.

To delete a number from the list, the attendant will:

1. Depress the Speed Calling key. This will cause the RLS lamp to turn OFF (if it had been ON) and the Speed Calling lamp to flash at 120 IPM. The attendant will hear Special Dial Tone.
2. Enter the single or two digit code assigned to the number which is to be deleted followed by octothorpe (#).
3. Depress the Speed Calling key again. This will cause the Speed Calling lamp to turn OFF. The attendant will hear Confirmation Tone via the headset/handset.

E.G. SCK+SDT+0+#+SCK+CT

To delete another number from the list, the attendant will repeat the above process.

In both the above cases, when the attendant depresses the Speed Calling key the second time, the RLS lamp will turn ON and the console will be available for new calls unless either the Position Busy or Night key had been depressed prior to the start of Speed Calling programming.

If the queue length (calls waiting for answer) is such that is console becomes immediately eligible for a new call, the RLS lamp will not turn ON. Instead, the attendant will be alerted to the waiting call.

Speed Calling Use

(a) Attendant Originates Call

1. The attendant depresses an idle loop key. This causes the RLS lamp to turn OFF (if it had been ON) and the Source lamp to turn ON.
2. The attendant will depress the Speed Calling key. This causes the Speed Calling lamp to turn ON.

3. The attendant keys the single or two digit number previously assigned to the stored number. Once the attendant has input the one or two digit code, the Speed Calling lamp will turn OFF.

The call now progresses as though the attendant had dialed the complete number except that call progress tones e.g. dial tone from the distant end (tandem tie trunk example), will not be heard by the attendant.

(b) Attendant Completes Call

1. After having answered a call by depressing the loop or ICI key, the attendant depresses the Speed Calling key. This causes the Speed Calling lamp to turn ON.
2. Upon keying the first (or only digit) of the Speed Calling code, the DEST lamp will turn ON and the source will be excluded (EXCL SRC lamp turns ON) if the Secrecy option is set. After the Speed Calling code has been input, the Speed Calling lamp will turn OFF.

The call now progresses as though the attendant had dialed the complete number EXCEPT that call progress tones e.g. distant end dial tone, will not be heard by the attendant or source (if not excluded via secrecy).

Invalid Keying

(a) Programming Mode

After the Speed Calling key is depressed, standard timeouts will apply between digits. If timeout occurs, the attendant will hear reorder tone and the Speed Calling lamp will turn OFF.

DMS will not validate Speed Calling numbers stored at programming time. Validation only occurs when the feature is used. Therefore, if the attendant enters a valid number (it's validity is known only to the attendant) and neglects to depress the Speed Calling key a second time, the Speed Calling lamp will turn OFF but Confirmation Tone will not be returned. The number input will not be stored. If the attendant was attempting to overwrite a number in the Speed Calling list, the existing stored number is left intact. Standard timeout (10 seconds) applies between last digit or character entry and depressing the Speed Calling key a second time.

If the attendant enters an invalid Speed Calling code, reorder tone instead of Confirmation Tone will be returned when the attendant depresses the Speed Calling key a second time. This can occur if the attendant is assigned a long list consisting of 30 numbers and a code is input which is valid only for the 50 number long list.

If the attendant enters a valid Speed Calling code and then depresses the Speed Calling key again (end of programming), any number which has been stored is not affected. If the attendant attempts to enter more than 24 characters and digits following the Speed Calling code, reorder tone will be returned instead of Confirmation Tone.

Operating a loop key after depressing the Speed Calling Key will turn the Speed Calling lamp OFF and the Source lamp ON. Any digits which may have been entered while in the programming mode are not stored.

Entering octothorpe (#) and then dialing additional digits instead of depressing the Speed Calling key is invalid. When, and if, the attendant depresses the Speed Calling key, reorder tone instead of Confirmation Tone will be heard.

(b) Speed Calling Use Mode

Depressing the Speed Calling key prior to operating a loop key puts the console into the programming mode.

Depressing a loop key, dialing a partial number and then depressing the Speed Calling key is invalid and will result in reorder tone.

If the speed calling key is depressed while the attendant is active on a call e.g. both a Source and Destination exist, the key depression is ignored.

Reorder tone will be given if the attendant attempts to use a valid speed calling code with nothing stored against it. This is consistent with the POTS speed calling feature.

Extra digits entered after the speed call code has been entered will be ignored unless the stored number ends in a³.

Unexpected key strokes before the full speed call code has been entered (e.g. another loop key) will be processed and will cause the speed call lamp to turn off if/when the speed call key is depressed again, or after a 10 second time out.

Feature Interaction

Speed Calling can be used to enter an Account code. The attendant, while active on loop, depresses the Account key followed by the Speed Calling key and the Speed Calling code assigned to the Account number. Reference V0495 "Attendant Call Detail Entry".

Speed Calling can be used to establish a 6 port conference call. Reference F0367 "Attendant Conference".

Speed Calling cannot be used to program Flexible Night Service. To program night connections, the attendant MUST NOT be engaged on a loop. To use Speed Calling, the attendant MUST FIRST access a loop. Therefore these features are mutually exclusive.

If the attendant is alerted to a call waiting in queue for answer and depresses the Speed Calling key instead, the console will be in the Speed Calling programming mode. The Source lamp will turn from flashing to OFF.

To program Speed Calling, a headset or handset must be plugged in.

An attendant may be a Speed Calling user (see feature requirements below) in which case the attendant can only use, not program Speed Calling. If the attendant is a user only, a loop has not been accessed and the attendant depresses the Speed Calling key (programming mode), the Speed Calling lamp will not turn ON or flash. Attendant Group Speed Calling only applies to Long Lists (Same as 500/2500 set Group Speed Calling feature).

If a console is a Group Speed Calling user, no restrictions apply to access to toll numbers in the Group Speed Calling list (unlike 500/2500 set Group Speed Calling feature). The user console has access to all numbers in the list.

A station set (500/2500 set) can be a user of an attendant's Speed Calling Long list. This is done by specifying the CONT LEN (Controller's LEN). This will be the controlling console's Voice line card. However, access to toll numbers in an attendant's Speed Calling list by a station can be allowed/denied - reference V0459 "Speed Calling Group".

An attendant console CANNOT be a user of a station's Speed Calling list.

If an attendant is a Speed Calling User and uses a Speed Calling number while the controller is updating the list, the number may or may not be valid. No checks will be made to prevent this occurrence.

Users cannot be users of user Speed Calling.

Users and controllers must belong to the same Customer Group. The sub-groups involved can be different.

Speed Calling Feature Requirements

A feature key must be assigned to Speed Calling on each console which is to have the feature.

A console can have 1 Speed Calling Short List and 1 Speed Calling Long List. A console can also be a user of a long list. Therefore, a console can potentially have access to three lists. Each list must be assigned

its own key. Considering the potential length of the long list, this should suffice.

Although 24 digits may be stored when programming, a maximum of 18 of these will be translated. The rest of the digits will be outpulsed to the distant end.

If a console is a user of a Long List, the console can also have its own individual Long List e.g. a console can have access to 2 long lists, but can only be a controller of 1 of the 2 lists. This is not a console restriction, it is a restriction imposed to allow stations (500/2500 sets) to be users of attendant console Speed Calling lists. In this way console key numbers do not have to be prompted for in the Service Order System. A CONT LEN prompt for 500/2500 sets is sufficient and the feature is uniform, regardless of the controller.

Speed Calling codes, if Short List, are 0 through 9. Long List codes are 00 through 29 if 30 numbers long, 00 through 49 if 50 numbers long and 00 through 69 if 70 numbers long. For Long List numbers assigned to code e.g. 05, 05 must be entered, not just digit 5.

The number of speed call lists available per office to be used by both IBN station sets and attendant consoles is 16384 for short lists, 8192 for long lists of 30 numbers, 4096 for long lists of 50 numbers, and 4096 for long lists of 70 numbers.

Design Considerations

The feature as defined here permits commonality for 500/2500 attendant consoles and proprietary sets. Feature activation/use is common for consoles and the proprietary set.

The feature definition also simplifies the eventual development of Automatic Lines for the proprietary set.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	SERIAL CALL
Feature no	F1177

FEATURE SYNOPSIS

This feature holds a trunk circuit and signals the attendant after a station hangs up from the incoming trunk call and the trunk party is ready to speak with the next desired interval station.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	TRUNK GROUP BUSY INDICATION
Feature no	F1178

DESCRIPTION

This feature permits the display of trunk group status on the attendant console. The lamp state associated with a trunk group will be:

- Off if one or more trunks in the group is idle.
- On if all trunks in the group are busy.

Each trunk group which is to be displayed on the console must be assigned to a key and lamp. Reference V0556 for attendant console assignments.

Not every console needs to have the same trunk group busy display e.g. feature to key assignment is flexible. No console need be assigned this feature. It is optional.

Trunk group busy display will only apply to trunk groups directly terminated on DMS.

The trunk group busy lamp states for each trunk group will be the same for all consoles on which these trunk group busy lamps appear. The lamp states will be updated as trunks in a trunk group are made idle or are seized.

Feature Restrictions

Only the lamps will be functional when assigned to trunk group busy. The associated keys, if depressed, will not affect trunk group availability or call processing. These keys will be used for Attendant Control of Trunk Group Access which is a future feature and will not be available for the Kodak K.

For the Kodak K, only 2 way and one way outgoing trunk groups can be assigned to console feature keys.

Feature Interaction

When Night Service is active and a headset/handset is plugged in, the Trunk Group Busy lamp(s) on that console will reflect the current status of the appropriate trunk group(s) with an appearance on that console.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	MEET-ME CONFERENCE
Feature no	F1181

DESCRIPTION

A STATION, WISHING TO ARRANG A MEET ME CONFERENCE CONSISTING OF 4, 5 OR 6 PARTIES WILL CALL THE ATTENDANT TO RECEIVE A DIRECTORY NUMBER FOR A CONFERENCE BRIDGE IF ONE HAS NOT BEEN PREVIOUSLY ASSIGNED. THE ORIGINATOR MUST TRANSMIT THE DN TO MEMBERS OF THE FUTURE CONFERENCE BEFORE THE REQUIRED DATE AND TIME OF THE MEET ME CONFERENCE. AT THE SPECIFIED TIME, ALL POTENTIAL CONFEREES WILL DIAL THE DIRECTORY NUMBER AND MEET. A DMS STATION OR A TRUNK WITH DISCONNECT SUPERVISION MUST BE FIRST STATION TO ACCESS THE BRIDGE.

AS CONFEREES ARE ADDED, ALL CONFEREES, EXCLUDING THE NEW ARRIVAL, OF THE BRIDGE WILL RECEIVE A CONFIRMATION TONE TO INDICATE THAT A PARTY HAS BEEN ADDED. THIS ALLOWS ANY CONFEREE TO CHECK THE "ROLL CALL" AND ENSURE THAT ONLY DISIRED PARTIES ARE INVOLVED IN THE CONFERENCE CALL AND MAINTAIN AN ORDERLY LIST OF PARTICIPANTS.

AS CONFEREES LEAVE THE BRIDGE, A CONFIRMATION TONE WILL BE RECEIVED BY ALL CONFEREES TO CONFIRM THAT THERE HAS BEEN A CHANGE IN THE NUMBER OF PARTICIPANTS. NOTE: TRUNKS THAT DO NOT RETURN DISCONNECT SUPERVISION ARE EXCLUDED.

UPON DETECTED DISCONNECT OF ANY PARTY, DMS WILL CHECK THAT A DMS STATION IS STILL CONNECTED TO THE CONFERENCE BRIDGE. IF NO DMS STATIONS OR TRUNKS WITH DISCONNECT SUPERVISION ARE CONNECTED, THE CONFERENCE BRIDGE WILL BE RETURNED TO ITS IDLE CONDITION.

LOCKOUT WILL BE ACTIVATED WHEN A DMS STATION FLASHES THE FIRST TIME.

DETAILED FEATURE DESCRIPTION _____

FOR EACH IBN CUSTOMER GROUP, UP TO 16 DIRECTORY NUMBERS MAY BE ASSIGNED FOR MEET-ME CONFERENCES. EACH OF THESE NUMBERS MAY HAVE A CONFERENCE ACTIVE SIMULTANEOUSLY, ASSUMING THAT A SUFFICIENT NUMBER OF 6-PORT CONFERENCE BRIDGES ARE PROVISIONED IN THE OFFICE. ASSOCIATED WITH EACH MEET-ME DIRECTORY NUMBER IS A LINE SCREENING CODE AND A DID FLAG. THE LSC CONFERENCE, AND THE DID FLAG SPECIFIES WHETHER EXTRA-GROUP STATIONS MAY JOIN THE CONFERENCE. WHEN THE FIRST CONFEREE DIALS THE MEET-ME DIRECTORY NUMBER, THE STATION IS CHECKED FOR ELIGIBILITY AGAINST THE CONFERENCE LSC OR DID FLAG. IF THE STATION IS NOT ELIGIBLE TO JOIN THE CONFERENCE, HE RECEIVES BUSY TREATMENT. OTHERWISE A 6-PORT BRIDGE IS REQUESTED; IF NO BRIDGE IS AVAILABLE, THE STATION RECEIVES REORDER TREATMENT. IF A BRIDGE IS OBTAINED, THE STATION IS CONNECTED TO

ONE PORT OF THE BRIDGE; HE NOW HEARS AUDIBLE RING TONE WHICH CONTINUES UNTIL EITHER HE ABANDONS THE CALL OR A SECOND PARTY DIALS INTO THE CONFERENCE.

SUBSEQUENT PARTIES DIALING THE CONFERENCE ARE CONNECTED TO THE BRIDGE PORTS WITH SPEECH CONNECTED. WHEN THE SECOND PARTY JOINS, SUPERVISION IS SENT TO THE FIRST PARTY TO CUT AUDIBLE RING AND CONNECT SPEECH.

IF ALL BRIDGE PORTS ARE OCCUPIED IN THE CONFERENCE, A STATION DIALING INTO THE CONFERENCE WILL RECEIVE BUSY TREATMENT.

ONCE TWO OR MORE PARTIES ARE TALKING ON THE CONFERENCE, THEY MAY LOCK OUT ANY SUBSEQUENT DIAL INS. THIS LOCKING IS DONE AS FOLLOWS: NORMALLY, ONE STATION BECOMES THE MONITOR AND CONDUCTS A ROLL CALL. IF ALL DESIRED PARTIES ARE PRESENT, THE MONITOR CAN LOCK THE CONFERENCE BY FLASHING HIS SWITCH-HOOK. ONCE THE CONFERENCE IS LOCKED, NO FURTHER DIAL INS ARE POSSIBLE; THIS PROVIDES PRIVACY FOR THE CONFEREES.

A STATION DIALING INTO A LOCKED CONFERENCE WILL RECEIVE BUSY TREATMENT.

ONCE TWO OR MORE PARTIES ARE TALKING IN THE CONFERENCE AND THE CONFERENCE IS LOCKED, THIS FEATURE IS IDENTICAL TO AN ATTENDANT-ESTABLISHED CONFERENCE WHICH HAS BEEN RELEASED FROM THE ATTENDANT CONSOLE. THE READER SHOULD THEREFORE CONSULT THE DESIGN SPECIFICATION OF F0367 FOR DETAILS NOT COVERED HEREIN. THIS DOCUMENT COVERS THOSE ASPECTS OF CONFERENCE WHICH ARE UNIQUE TO THE MEET-ME CONFERENCE CALL.

CONFIRMATION TONE

CONFIRMATION TONE IS DEFINED AS A 0.1 SEC BURST AND 0.3 SEC BURST OF 350 HZ + 440 HZ AT AN APPLIED LEVEL OF -13 DBMO SEPARATED BY 100 MS OF NO ZONE.

FEATURE CONSIDERATIONS _____

OWNERSHIP OF SIX PORT CONFERENCE BRIDGE

DMS WILL SUPPORT A POOL OF CONFERENCE BRIDGES WHICH WILL BE USED FOR MEET-ME CONFERENCE, ATTENDANT CONFERENCE AND FUTURE FEATURES USING THE 6-PORT CONFERENCE BRIDGE. ALL CONFERENCE BRIDGES ARE A RESOURCE OF THE SWITCH AND CANNOT BE ASSIGNED TO A CUSTOMER GROUP. HOWEVER, EACH CUSTOMER GROUP WILL OWN 16 MEET ME CONFERENCE DIRECTORY NUMBERS. THIS APPLIES, IN PARTICULAR, TO CLASS 5 OPERATION.

DISCONNECTS _____

WHEN A CONFEREE DISCONNECTS FROM THE BRIDGE, DMS MUST CHECK FOR THE PRESENCE OF DMS STATIONS OR TRUNKS WITH DISCONNECT SUPERVISION ON THE

BRIDGE. IF NO DMS STATION OR TRUNK WITH DISCONNECT SUPERVISION IS A CONFEREE, THE EQUIPMENT NUMBER ASSOCIATED WITH THE DN MUST BE ERASED AND THE CONFERENCE BRIDGE RETURNED TO IDLE.

TRANSMISSION CONSIDERATIONS FOR TRUNKS SEE F0367 "ATTENDANT CONFERENCE".

FEATUE RESTRICTIONS _____

IF THE FIRST CONFEREE IS A TRUNK, THE TRUNK TYPE MUST BE ONE WHICH RETURNS DISCONNECT SUPERVISION (IN PARTICULAR, CANNOT BE 5X25 LOOP). IF SUCH IS THE CASE, THE CALLER RECEIVES REORDER TREATMENT.

ONCE WITHIN A MEET-ME CONFERENCE, NORMAL FLASH FEATURES ARE DISABLED. IF THE CONFERENCE IS UNLOCKED, THE FIRST FLASH BY ANY DMS SERVED CONFEREE IS THE SIGNAL TO LOCK THE CONFERENCE. WITHIN A LOCKED CONFERENCE A FLASH BY ANY PARTY IS AN ATTENDANT RECALL SIGNAL, JUST AS FOR OTHER CONFERENCE CALLS.

WHEN A DMS STATION IS CONNECTED TO A CONFERENCE BRIDGE, THE FOLLOWING FEATURES WILL BE CANCELLED FOR THE DURATION OF THE CALL:

- CALL WAITING
- THREE WAY CALLING
- CALL TRANSFER
- ATTENDANT CAMP ON
- BUSY VERIFY OF LINES AND TRUNKS CONNECTED TO BRIDGE

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	MULTI-CUSTOMER OPERATION
Feature no	F1214

FEATURE SYNOPSIS

A DMS machine equipped with IBN package can cater for more than one customer group. Up to 4095 customer groups can be accommodated by DMS. Within each customer group, 8 sub-groups can be defined. The sub-group is used for departmental or divisional grouping within a company.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	HUNTING	CUSTOMER GROUP CONTR	
Feature no	F1237		

DESCRIPTION

LINE OR STATION HUNTING PROVIDES A MEANS OF SEARCHING A NUMBER OF LINES TO FIND AN IDLE ONE. THIS APPLIES TO A GROUP OF INDIVIDUAL LINES (USUALLY FOR THE SAME SUBSCRIBER) OR TO PBX LINES.

THE TYPES OF HUNTING PROVIDED BY DMS ARE BRIEFLY DESCRIBED BELOW.

DIRECTORY NUMBER HUNTING (DNH) -----

EACH LINE IN THE HUNT GROUP HAS IT'S OWN UNIQUE DIRECTORY NUMBER (DN). THE HUNT GROUP CAN BE ACCESSED BY DIALLING THE MAIN NUMBER (CALLED PILOT DN) OR BY DIALLING THE DN OF ONE OF THE HUNT GROUP MEMBERS. HUNTING STARTS AT THE NUMBER DIALLED. THE NUMBER OF LINES HUNTED TO FIND AN IDLE LINE IS DEPENDENT ON THE HUNTING OPTION ASSIGNED TO THE DNH GROUP.

CIRCULAR HUNTING (CIR) -----

IF OPTION CIR (CIRCULAR HUNTING) IS ASSIGNED TO THE GROUP, ALL LINES IN THE HUNT GROUP WILL BE HUNTED REGARDLESS OF THE START POINT OF HUNTING. IF CIR IS NOT ASSIGNED, THE DEFAULT IS SEQUENTIAL HUNTING (SOMETIMES CALLED LINEAR HUNTING). SEQUENTIAL HUNTING STARTS AT THE NUMBER DIALLED AND ENDS AT THE LAST NUMBER IN THE HUNT GROUP. THEREFORE, IF THE PILOT DN WAS NOT DIALLED, NOT ALL LINES WILL BE HUNTED.

MULTI-LINE HUNTING (MLH) -----

THERE IS ONLY A PILOT DN ASSOCIATED WITH THE HUNT GROUP. TO ACCESS THE GROUP, THE PILOT IS DIALLED. HUNTING STARTS WITH THE PILOT AND ENDS AT THE LAST LINE, IN A SEQUENTIAL FASHION. DISTRIBUTED LINE HUNTING (DLH)

THERE IS ONLY A PILOT DN ASSOCIATED WITH THE HUNT GROUP. TO ACCESS THE GROUP, THE PILOT IS DIALLED. HUNTING ALWAYS STARTS ON THE SUBSEQUENT (IDLE AT THE TIME LAST ONE WAS SELECTED) LINE IN THE GROUP.

DHL IS ASSIGNED TO LARGE HUNT GROUPS WHICH REQUIRE EQUAL DISTRIBUTION OF CALLS.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	SERVICE ORDER SYSTEM
Feature no	F1263

FEATURE SYNOPSIS

Service order system is designed to allow rapid and efficient insertion, deletion and update of data pertaining to IBN lines, IBN directory numbers (i.e., extension or direct inward dial numbers, and directory number access codes).

Service order query system allows the PBX customer to easily and rapidly query (but not alter) the data which is entered via the service order system.

All non-line related data (PBX customer parameters, translation data, station dialled one, two or three digit access code data, and route lists) are modified via DMS table control system.

FEATURE DESCRIPTION

Service orders may be entered into DMS from a service order position, a maintenance position, or in some cases, from a test position (remote service bureau). Queries may be entered from a service order position, maintenance position, test centre position or traffic position. Access to both service orders and queries by the various user classes is customer modifiable on a per-switch basis.

If they wish, service order clerks may enter a service order or query command name after which the system will prompt them for all necessary information to complete the order or query. Experienced clerks may choose instead to enter all the relevant command parameters at once (i.e., at the same time they enter the command name). If a mistake is made, the system will revert to prompting for data following the last correctly entered parameter. For a full description of command entry, refer to NTP 297-2101-310.

Service orders may be entered for immediate activation or activation at a specified later date in which case the system records them in a Pending Order File. For a description of the Pending Order File system, refer to NTP 297-1001-126.

Service order commands exist to do the following:

1. add or delete individual IBN lines or change the line equipment numbers or directory numbers of existing lines
2. add or delete IBN hunt groups or members of existing hunt groups, change the line equipment numbers of existing hunt group members or change the directory numbers of existing hunt group pilots or DNH group members
3. add options to, or delete them from, existing lines or hunt group members or (where a particular option has associated data) change the data value associated with an existing line or hunt group member option
4. suspend service from, or restore it to, an individual line, hunt group or hunt group member
5. change the intercept treatment assigned to suspended line, hunt group or hunt group member
6. add or delete directory number access (DNA) codes.

Where DMS serves as a PBI, LDNs are stored directly against the trunk on which LDN calls are received and hence are entered via table control like all other trunk data.

Data base query commands allow for the rapid and easy interrogation of all IBN data which is entered via service orders (i.e., data on IBN lines and directory number).

References

- DID V0462
- Northern Telecom Practice 297-2001-310

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)		
Feature set	SERVICES		
Feature	ACCESS TO	ETN	
Feature no	F1264		

FEATURE SYNOPSIS

This feature allows the DMS switch to access ATC Electronic Tandem Network (ETN) or NT Electronic Switching Network (ESN). Outgoing trunk groups can be connected directly to the ETN/ESN. The trunk groups can outpulse the authorization code first to the ESN/ETN, before outpulsing the destination number.

FEATURE DESCRIPTION

The customer may specify specific outgoing trunk groups directly connected to the ESN/ETN switch to outdial the user's auth code first. For calls originated from these trunk groups, the ESN/ETN switch will always expect the user's auth code to be dialed first. ESN/ETN will verify the received auth code and return an optional dial tone (system option) if the auth code is valid. The user will then dial the desired destination number as usual. If the received auth code is invalid, ESN/ETN will return re-order tone and the user must re-dial.

This feature will be supported for DTMF sets only. The DTMF station user will go off-hook, receive dial tone from DMS and dial the trunk access code to ESN/ETN. After translation, the user will be connected to the ESN/ETN switch. The user now has a transparent connection (end to end signalling) to the ESN/ETN switch. DMS will collect no more digits. The user will now receive dial tone from the ESN/ETN switch and dial an authorization code via DTMF. If valid, dial tone will be returned to the user and the destination will be dialed. If not valid, re-order tone will be returned to the subscriber who must try again.

Note

A SM DR (station message dial recording) record may be created. However, DMS will be aware of only access code. The called number is unknown to DMS. The trunk signalling between DMS and ESN for this trunk must be DTMF only.

References

DID V058S

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	CALL PARK
Feature no	F1297

FEATURE SYNOPSIS

F1297-Call Park

This feature provides both station and attendant call parking.

The station call park feature allows a station to park one call against its own directory number. The parked call may then be retrieved from any station by dialing a feature code and the DN against which the call is parked.

The attendant call park feature allows an attendant to park calls against any directory number in the attendant's customer group. The parked call may be retrieved from any station by the attendant parking it or by another attendant by dialing the feature access code for retrieval plus the DN against which the call is parked.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	6 PORT CONFERENCE CIRCUIT USE CONTROL
Feature no	F1475

FEATURE DESCRIPTION

This feature gives the capability to TELCO to specify how many 6 port conference circuits can be in use at any given time per customer group.

Once a customer group reaches the maximum limit of 6 port conference circuits permitted at a given time, any new requests will receive the treatment associated with each feature.

DETAILED DESCRIPTION

This feature will permit a customer to specify, on a per customer group basis, the number of 6 port conference circuits which can simultaneously be in use by a specific customer group.

For the purpose of this document, the feature is called CONF6C for conference 6 port count.

The features affected by CONF6C are:

1. Attendant Conference.
2. Meet me conference.
3. V0913 Flexible station controlled conference (500/2500 sets).

The customer will also be able to specify that 6 port conference circuit counting does not apply, per customer group. This can apply where there is only one customer group or where the regulatory environment does not require it.

In table CUSTGRP a new option is added "CONF6C" ,which will give the capability of specifying the number of 6 port conference circuits allowed for each customer group. If this field is not filled, the maximum number of 6 port conference circuits is defaulted to that customer group (eg: for BCS12 this maximum is 2047).

Example in table CUSTGRP:

- * IRVING CONF6C 5
- * HARBOUR CONF6C 8

* NBPOWER (the maximum number is defaulted to that group)

* MARINEAUTH CONF6C 10

FEATURE INTERACTION

If the maximum number of circuits in use has been reached, no request for a conference circuit will be made and the assigned treatment for different features will be given.

No checking will be done between customer group conference allotments and physical provisioning of conference circuits at datafill time. For example, the number of conference circuits allotted to 10 customer groups may be 100, at 10 circuits each. The office may physically be equipped with zero circuits, 50, 100 or 150, etc.

No checking will be done, at the time features are assigned, to determine if sufficient circuits have been provisioned. For example, station users can be assigned, via the service order system, the ability to set up a 6 port or 10 port, etc, conference call. The number of 6 ports to be used at one time by a customer group and the availability of the resource is only determined at call processing time.

This feature does not apply to any POTS 6 port conference capabilities (future features), or AUTOVON Preset conference.

Six port conference circuits are a switch resource. The ability of a customer to specify use of this resource does not imply that a customer group owns those circuits.

FEATURE OPERATION

The purpose of this feature is to equalize availability of 6 port conference circuits to each customer group. This is achieved by assigning a specific number of circuits to each customer group during datafill. Before a request for a 6 port conference circuit a check is made whether the number of circuits used at this time, by the requesting customer group, reached his limit or not. If at that instance the number of 6 port conference circuits has reached the assigned number for that customer group, no request will be made and the assigned treatment for different features will be given. If the number of circuits used is less than the limit, a conference circuit is assigned to that customer group and a count is updated.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	INCREASE IN NUMBER OF CUSTOMER GROUPS
Feature no	F1476

FEATURE DESCRIPTION

This feature increases to 4095 the number of IBN Customer Groups which can be defined with the DMS-100 switch. The limit was previously 128.

This feature does not alter the existing limit on the number of IBN Attendant Consoles, that limit remains 255. In consequence, in an office with the full 4095 customer groups, the vast majority of customer groups would be configured for consoleless operation.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT RELEASE UPON COMPLETION OF DIALING
Feature no	F1477

FUNCTIONAL DESCRIPTION

The Attendant Console Immediate Release feature allows an attendant a call to an IBN or POTS trunks and RELEASE the call after dialling is complete but before outpulsing to the trunk has finished. This capability is not provided for AUTOVON trunks.

BACKGROUND

In the current Attendant Console call processing structure, when the attendant extends a call to a trunk the console is essentially "frozen" until the trunk has answered or until the call fails. In this particular application "outpulsing complete" means that the trunk has been seized, outpulsed, and ANI has been spilled if applicable (in our discussions we will assume that "outpulsing" includes ANI spill where applicable). If the attendant attempts to RELEASE a call extended to a trunk before the trunk has been seized and outpulsing is complete then the depression of that RELEASE key will be ignored. As well, the attendant cannot access another loop during this period of time because this would imply auto-hold. This forces the attendant to wait until all outpulsing is complete.

INTENDED APPLICATION

The time it takes to outpulse to a trunk is dependent on the outpulsing type of the trunk and the number of digits to be outpulsed. For example, a multi-frequency outpulsed trunk will transmit seven digits per second, while a dial-pulse outpulsed trunk will transmit ten pulses per second (it may require many pulses to describe a digit on the latter).

There are other situations in which the time delay can be much greater. Take the example of a call directed at a tie trunk network in which SIMPLIFIED DIALLING applies (reference feature number V0509). In this case there is a delay at each node of the network while waiting for outpulsing to be completed. This may involve several instances of pause insertion (V0509) or tone detection (V0787) or a combination of both. The Attendant Console IMMEDIATE RELEASE feature can improve attendant work time for tie trunk networks and trunks where simplified dialling is used.

It is in cases where the attendant might wish to RELEASE the call so that another call may be handled quickly that this feature would apply. It should be pointed out that although this feature allows the attendant to leave a call before the call is completed, it may not always be desirable for an attendant to do this. For example, it may be the policy of some IBN customers to have the attendant remain with the call until answer has been verified in order to handle any error situations.

FEATURE USE

Datafill

This feature is a datafillable option. The option applies on a customer group basis and may be changed through table CUSTAC (reference BCS13 feature number C0862). To accommodate the IMMEDIATE RELEASE feature a new option labelled **IMMREL** can be added as one of the options permitted for the Attendant Consoles of a particular customer group.

When datafilled with the IMMREL option, every Attendant Console within a given customer group has the ability to RELEASE an IBN or POTS trunk before outpulsing to the trunk is complete. This capability is not provided for AUTOVON trunks.

After the IMMREL option has been applied to a particular customer group through the table editor, the next call extended via an Attendant Console will have the immediate RELEASE capability. A restart is not required to enable this option. Calls in progress at the instant the table is changed will not have the ability to RELEASE immediately.

Actions Without IMMREL datafilled

An attempt to RELEASE a call to an IBN or POTS trunk before outpulsing is completed in a customer group not datafilled with IMMREL is simply ignored.

Actions With IMMREL datafilled

With or without the IMMREL option datafilled, the RELEASE of a call extended to an IBN or POTS trunk will cause the call to be disassociated with the attendant. If the attendant remains active on the loop, the at-

tendant will be aware of failure conditions and can reattempt to extend the call. This is not possible if the attendant releases the call.

When the attendant RELEASES the call, both with and without the IMMREL option datafilled, the call behaves as if the SOURCE party initiated the call directly to the trunk. In this sense the consequences are the same with or without the IMMREL option datafilled.

No Answer Recall

Subject to the restrictions imposed by NO ANSWER RECALL, if the attendant should RELEASE an extended call before outpulsing is complete and the NO ANSWER RECALL option applies, then the recall timer will be started when outpulsing to the trunk is completed (as opposed to when the call is released).

Destination Lamp State

At present the DEST lamp of the current loop turns is lit when outpulsing is complete. This is an indication that the call may be released. With the IMMREL option datafilled, the DEST lamp will be lit before outpulsing is complete. In both cases the call may be released as soon as the DEST lamp comes on.

FEATURE RESTRICTIONS**ATTENDANT ORIGINATIONS**

This feature applies to calls extended via an attendant to POTS and IBN trunks and does not apply to attendant originations. When the attendant presses the RELEASE key during an origination before outpulsing is complete the key is ignored, with or without the IMMREL option datafilled.

With or without the IMMREL option datafilled, if the intent of the attendant is to cancel the call before outpulsing is complete then the RLS SRC key may be pressed. Note that a depression of the RLS SRC key before outpulsing is complete is valid during origination only and is not permitted during the extension of a call.

ATTENDANT CONFERENCE

If the source party on the loop is a conference call, depression of the RELEASE key before outpulsing has completed will be ignored. Immediate RELEASE and conference calling are not compatible.

With the normal RELEASE, both parties must be a conference call for the RELEASE to be ignored.

OTHER AGENT TYPES

This feature applies to calls extended to IBN and POTS trunks only. This feature does not apply to calls extended to AUTOVON interswitch trunks, four-wire subscriber lines, or PBX access lines.

HOLD KEY RESTRICTIONS

The actions of the HOLD key are unaffected by this feature. That is to say, that if the HOLD key is pressed during outpulsing then the key will simply be ignored. As well, the depression of another LOOP key will be ignored during outpulsing because this implies auto-hold.

NO DISCONNECT TRUNKS

If the attendant should extend a call from or to a NO DISCONNECT trunk then the immediate RELEASE option will not be allowed. That is to say that if the source party or the destination party is a NO DISCONNECT trunk then a depression of the RELEASE key before outpulsing is complete will be ignored.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	
Feature	GOC-990 NXX CODE
Feature no	F1480

FUNCTIONAL DESCRIPTION

Feature Background

IBN Translations

The IBNXLA table gives a translation result based on the first digits dialled for a given translator name. However, only one such result can currently be datafilled. Ambiguity in the dialling plan means a different result is desired depending not only on the initial dialled digits, but also on the total number of dialled digits present. Currently, however, only one result per tuple can be datafilled. A method is needed whereby two results can be datafilled; one result leading to the attendant, the other to an intragroup station.

IBN Table Driven Digit Collection

Table DIGCOL is used in IBN software to indicate to the LM (line module) what action to take based on the first digit dialled for a given digit collect table name as specified in either of the two tables, CUSTHEAD or IBNXLA. It allows one to specify short or long timing between digits for a specified number of digits. After this number of digits has been collected, they are reported to the CC (Central Control) and the LM goes into long timing in a collect and report loop one digit at a time. The table also allows one to specify regular POTS digit collection. If a nil digit collect table name is datafilled in table CUSTHEAD or IBNXLA, then digit collection simply becomes a matter of collecting one digit at a time with long timing and reporting each digit individually to the CC. There is no special action taken based on the first digit dialled.

Whenever there is ambiguity in a dialling plan, timing can be used to determine how many digits will actually arrive. Once the least number of digits has been collected to yield one of the two ambiguous results, short timing should ensue since there may or may not be any more digits to follow. Long timing would cause too much of a delay if there really are no more digits.

Feature Requirements

IBN Translations

Once the LM has reported the digits to the CC, the translator will have to decide, upon detecting the digit '0', whether the call is destined for an attendant or an intragroup station (extension number dialling). A new se-

lector, AMBI, will be introduced into the translator table. An AMBI tuple will consist of what currently exists for the ATT and IAGRP selectors combined into one. Translation will, upon reading the table with the ambiguous digit '0', see data for the attendant and for an intragroup station. If a '0' alone is dialled, the translator will route the call to the attendant. If more than one digit is dialled, the call will be considered an intragroup station call.

Digit Collection

The method of collecting the number or numbers which get reported to the CC by the LM must be chosen carefully so that timing on the ambiguous call is done efficiently. To accommodate '0' attendant access dialling, and '0xxxx' extension number dialling for the Government of Canada, digit collection will have to be modified to determine if the digit '0' has been dialled as the first digit and if so, to start short timing. Either a timeout will occur, in which case the translator will route the call to the attendant, or another digit will be collected, indicating extension number dialling. Once a digit has been collected after collecting the '0', a report could be made immediately to the CC or timing could be started to wait for all digits before reporting to the CC, depending on the datafill in table DIGCOL. (See the Data Schema Change section of this document for examples of datafilling table DIGCOL and the effects on digit collection.)

Any digit other than '0' which is to be ambiguous will not be dealt with in any special way in the digit collection algorithm. Datafill in table DIGCOL will be the only way of forcing short timing between the maximum number of digits required for one result and the minimum number of digits required for a second result. Yet, once past the digit collection phase, the translator treats an ambiguous digit or digits in the same manner as an ambiguous '0'. (See the Data Schema Change section for differences between datafilling the digit '0' and any other digit in table DIGCOL.)

Customer Group Option

Whether or not the digit collection algorithm will short time after collecting the digit '0' will depend on a customer group station option to be introduced into table CUSTSTN. AMBZERO will become a valid customer group station option. If such an option is datafilled and the digit collection table specifies long timing, then the LM will check to see if the first digit dialled is a '0'. If it is, then short timing will be started for one digit. If AMBZERO is not datafilled, then the check for '0' is not made, and short timing will not be started.

Making this feature an option on a customer group basis allows only those customers with the ambiguous digit '0' to short time after dialling the digit. Those customers who datafill '0' in table DIGCOL as long timing and want '0' only for extension numbers and not attendant access, will be able to long time between all the digits of the extension number if they do not set this option.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	TGB/TAC ACCESS THRU SPECIAL KEY
Feature no	F1604

FEATURE SYNOPSIS

The current Trunk Group Busy (TGB) and Trunk Access Control features require one key each on the attendant console for each trunk group. In offices with a large number of trunk groups (e.g. 50) the large number of keys would not fit on the attendant console.

This feature provides two new keys Group Trunk Group Busy (GTGB). These keys give the attendant the ability to access a particular trunk group to monitor its busy/idle status or to control access to that group. To select a particular trunk group the attendant will press the required key (GTGB or GTAC) and then enter the required trunk group number.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	WILDCARD KEY
Feature no	F1605

FEATURE SYNOPSIS

At present an attendant can access/use/program a feature if a key is assigned to the feature on the console. Since there are 42 assignable keys (14 on basic console, 28 in add-in module) for both ICI and features on the console additional keys may be required.

An attendant can use the wild card key (WC) to request special features not available on a feature key.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	MAP DISPLAY FOR ATTENDANT OM
Feature no	F1606

FEATURE SYNOPSIS

This feature displays on the MAP, subgroup Attendant Console Operational Measurements in a customer group.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	PERMANENT HOLD
Feature no	F1639

FEATURE DESCRIPTION

The permanent hold feature allows a station with a 500/2500 set to hold one active call against its own directory number without attendant assistance. The held call may then be retrieved from this same station.

Feature Inclusion -----

This feature will be applied on a per line basis. Permanent hold will be an optional IBN station feature.

Feature Use -----

Station A is assigned the permanent hold feature and calls station B. During the conversation, A wishes to refer to a document which is not currently within reach.

A flashes, hears special dial-tone and dials the permanent hold feature code. A hears confirmation tone indicating B is being held. B hears silence. A can go on-hook and later retrieve B by going off-hook at which time the 2-port connection is reestablished.

Feature Tones -----

Confirmation tone will tell A that the request for the permanent hold feature has been accepted by DMS-100 and that B has been put on permanent hold. Confirmation tone is 350 + 440 Hz at -13 dBm and is provided by the line module. Its cadence is 100 msec ON, 100 msec OFF, 300 msec ON, then OFF.

Reorder tone will tell A that the request for the feature cannot currently be accommodated by DMS-100 and the two-port connection between A and B will be reestablished. See "Feature Activation" section.

An optional reminder ring will be heard by A at timed intervals. The length of the timed intervals is flexible at the customer group level from 12 seconds to 1023 seconds in 1 second time ticks. The reminder ring will consist of a 500 msec ring splash to the onhook party who activated the permanent hold feature.

Receiver off-hook (ROH) tone will be applied to A's set if A remains off-hook after putting B on permanent hold and the recall timer (if applicable) expires. See "Feature Activation" section.

Feature Requirements -----

A new timer will be required. It will be referred to as the call-hold-timer for the purpose of this DID. At the customer group level, one of two options can be selected.

1. The customer may choose to have the station that invoked the permanent hold feature reminded of the held call periodically.
2. The customer may choose to have the held party recall the station that invoked the permanent hold feature after a certain amount of time has expired.

The call-hold-timer will therefore serve a dual purpose. Should the customer choose option 1 above, then the call-hold-timer will be used to time the intervals between the reminder rings. The length of the time interval between reminder rings is defined at the customer group level from 12 seconds to 1023 seconds in 1 second time ticks. Upon expiry of the call-hold-timer, a reminder ring is sent to the on-hook station that invoked the permanent hold feature. The call-hold-timer is reset and once again, upon expiry, the reminder ring is sent. This continues until the held party is retrieved.

Should the customer choose option 2 above, then the call-hold-timer will be used as a recall timer. The recall will be defined at the customer group level and can be set from 12 seconds to 1023 seconds in 1 second time ticks. Upon expiry of the call-hold-timer, in this case, the held party rings the station that invoked the permanent hold feature.

Should the customer not specify which timer is to be used, then the call-hold-timer will be used as a recall timer, with recall occurring 60 seconds after B has been put on permanent hold.

The customer group must assign a feature code to the permanent hold feature.

If A goes on-hook after placing B on hold, a disconnect will not be processed. Therefore, billing (SMDR, LAMA, CAMA) will not be affected. Billing continues for the duration that B is held and upon recall, until ringing timeout occurs.

Feature Activation -----

A has the permanent hold feature. A and B are involved in a two-port call. A flashes. (Refer to FIGURE 1)

Should there be insufficient resources for DMS-100 to allow the feature, A will receive reorder tone, then be reconnected to the two-port call with B. Otherwise, A will receive special dial-tone. A dials the feature code for the permanent hold feature indicating a desire to put B on hold. If the feature code is valid, A will receive confirmation tone indicating that B is on permanent hold. B will hear silence until retrieved by A or until recall occurs (if applicable). If A dialed an invalid feature code, then A will receive reorder tone, then be reconnected to the two-port call with B.

A can go on-hook and B is on hold. The customer group can specify which of the options is to occur.

1. A reminder ring will be heard by A at timed intervals. The length of the timed intervals is flexible at the customer group level from 12 seconds to 1023 seconds in 1 second time ticks. The reminder ring continues until A has retrieved the held call.
2. A recall timer can be defined at the customer group level and can be set from 12 seconds to 1023 seconds in 1 second time ticks. When the timer expires, the held party, ie. B, will ring A (recall). When B recalls A, B will hear audible ringing.

If A remains off-hook, then

1. Reminder ring (if applicable) does not apply.
2. If the recall timer (if applicable) expires, receiver off-hook (ROH) tone will be sent to A; if A then goes on-hook, recall will occur, ie. B will ring A.

To retrieve the held call, A must go on-hook and then off-hook again.

Feature Deactivation -----

The permanent hold feature will be deactivated if any of the following occur:

1. B goes on-hook. This will result in termination of the two-port call between A and B. If A is off-hook, then A will go into lockout.
2. The customer has chosen to have a recall timer and the recall timer expires before A retrieves B. This will

cause B to ring A's set, if A is on-hook. If A is off-hook, A will receive ROH.

3. A goes off-hook. This retrieves B and thereby reestablishes the two-port connection.

Service Order System -----

The permanent hold feature will be assigned to and deleted from lines via the Service Order System. The Permanent Hold feature acronym for Service Order input will be HLD.

Feature Interactions -----

1. While the permanent hold feature is active on A's set, no subsequent calls can be originated or terminated on the set. While B is being held, no subsequent calls can be originated or terminated at that station. An incoming call to either station involved in a call where the permanent hold feature has been invoked will receive busy tone. This assumes that both A and B are served by the same DMS-100.
2. While the permanent hold feature is active on A's set, no other features can be activated from the set. While B is being held, B cannot activate any other features. This assumes that both A and B are served by the same DMS-100.
3. After activating the permanent hold feature, if A remains off-hook, the reminder ring will not be heard by A nor will a recall occur, no matter what option the customer has specified. A will not go into Lockout.
4. The permanent hold feature can be activated only when a call is in the talking state.
5. Permanent hold cannot be assigned to an automatic line (AUL).
6. If the calling line identification with flash feature has been activated, then the permanent hold feature will be temporarily suspended.
7. The permanent hold feature cannot be activated from any station involved in a three-way call since all flash-related features are suppressed while the conference circuit is allocated.
8. If station A has the call waiting feature or the attendant camp-on feature and a call is camped-on or waiting, then flash by A will connect A to the call waiting or camped-on call. Subsequent switchhook flashes allow A to alternate between the original party and the waiting or camped-on call. The permanent hold feature is suspended while station

- A has activated the call waiting or camped-on call feature.
9. The permanent hold feature cannot be used to put the attendant on hold. If the original leg of the call was completed by the attendant and the party has answered, then the following may have occurred:
 - i) the attendant released the call and therefore the permanent hold feature may be invoked.
 - ii) the attendant held the call and a flash by either party recalls the attendant; the permanent hold feature is disabled in this case.
 10. While the party is in the hold state or is holding a party, calls are not allowed to terminate on either station. This includes call waiting and attendant camp on.
 11. While a station A is holding a station B, A cannot be Busy Verified. While B is being held, the attendant cannot Busy Verify B.
 12. A station can be assigned both the Call Park and the Permanent Hold features. In this case, the station can choose which feature to invoke.
 13. If station B abandons the call while being held, the call-hold-timer is cancelled. Reminder ring to station A (if applicable) stops. Recall (if applicable) will not occur.
 14. Permanent hold cannot be invoked while A is involved in a Meet Me Conference, in a station Established Conference or in an Attendant Set Up Conference.
 15. Do Not Disturb has no effect on A's ability to invoke Permanent Hold. Specifically, Do Not Disturb does not affect B's recall to A.
 16. While A has a call on permanent hold, a call directed to A by any means will receive busy tone unless A has the Call Forward Busy feature. In this case, the call will attempt to follow the Call Forward Busy feature. The same will apply to B while B is held by A.
 17. Speed calling can be used to activate Permanent Hold.
 18. The ring splash to be used as a reminder ring is applicable to all ringing plans (Bell Canada, Frequency, Superimposed).
 19. If a station A has invoked the permanent hold feature, then only A can retrieve the party being held. When the held

party recalls A (if applicable), then another station in A's Call Pickup group can dial the CPU code and retrieve the call. If station A has chosen to have reminder ringing (500 msec ring splash), then the call can not be picked up by another station in A's call pickup group because the call is not physically connected to A's set.

20. If station A has the call forward feature activated and the recall timer (if applicable) expires, B will not be forwarded via the CFD feature when B recalls A.
21. While the permanent hold feature is active, a third party cannot invoke the Executive Busy Override feature to interrupt the call between A and B.
22. NCT (no call transfer except to the attendant) is incompatible with the permanent hold feature. In a normal two-port call, if A flashes and has the NCT feature, then A will be immediately transferred to the attendant.
23. A party will not be able to invoke the permanent hold feature if the incoming call involves a no disconnect trunk. When the party flashes, a call involving a no disconnect trunk is transferred immediately to the attendant.

Operational Measurements -----

The following operational measurements will be recorded:

1. on a customer group basis:
 - a) the number of calls successfully held.
 - b) the number of held calls that abandon.
 - c) the number of held calls that recalled (if the customer has selected the recall option). This is pegged when the recall timer expires. Therefore, the peg count will include the two cases which may occur upon expiry of the recall timer :
 - i) A is on-hook, B can ring A.
 - ii) A is off-hook, A receives ROH tone.
2. on a system wide basis:
 - a) the number of calls that could not be held due to a lack of resources.

These operational measurements will help determine the success ratio for holding calls and an appropriate setting for the recall timer for the customer group.

Note: -----

Since it was requested that the permanent hold feature for IBN (500/2500 sets) be based on this same feature for SL-1, make note of essential differences.

1. For DMS-100 permanent hold feature, a confirmation tone shall be provided when the feature request has been accepted by DMS-100.
2. On DMS-100, the customer group has the option of having a recall timer which upon expiry causes the held party to recall the party that activated the permanent hold feature. If the recall timer expires and the party that activated the permanent hold feature is off-hook, then this party will receive ROH tone.
3. Currently, on DMS-100, a switchhook flash from a party on hold has no effect. Therefore, we will not allow the party on hold to, in turn, invoke the permanent hold feature, as is allowed on SL-1.
4. Because there is a limit as to how many sets can be rung at the same time by a line module, queuing can cause delays in ringing. For this reason, DMS-100 provides a 500 msec ring splash as a reminder ring as opposed to a 1 second burst of ringing every 60 seconds as on SL-1. On DMS-100, the length of the time interval between reminder rings is flexible at the customer group level from 12 seconds to 1023 seconds in 1 second time ticks.

Revision History -----

Aug. 13/82 revision due to DID review reflects the following:

- removal of restriction that A must have 3WC or CT ALL to enable use of the permanent hold feature.
- limits specified for the timers.
- discuss LAMA, CAMA, SMDR implications.
- discuss use of ROH tone.

Oct. 28/82 revision

- update the status of the document to completed.

Nov. 9/82 revision

- remove the time limit for reorder tone.

Estimated Storage Requirements: -----

PROGRAM STORE - Fixed:	<1	K-bytes		-Estimates
DATA STORE - Fixed:	<1	K-words-		

- Engineerable: (formula)
- Dynamic: Yes/No

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	STATION CONTROLLED CONFERENCE (MAX 6 PORTS)
Feature no	F1640

See feature F1633

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	TONE DETECTION
Feature no	F1744

Feature Background: In a Tandem Tie Trunk Network (without DMS), tones are returned to the dialing subscriber to indicate the progress of the call through the network. As each tone is returned to the subscriber, the person may continue dialing or abandon. Because the switch is in the dial repeating mode, each digit dialed is outputted immediately.

A Tandem Tie Trunk Network (TTN) forces a subscriber to

- * know the position of his switch in the network,
- * learn a lot of access codes for point to point steering through the network, and
- * know when to wait at appropriate times for call progress tones from the far end.

In a senderized switch such as DMS, the subscriber no longer hears dial tone that relates to the steering through the network.

* Digits dialed and digits outputted are totally independent, i.e., all digits are dialed before a trunk is seized.

* Dial tone between access codes is non-optional. Dial tone is used to enforce old dialing habits, i.e., the subscriber is given dial tone because he has always heard dial tone at this point in the dialing sequence in the past. Alternatively, a Uniform Dial Plan may be adopted.

* Outputting in DMS must be datafilled to insert pauses or look for tones at appropriate places where digits are being outputted to a TTN or to access a Specialized Common Carrier (SCC).

Datafill of the outputting sequence is necessary because DMS does not at present support Cut Through Dialing - see Simplified Dialing (V0509).

DESCRIPTION:

This DID describes the needs for tone detection while outpulsing in IBN.

Tone detection, specifically call progress tone detection, is required in several situations. It is used to detect dial tone as a means to control outpulsing of digits. It is also used to detect call blocking, high and dry states, and to provide answer supervision. (as described in V0788)

Another requirement for tone detection now exists in the IBN environment. This is for the access to SCC via the public network. Specifically, IBN must know when the SCC switch is ready to receive digits. This can be accomplished by detecting SCC dial tone, after dialing the public network number for the SCC. It is also desirable to detect some public network call progress tones to allow DMS to alternate route the call if the SCC is unavailable.

Tone detection is required in a network because machine recognizable "proceed to send" signals are not returned from the far end on a link.

ACCESS TO TANDEM TIE TRUNK NETWORKS:

A major application for tone detection exists in tandem tie trunk networks. In setting up calls through a TTTN, where cut through operation is required, the tone detector would be used to improve call setup reliability by detecting the returned tone from the far end trunk in the chain. As soon as tone is detected (assuming it is dial tone), DMS will continue to outpulse digits. It will no longer be necessary to insert pauses into the outpulsing string where dial tone is expected. In addition to detecting tones for start-dial indication, it shall also be possible to detect trunk blocking at tandem switches to allow alternate routing of calls.

Note: the dial tone returned should be precise as defined by frequency to increase detection accuracy. Detection of non-precise tone is allowed at a lower detection accuracy.

The tone detector shall operate in two modes. In the TTTN scenario, it is desirable to recognize all tones being returned from the far end. Therefore, the tone detector shall report all tones returned from the far end. In this case, the tone detector and the software driving it will be able to detect 'continue' conditions, e.g., dial tone received from the far end indicates that outpulsing may continue, and 'fail' conditions, e.g., silent, busy or reorder tone returned from the far end in which case, DMS can alternate route the call.

Note: For the "fail" condition, this trunk group will not be eligible for Network Queuing.

Note: For Tone Detection, only the North American Tone Plan is supported.

The tone detector can be used in private networks for the automatic completion of calls over TTTNs. This enhances the insertion of pauses in the outpulsing string by

* waiting for dial tone. In cases where dial tone is slow in being returned from the far end, a pause only would lead to outpulsing before the far end was ready. The use of the ATD will increase the call setup reliability,

Note: If the Audio Tone Detector (ATD) is specified for a trunk which is not engineered to return dial tone, then the call setup time will increase. If dial tone is expected and timeout occurs, then alternate routing can occur. It is recommended that a tone detector not be designated if dial tone is not provided from that end point.

* immediately resuming the outpulsing of digits when dial tone is detected. This will cause the call setup time to decrease and consequently the post dial delay to the subscriber will be shorter. and

* detecting busy/reorder tone being returned from various tandem points in which case the call can be alternate routed.

The access method, from a PBX with Cut Through operation, to a TTTN traditionally would be as follows:

1. the subscriber dials the first access code to get to node B, e.g., digit 8,
2. a trunk to node B is seized and the switch now operates in the Cut Through mode,
3. the subscriber waits for dial tone to be returned from the far end,
4. the subscriber dials the second access code to reach node C, e.g., digits 144, which are outpulsed one by one to node B,

Note: In a computer controlled switch, each digit dialed is a message to the computer and each digit outpulsed is a message from the computer for Cut Through operation.

5. dial tone is returned to the subscriber if a trunk from B to C is available, otherwise reorder is returned and the subscriber must try later,

6. the subscriber dials the extension number of the person desired on node C,

7. the subscriber hears audible ringback if the node C extension is idle, otherwise, the subscriber will hear busy tone.

With DMS, this process can be programmed into the switch so that the subscriber does not know what digits are being outpulsed. DMS interface to the tie trunk network works as follows:

1. the subscriber dials the access code for access to the 'private' network e.g., digit 8, (used for convenience, does not necessarily correspond to the above example) followed by the destination code of node C, e.g., digits 236, followed by the called party's extension.

2. DMS seizes a trunk to node B,

3. waits for start-dial signal from node B if electrical, otherwise, an ATD is attached to the trunk to detect dial tone,

Note: standard signaling (immediate dial, delay dial or wink) may be used between nodes A and B or the ATD (Audio Tone Detector) can be attached to the trunk to detect dial tone.

4. when start-dial is received, the access code from node B to node C will be outpulsed, i.e., digits 144,

5. the ATD is used again to detect dial tone returned from node C,

6. if dial tone is detected, the extension digits are outpulsed, otherwise, silent, busy or reorder tone may be detected and alternate routing can proceed. If there are no trunks on which to alternate route, the trunk will be dropped and the subscriber will hear reorder tone from DMS. This acts to shorten the holding times of the tie trunks.

7. if the called party's line is idle, then the subscriber will hear audible ringback, otherwise, the subscriber will hear busy tone.

SCC ACCESS VIA THE PUBLIC NETWORK:

Several major SCCs are presently operating in the U.S. These include MCI, SBS, SPC, ITT, U.S. Tel, and COMNET. There are also plans for future expansion into the Canadian market.

The main intent of the tone detector is the detection of call progress tones, both in the public and private networks. In particular, on calls to SCC's the tone detector must detect SCC dial tone as a start-dial indication to DMS to outpulse an authorization code, a destination DN and pos-

sibly an account code. Further, the tone detector shall detect network and station busy tones. This capability is useful in situations where an alternate route can be selected when a particular route is unavailable.

In the SCC scenario, when access to the SCC is via the public network, audible ringback is returned to the tone detector until the SCC 'answers', i.e., a digitone receiver is connected to the SCC trunk. Upon SCC answer, SCC dial tone is returned to the tone detector and an authorization code is outpulsed followed by the destination DN and possibly an account code. In this case, the tone detector must be instructed to 'look' for a particular tone, i.e., SCC dial tone.

Access to the SCC network may be provided to IBN customers as one of several routing alternatives. In this case, the subscriber is not expected to know how to access the SCC directly. Therefore, DMS must be able to outpulse authorization codes, account codes and destination numbers automatically as required. This flexibility is included in the digit manipulation data.

The access method, from a PBX with Cut Through Operation, for all these networks is similar and proceeds as follows:

1. The subscriber accesses a CO trunk and dials the seven digit number for the SCC.
2. The local CO connects the PBX subscriber to the SCC if a line is available. Audible ringback will be heard by the PBX subscriber. Otherwise, busy tone will be returned from the CO.
3. The SCC switch answers the call and SCC dial tone is returned to the subscriber. The SCC is now ready to receive digits in DTMF.
4. The subscriber dials an authorization code followed by the ten-digit public network DN. (Note: For some SCCs, the subscriber first enters the ten-digit destination DN, and upon hearing a prompting tone from the SCC enters the authorization code.)
5. The call is routed through the SCC network, where it may be blocked (overflow tone is returned). Otherwise, the call is terminated on the destination set. At this point, either audible ringback or station busy tone may be returned.

With DMS, this process can be programmed into the switch so that the subscriber is unaware that access to SCC is provided. The SCC would appear as a route list element with operation as follows:

1. The subscriber dials access to his private network followed by a ten-digit destination public network number. Translation datafill leads to a route with a digit manipulation index (DMI). This leads to seizure of a trunk to the CO (Note: the same trunk as seized above) and the seven digit number for the SCC is outpulsed. The tone detector is connected.

2. If access to the SCC is available, audible ringback is returned. Otherwise, busy tone is received by the tone detector and alternate routing proceeds.

3. When the SCC answers, SCC dial tone is returned, the tone detector reports dial tone and DMS will output the authorization code stored in the DMI followed by the ten-digit public network code dialed by the subscriber.

4. Outpulsing is now completed and the subscriber is connected to the trunk.

5. If answer detection is required by the ATD, then answer will be detected as described in V0788.

CONNECTION OF THE AUDIO TONE DETECTOR

When Digit Manipulation is used on a call, the originator will not hear any tones returned from the far end. If tone detection is required during the outpulsing phase of the call, then a tone detector will be connected to the trunk in a listen only configuration.

The originator can hear tones from the far end only when all digits have been outpulsed. At this point tone detection may still be active on the call, for example, in the case when the tone detector is being used for voice answer detection.

The tone detector is treated as an 'ear' in the call and will not disturb the configuration of the call. It will operate in a listen only mode and cause the call to progress to the talk state.

Therefore, for example, if the tone detector detects busy tone from the far end, a decision of rerouting is based on whether the originator can hear the busy tone from the far end. If the tone detector has detected busy tone from a tandem point, then the call is eligible for automatic alternate routing. If busy tone is detected at the end of outpulsing, this means that the terminating station is busy. The call is essentially finished because the originator has not reached his desired terminator.

If busy tone means station busy, then the detection of busy tone will interact with three way calling (see feature interaction).

AUDIO TONE DETECTION**DEFINITION OF TONES:**

Precise Dial Tone: frequency - 350/440 hz
cadence - continuous

Other Dial Tone: frequency - 400 hz
cadence - continuous

SCC Dial Tone: frequency - Precise, Other Dial Tone or other
tones depending on the switch
manufacturer
cadence - continuous

Non Precise Dial Tone: frequency - various frequencies depending
on the switch vintage
cadence - continuous

Precise busy/reorder tone frequency - 480/620 hz

Non precise busy/reorder tone frequency - various other frequencies
depending on the switch vintage

Busy Tone (60 IPM): cadence - 1/2 sec tone on, 1/2 sec tone off,
repeated

Reorder Tone (120 IPM): cadence - 1/4 sec tone on, 1/4 sec tone off,
repeated

Audible Ringback Tone: frequency - 440/480 hz
- various other frequencies depend-
ing on the switch vintage
cadence - 2 sec on, 4 sec off repeated
- various other cadences depending
on the switch vintage

Voice: frequency - various combinations
cadence - various combinations

A comprehensive list of ATD tones and the algorithm for detection can be found in V1009 - ATD tone detection execs and templates.

DETECTION OF TONES

The preferred solution is to provide automatic detection of dial tone. In principle this would be straight forward, if all PBX equipment returned precise dial tone, as specified in RS-464. Unfortunately, many existing PBXs return non-precise dial tone. Customers must know their network and consequently when dial tone detection can be done.

The tone detector will detect precise and non-precise tones. The tone detector uses a combination of frequency and cadence to determine the type of tone returned from the far end.

Three components on DMS are necessary to do intelligent tone detection in DMS:

1. 5X29AC - the tone detector card which is attached to the call and listens to the tone returned from the far end. The card will do on-board processing to determine the type of tone from the far end.

Note: The large number of non-precise tones in the North American network require further screening for type of tone.

2. MTM - a special exec lineup is required on an MTM where the 5X29AC card resides. The peripheral software is used to determine the cadence of the tone from the far end. This information combined with the hardware detected code yield a tone result that is sent to the Central Controller.

3. CCC - the information necessary to drive the tone detector resides in the CC datafill of table DIGMAN. By using the commands in the Digit Manipulation table, the customer can customize the use of the tone detector for different applications. In addition, it is the CC where the audio tone detector messages are processed and the direction of the call is determined.

There are different modes of operation that the ATD can operate as datafilled in table DIGMAN:

1. ATD GLARE - look for dial tone

The purpose of this command is to look for dial tone when the trunk is initially seized, i.e. for glare resolution. No other tone can possibly be received during this interval.

The nominal detection time is 1 second from receipt of tone. This is done to reduce post dial delay.

2. ATD DT - look for dial tone

The purpose of this command is to detect subsequent dial tones on a tandem tie trunk network.

Dial tone is considered to have a tone cadence of longer than 3.5 seconds.

If busy or reorder tone or timeout occur, then this will be considered as a fail condition and alternate routing can occur.

During this phase, audible ring can not be detected. This is done to reduce post dial delay.

If any dial tone is detected, then this is interpreted to mean continue outpulsing.

3. ATD AR - look for audible ringing and wait for dial tone or voice

The purpose of this command is for interfacing to a Specialized Common Carrier (SCC) or Direct Inward System Access (DISA) switch.

Ringing is detected but ignored because the call is in a waiting state. For DISA or SCC access, the far end will answer the call and return dial tone. When dial tone is detected, the call can continue to outpulse digits.

The nominal time to detect dial tone or voice is 7 seconds.

If reorder or busy tone or timeout is detected, then this will be considered as a fail condition and alternate routing can occur.

ALTERNATE ROUTE DENY

If in routing the call, for example via tie trunk facilities and the tone detector encounters busy/reorder tone from an intermediate switch to indicate network blocking or all trunks busy, then the originator will be alternate routed to the next element in the route list.

If the next element in the route list contains a common node beyond which busy/reorder tone was encountered, then alternate routing of the call should be denied.

This can be done by using the digit manipulation command 'ARDENY'.

If this command is used in the DMI, then if the command is encountered in the decoding of the DMI, then the originator will be routed to treatment.

The ARDENY command must be placed directly before the first ATD or ANS command where alternate routing is to be denied. Only one command need be used per DMI.

These parameters are datafilled in table IBNATD. They include:

1. High and dry timeout - this parameter is specified in seconds and is used to determine that the call has reached a 'dead end'. Translation and routing at some other switch has been disrupted for an abnormal reason. Users of tie trunks encounter this once in a while and have learned to 'diagnose' such problems when dialing. The default value of this parameter is 6.4 seconds.

2. Number of ring cycles - this parameter is specified in number of cycles and it determines the number of ring cycles to detect before a timeout or 'no answer' condition exists. The default value is 10 rings. This parameter affects the holding time of the ATD.

3. Atd deaf time - this parameter is used to mask off outpulsing noise returned from far end switches. This noise has been found to exhibit itself as 'crashes or glitches' to the originator. The tone detector treats these noises as a 'pseudo conversation' and thus gets fooled into thinking that the call has been answered. Measurements from the field have shown that this outpulsing noise can be as long as '20 seconds' in the DDD network!

When outpulsing is complete, the tone detector immediately starts listening for the specified tone. If outpulsing noise is encountered on that link, then the atd deaf time should be used to stop the tone detector from listening to the far end for the specified interval.

The default value for this parameter is 0 seconds. Typically, outpulsing noise is not heard by the originator.

4. Equate voice to tone - the tone detector tries to differentiate between voice and dial tone based on frequency and cadence parameters. If the customer wishes to provide a distinction between voice and dial tone for specific applications, then this parameter should be set to NO. The default value for this parameter is YES.

5. Default answer desired - this parameter is described in V0788 - Answer Supervision Generation.

The parameters described here are also applicable to V0788 - Answer Supervision Generation.

The parameters specified in the IBNATD table are set up with defaults such that probably 99.999⁴ of all calls will not need to use this table. The parameters are only necessary when a special problem involving tone detection applies. The IBNATD table can be used to solve these problems.

LOGS

Logs will be available for the ATD for failure cases.

1. IBNATD not available - an audio tone detector is not available at this time for the call to continue.
2. Table IBNATD datafill problem - The index specified in the DMI for table IBNATD is not datafilled.
3. Alternate routing denied by the ATD - if busy/reorder is detected by the tone detector and the alternate route deny command has been reached in the outpulsing file, then the call is ineligible for alternate routing.
4. Timeout encountered on route by the atd - this log is printed when high and dry timeout is encountered on the route.
5. Three way calling denied by atd - this log is printed each time the originator flashes to invoke a three way call and this specialized outpulsing is being done. It is of significance when busy/reorder is detected and the originator is disallowed three way calling because of the detected condition is busy tone.

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)

Feature set	ATTENDANT FEATURES
Feature	ATTENDANT CONSOLE DISPLAY (ENHANCEMENT II)
Feature no	F1783

FUNCTIONAL DESCRIPTION

1. Introduction

The key lamp display (KLD) unit is an extension of the existing IBN attendant console. It consists of a 16 character alphanumeric display, 28 LEDs, and a 28 button keyboard. This document describes the enhancement 2 package which is intended for Scopedia release 3. A description of the complete attendant console display package is included in DID V0592 and an enhancement 1 description in DID V0608.

To obtain the full terminating phase display, the display control key should be assigned to the console (ref. V0608).

The terminating phase of a call is when the DMS completes processing of digits keyed in by the attendant. This could be for attendant originated or extended calls as well as keying during feature operation. The result of digit processing is either a successfully completed call or some kind of audible treatment. For the KLD enhancement 2, both D1 and D2 displays will be used to provide digit/treatment information and the display control key can then be used to switch between them. Digit information will always be displayed in D1 (with the display control lamp off) and treatment information will be in D2 (with the display control lamp on).

1.1 Successfully completed calls

For calls that are successfully terminated on a line, a trunk or an attendant, where call forward activity is not involved, the display remains unchanged showing the dialed digits. If call forwarding has occurred, the following format is displayed:

```

-----
| C F   d d d d d d d d d d d d d |
-----

```

Where d...d are the 13 least significant digits of the party on whom the attendant has terminated. If there are less than 13 digits in the number they will be left-justified in the field.

The display will be the same for any type of call forwarding. If call forward don't answer occurs, the display will be updated at that time to show the new party's digits. If any subsequent call forward don't answer occurs, the display will be updated again. If a chain of call forwards occurs, only the digits of the final terminating party will appear. If

the call is forwarded after entering a distant switch, that forwarding information will not be available for display.

Note that this digit display is in D1. Since there is no treatment in these cases, D2 remains blank although for consistency, the attendant may still use the display control key (if assigned) to switch between the displays.

The following is an example of how successful termination would appear to the attendant with both normal and call forward displays. D2 will be blank in each of these cases. Note that in this example the attendant is originating and that she does not release the loop until all forwarding is completed. If the loop were released, the display would be cleared (ref. V0592 sec. 8).

Suppose : Stn A has CFD to stn B
 Stn B has CFU to stn C
 Stn C has CFB to stn D
 Stn D has CFD to stn E
 Stn E has CFU to stn F
 All stations are in the same customer group.

- The attendant (AC) dials stn A and terminates successfully.
 The D1 display is frozen to show

```
-----
| < digits dialed (A's) > |
-----
```

- A fails to answer.
 AC is forwarded to stn B.
 AC is automatically forwarded to stn C.
 C is busy.
 AC is forwarded to stn D and terminates successfully.
 The D1 display is updated to show

```
-----
| C F < digits of D > |
-----
```

- D fails to answer.
 AC is forwarded to stn E.
 AC is automatically forwarded to stn F and
 terminates successfully.
 The D1 display is updated to show

```
-----
| C F < digits of F > |
-----
```


1.2 Completed calls which receive treatment

In cases where a call does not terminate successfully and the DMS returns audible treatment to the attendant, a suitable message will be made available for the display in D2. The digits display in D1 will be formatted the same way as for successfully completed calls (ref. sec. 1.1).

Assuming the display control key has been assigned, the treatment message in D2 will be output on the display with the display lamp turned on to indicate that D2 is being shown. The digits display is in D1 and can be obtained by hitting the display control key, at which time the display lamp will be extinguished.

If the display control key has not been assigned, the treatment message will not appear (as it is in D2) and the digits dialed will remain on the display.

If audible treatment is returned from a distant switch, no treatment message will be given and the display will appear as discussed in sec. 1.1.

Audible treatment which is given in response to keying errors other than digit keying will not cause a treatment message on the display unless done so by a feature. This allows the previous display (e.g. call presentation) to remain and also allows the display control key to remain in use if it had been so previously.

The actual format of the treatment message will depend on whether or not call forwarding has occurred. It will be either:

```

-----
| cccccccccccc|          with no call forwarding
-----
    
```

OR

```

-----
|CF cccccccccccc|          with call forwarding
-----
    
```

where cccccccccccc represents the 13 character treatment message itself.

The following list maps the treatment messages which will be seen on the display to their corresponding treatment codes as defined for use in the treatment tables (see ref. 3). These treatment messages are not datafillable. More treatment messages can be added as required.

- TRY AGAIN - rodr, syfl (errors beyond the attendant's control)
- ALL CKTS BUSY - nosc, ncrt, ncot, gnct, sord (hw/sw resource)

	unavail or rte exhaust)
NETWORK BLOCK	- nblh, nbln
DEFLECTED	- emr1, emr2, emr3, emr4
INTERCEPTED	- anct, oprt, trbl, atbs, mhld
UNASSIGNED DN	- bldn, undn
BUSY	- busy (camp on allowed)
BSY NO CAMPON	- treatment for attendant only
DISALLOWED	- vact, hnpi, unin, unow, unca, unpr (invalid call situations)
DIALING ERROR	- msca, mslc (incorrect prefix digits)
TOLL DENIED	- tdnd, tovd
TERM DENIED	- dntr, tess
NO PREEMPT	- blpr
PARTIAL DIAL	- pdil, psig (timeout waiting for digits)
TRUNK TROUBLE	- ssto
³³ UNDEFINED ³³	- any treatment not listed here (this should never be seen by the attendant).

2. Results of keying during terminating phase

The display basically reflects the current mode of operation of the console. Thus any key input that changes the operating mode will also change the display. If any of these keying operations were to fail, they may display an error message.

2.1 RLS, HOLD, RLS SRC, another loop

The display is cleared or updated to display information on the newly active call.

2.2 ICI keys, active loop (when not dialing), EXCL SRC/DEST, POS BUSY, NITE, SGNL SRC/DEST

The display remains unchanged.

2.3 RLS DEST

If there is no dest (correcting dialing error), this will reset the display to D1. If a dest exists and is therefore released, the display will be cleared.

2.4 Active loop (when dialing)

When used to correct dialing error, this will reset the display to D1.

2.5 Digit keys

Depending on the current call state, the display shows one of the following:

- unchanged - if the call was successfully completed and the attendant now has both a src and dest on the active loop. In this case DMS will not accept digits so any new digits keyed in will be rejected and the contents of D1 (i.e. the dialed or call forwarded digits) will be redisplayed.
- echo digits - if tone treatment (2 seconds) has already been given, the attendant is allowed to re-enter dialing phase as described in DID V0592 sec. 5.

2.6 Feature keys

Depressing a feature key other than conference will cause the display to be updated for that feature only if the mode of operation is changed. How specific features handle the display will be covered in the DID's for those features.

After a conference key hit and a dest is successfully added to a conference on src, the phrase "CONFEREE ADDED" will be displayed. Note that the display control key cannot be used after this display is done. If the conference key depression is not successful, the display will remain unchanged.

3. Revision History

Edition AA01 820916 - preliminary

Edition AA02 821001 - initial

Edition AA03 821126 - updates to DD:

1. clear port2perm cfwbit before dialing instead of after.
2. add new treatments to table.
3. update pseudo code for the display key processor.
4. make various format changes.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	FX TRUNK DIGITAL 2 WAY
Feature no	F2369

FEATURE SYNOPSIS

This feature provides a digital 2 way Foreign Exchange (FX) facility. The FX 2 way trunk capability is signalling compatible with ground start lines and outpulses either DP or DTMF digits.

FEATURE DESCRIPTION

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	SPECIAL INTERCEPT THROUGH SERVICE ORDER
Feature no	F2461

FEATURE DESCRIPTION

Lines can be removed from service through Service Order. There are two commands that are in use for this purpose. The OUT command removes single or multi-party lines and pilots of hunt groups from service. The DEL command removes members of hunt groups from service. These commands apply to both POTS and IBN lines.

With both of these commands, the user will be prompted to input an INTERCEPT. In addition to these two commands, there are two other Service Order commands which prompt the user for INTERCEPT. The CDN changes the Directory Number of a line and puts the old Directory Number on intercept. The CICP command changes the intercept on a line already on intercept.

Currently there are four valid types of INTERCEPT that are accepted by Service Order. They correspond to different treatments for the lines that are removed from service. They are:

OPRT for operator intercept, ANCT for machine intercept, UNDN for unassigned number, BLDN for blank directory number.

These intercepts are valid for both POTS and IBN lines.

This feature will let an IBN station have special intercepts in addition to the four described above. When an IBN station is removed from service the Service Order user will be offered a choice of treatments. These treatments are:

the four described above,
AINT - Attendant Intercept routed to an ICI lamp on
the attendant console,
or
CANN - Custom Announcement.

ICI code 8 is used for AINT. With CANN the user will be prompted for a number. This number must be a valid index for that customer group into the CUSTANN table. That entry in the table must have been previously assigned a valid index into the OFRT table.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDANT CALL PARK RECALL TIMER
Feature no	F2525

FUNCTIONAL DESCRIPTION

Feature Background At present, the CWNATO (call waiting no answer timeout) timer is used for timing calls parked by the attendant but not answered before the timeout expires.

The CWNATO is used for a dual purpose. It is used to

1. time the no answer period for a call that has been extended by the attendant to a party in the same custgrp and
2. time the no answer period for a call that has been parked in the customer parking lot by the attendant and is awaiting retrieval by the desired party.

This has led to a compromise for the 'best' timer value for the dual purpose of the CWNATO timer.

RECALL NO ANSWER SCENARIO

A call that is extended by the attendant to a station or trunk is alerting the called party upon termination, i.e. a phone is ringing. This announces call arrival to the called party (as soon as the attendant has finished dialing digits).

Customers usually expect the customer group subscribers to answer their phone promptly. If the called party is not answering, then other features are available for fellow subscribers to answer the ringing telephone, e.g. call pickup.

The main point is that business customers expect that the calling party should not have to wait very long for his call to be answered.

Therefore for this type of call, i.e. the call extended by the attendant, it is desired that the recall time be short.

CALL PARK APPLICATION

Call park is typically used by the attendant when the location of the desired subscriber is unknown.

For example, consider the case of the supervisor, who is 'never' at his/her desk. Calls directed to the attendant asking for this person may be parked. The attendant may then page the desired person who responds by going to the nearest telephone and dialing the call park retrieve code plus the address of parking lot space where the calling party is parked.

Factors relating to the slowness of the retrieval by the called party are:

1. time required to page the called party by the attendant,
2. time required to find a convenient telephone for the retrieval process and
3. time required to dial the call park retrieve code and address in the parking lot.

Therefore, it is desired that the recall time of a call parked by the attendant be 'long' in comparison with the recall time of a call extended to a station.

FEATURE REQUIREMENTS

A distinct attendant call park recall timer is required to time the call's duration in the parking lot when parked by the attendant.

This timer, called ACCPKTIM, (Attendant Call Park TIMER) will be settable from 12 to 240 seconds in increments of 1 second. In addition, the timer will be capable of being set for no recall, i.e. infinite by specifying the timer value equal to 0.

As usual, no disconnect trunks must be considered as villains of the customer network. If ACCPKTO is set to 0 and the calling party is connected via a no disconnect trunk, then the NDSCTO timer will be used to time the call's duration in the parking lot (refer to V0689 - Setting Attendant Recall Timers to Zero). This will ensure that the trunk is not abandoned in the parking lot should the calling party go on hook at the far end and the called party not retrieve the parked call.

ACCPKTIM will be an option in table CUSTCONS (see C0862 - Split of Customer Group Options).

The timer used for the station Call Park feature is CPKRECTO (Call Park Recall TimeOut). The range of values for this timer will be extended in accordance with the Attendant Call Park Timer from 12 to 240 seconds in increments of 1 second. For further information, refer to V0534 - Call Park, section 1.

DEFAULT CALL PARK OPTIONS

1. Currently, the default value for the customer parking lot is 0. Therefore, for the call park features to be useful to the customer group, the CPKMAXNO (call park maximum number for the customer group) must be datafilled. This parameter is part of the station call park feature, CPARK now defined in table CUSTSTN.

This parameter default will be 100 parking spots in the customer group parking lot.

2. The default value for the station call park recall timer, i.e. CPKRECTO defined in option CPARK will be 60 seconds.

3. The default for the new attendant call park recall timer, i.e. ACCPTIM will be 60 seconds.

CALL PARK USE

The default values defined in the previous section will be used at call processing time if the call park options have not been datafilled by the customer.

For example, the call park option may be added to a line. At the time that call park is invoked by this line, if the call park option has not been datafilled in table CUSTSTN, the call will check the parking lot for a maximum of 100 parked calls, i.e. the default parking lot size, and set a recall timer for the parked call of 60 seconds, i.e. the default station call park recall time.

In this way, call park is an easy feature to datafill for a line. Only the line need have the option.

Similarly, call park may be given to an attendant. The datafill is different in that a PARK key and UNPARK key must be assigned to a console. However, the attendant call park recall timer need not be datafilled and will default to a 60 second recall time at the time that a call is parked by the attendant.

Defaults are used to limit the amount of datafill that a customer has to do to get a particular feature working for the customer group.

The call park features can be customized for a particular application by setting the parking lot size and recall timers in the customer group tables.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	IBN QUANTITY CONTROL(100 LINES)
Feature no	F2526

FUNCTIONAL DESCRIPTION

In BCS9, R0343 - IBN Line Quantity Control was introduced to allow the packaging of line sizes for various sizes of IBN software packages. This feature allowed the maximum number of IBN lines in a DMS family office to be specified in increments of 1000 IBN lines.

For BCS12 and beyond, the maximum number of IBN lines includes the number of DMS proprietary sets datafilled.

Lines used for attendant consoles are not included in the line count.

Feature Requirement

This feature will obsolete R0343 - IBN Line Quantity Control.

This feature will permit the maximum number of IBN lines in a DMS family office to be specified in increments of 100 lines.

This parameter will change the type of the MAX_IBN_LINES tuple from 1000 line increments to 100 line increments in table OFCOPT.

Lines used for attendant consoles are not included in the line count.

Dump and Restore Impact

This feature will affect Dump and Restore of an IBN office for the tuple specified in OFCOPT.

Note: Table OFCOPT may be changed by BNR/NT personnel only.

For existing offices, i.e. those with BCS11 or BCS12, the existing MAX_IBN_LINES tuple should be set at the line size that has been sold to the office.

The old BCS11 and 12 value will now be multiplied by 10 times to get the same number of lines in the office.

New feature packages should be available in time for load building of BCS13. The multiplier of 10 will also serve as a check for existing IBN offices.

New offices without IBN software prior to BCS13 are not affected.

Exceeding the maximum number of lines

When the customer exceeds the number of lines that have been purchased from Northern Telecom, a message will be displayed on the MAP. This is

"MAXIMUM NUMBER OF BUSINESS LINES REACHED"

This is an existing capability and is cited for information only.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	IBN CALL FORWARDING VALIDATION
Feature no	F2549

FEATURE SYNOPSIS

This feature will permit validation of the forwarding DN at the time of the activation of call forwarding. Validation will be in compliance with MVP (multi-line variety package) call forwarding and centrex call forwarding. This feature also makes CWT and CFB compatible. The first call to a station with CWT and CFB will wait and subsequent calls will forward.

FEATURE DESCRIPTION

Under the call forward DN validation system, the customer will have more options from which to choose:

1. The forwarding DN can be validated so that the user knows that the number is "routable".
2. The forwarding DN can be validated such that the user will attempt to terminate on the forwarding DN.
3. The forwarding DN is not validated (existing system).

After activation of call forwarding, the presentation of confirmation tone indicates that the forwarding DN was successfully stored and validated according to the option chosen. If the terminating option is chosen confirmation tone is not heard but an attempt to call the forwarding DN will be made. Call forwarding is not activated if the dialed station is busy. Call forwarding may be forced to be active to the busy station at the option of the base station user. Confirmation tone is returned at the successful storing of the dialed digits but the call is not completed. Re-order is heard if the forwarding DN is not stored successfully.

Reference: FDOC BR0549

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	IBN
Feature	CUSTOMER GROUP TRANSPARENCY
Feature no	F2682

FEATURE SYNOPSIS

This feature will allow transparency between customer groups. Many IBN features are currently assignable on a per customer group basis.

In several cases, customer groups partitioning can occur with one large centrex user. It is therefore essential that features be transparent from one customer group to another.

This feature alleviates the current perceived market need for an increase of customer subgroups.

FEATURE DESCRIPTION

A DMS-100 switch serving as an integrated business network (IBN) office consists of a number of customer groups. During the early stages of the IBN development, a customer group was conceived as a logical PBX having all the characteristics of a PBX except for the independent hardware. Further divisions of a customer group were achieved using subgroups.

Since a customer group was conceived as a logical PBX, a large number of features were allowed to operate only within the customer group boundary. The exceptions to this rule were those features which had to cross the customer group boundary by their very nature (like call transfer all calls, CTALL).

As DMS-100 evolved and electronic switched network (ESN), AUTOVON, SCOPEDIAL, complicated outpulsing, cut through dialing and many other related features were developed, DMS-100 became a part of large private ESN, AUTOVON and scopedial networks. It was already a part of the public network.

Large organizations with tens of thousands of lines divided themselves into many customer groups for administrative purposes. Various organizations distributed across many cities started to have a customer group across many DMS-100 switches.

The customer group no longer remained an isolated PBX. A customer group became part of a big family of customer groups. The restriction placed on the features, that they be allowed only within the boundaries of a customer group, became unacceptable.

The objective of this feature is to allow features to cross the boundaries of a customer group (if required) and to restrict the features either

within the boundary of a particular customer group or within the combined boundaries of a set of customer groups (if required).

In DMS-100, associated with each customer group is a set of data and a set of telephony agents. The data consists of various tables filled by the customer, ie tables related to customer group, subgroups, attendant consoles, translation etc. The telephony agents are the originators and terminators of calls, ie, lines, trunks, p-phones, data units and attendant consoles. There may be many other resources associated with a customer group, but they are irrelevant to our present discussion.

In an IBN environment a telephony agent belongs to one and only one customer group.

The key to achieving customer group transparency is the concept of the intragroupness of a call. Various features in DMS-100 are allowed if the call is intragroup. Currently, the call processing software decides whether or not a call is intragroup by comparing the customer groups of the originator and terminator of the call. This means that a call is considered intragroup only if the originator and terminator of the call belong to the same customer group.

In this feature, the responsibility of deciding the intragroupness of a call is passed from the call processing software to the user. The call processing software will no longer decide the intragroupness of a call. Rather, the information about intragroupness of a call will be supplied by the user during data fill and will be stored within its translation data. The call processing software will make use of this data to decide the intragroupness of a call.

The user can choose the set of customer groups within which he desires the calls to be considered intragroup. This could be just one customer group, a set of customer groups or all the customer groups on a switch.

As mentioned above, the intragroupness of a call is decided on the basis of the originators translation data. The originator is free to declare calls to any customer group as intragroup. This may lead to undesirable results if the terminator does not want feature transparency with the originator.

In order to maintain the privacy of the terminator, each customer group declares its type when the customer group is created. The customer group type specifies the set of customer groups with which this customer group desires feature transparency.

By doing this, both originator and terminator have a say in deciding whether or not feature transparency is allowed between them.

A customer group can be datafilled (in table CUSTENG) to be one of three types, private, public or family. For a private customer group, features are allowed only within the boundary of the customer group. For a public

customer group, features are allowed whenever the originator's translation data is such that the call between originator and the terminator is intragroup.

When a customer group is of the family type, additional information about the family is datafilled in the table CUSTFAM. This data includes a family name and a family type. The family type can be either public or private. For a public family, features are allowed whenever the originator's data is set such that the call is intragroup. For a private family, features are allowed within the combined boundaries of the set of customer groups belonging to the family.

By choosing one of the above three types, a customer group can either simply ignore customer group transparency (private) and remain an isolated PBX or it can achieve feature transparency with all the customer groups (properly data filled) on the switch (public) or it can achieve feature transparency with a selected subset of customer groups (family).

The algorithm for allowing or denying features takes into account the nature of the originator and the nature of the terminator. The originator decides the intragroupness of the call. The terminator may veto this intragroupness according to its type:

- If the customer group is private, features will not be allowed irrespective of the fact that the call is intragroup.
- If the customer group is public, features will be allowed if the call is intragroup.
- If the customer group is family and the family is private, features will be allowed if the originator and terminator belong to the same family and the call is intragroup.
- If the customer group is family and it is public, features will be allowed if the call is intragroup.

References: FDOC BR0682

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	VARIABLE LENGTH/SAME LEADING DIGIT(S) TRANSLATION
Feature no	F2740

FEATURE: F2740

TITLE: Variable Length/ Same Leading Digit(s) Translation

FEATURE SYNOPSIS:

This feature allows business customers more flexibility in their dialing plans by providing the translation of dialed digits that vary in length and have the same leading digits. In this way, the same two or three leading digits can be assigned for access codes as well as station numbers.

FEATURE DESCRIPTION:

This feature will allow users to assign two different translator names when the initial digits are ambiguous and the ambiguity can only be resolved based on the number of digits. As such, it will allow IBN subscribers to dial ambiguous codes as illustrated below:

ABC to access various features (short list of digits)
ABCXX to access stations (long list of digits)

or

AB to access various features (short list of digits)
ABXXX to access stations (long list of digits)

A,B,C,X = any digits 0 to 9

The two translators consist of a short and long translator. The short translator is specified when the number of digits dialed is less than or equal to a certain value (maxshdig). The long translator is specified when the number of digits is greater than this value.

The system will recognize the end of dialing in one of two ways, an octothorpe digit (#) for digitone lines or an interdigit timeout for digitone or dial pulse lines.

The originator may be an incoming trunk, a station or an attendant console.

REFERENCE: DDOC BR0740

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ADMINISTRATION
Feature	QUERY FUNCTIONAL STATION GROUPINGS
Feature no	F2795

FEATURE: F2795

TITLE: Query Functional Station Groupings

FEATURE SYNOPSIS:

This feature is an extension of the existing "QGRP" command which provides group querying capabilities for users of the service order system.

This command currently provides the following capabilities:

- ability to list all the members of a Call Pickup (CPU) group, Speed Call Users (SCU) group, and Query Busy Station (QBS) group.

This feature will add the following capabilities to the QGRP command:

- list all of the members in a Multiple Appearance Directory Number (MDN) group, Group Intercom (GIC) group, Hunt Group (HNT), or Key Short Hunt (KSH) group.

This command is intended for use by CDC users and telco users. If the CDC user attempts to query a DN or an LEN which it does not own, use of the command is disallowed.

FEATURE DESCRIPTION:

This feature enhances the capability of the QGRP CI command by allowing the user to list all of the members in a Multiple Appearance Directory Number (MDN) group, Group Intercom (GIC) group, Hunt Group (HNT), or Key Short Hunt (KSH) group.

Query MDN Groups:

Command Input - MDN member DN or LEN (LEN type EBS requires the KEY number).

Command Output - LEN of each MDN member (also KEY number if LEN is type EBS), total members in group, Set and DN options of Primary member or first member and the DN assigned to the group.

Query GIC Groups:

Command Input - LEN (LEN type EBS requires the KEY number).

Command Output - LEN of each GIC member (also KEY number if LEN is type EBS), and total members in the group.

Query Hunt Groups:

Command Input - member DN or LEN (LEN type EBS requires the KEY number).
Command Output - if the input is LEN, then the output lists all the hunt groups and PRH lists of which the LEN is a member. If the input is DN, then the output lists all hunt groups corresponding to that DN and all PRH lists of which the LEN for that DN is a member.

In addition, all LEN's in each hunt group are specified (for EBS, KEY number is also output), as are all DN's if the hunt group is DNH or BNN. The hunt group pilot and BNN pilot are labelled within the list. The hunt group type (MLH, DLH, DNH, BNN, or PRH) and group or list number are specified at the beginning of each hunt group or PRH listing, while at the end, a total member count is printed along with any hunt group options (CIR, LOD, LOR, OFR, OFS).

Query KSH Groups:

Command Input - member DN or LEN.

Command Output - the KEY and DN of each group member and the total number of members in the group. LEN is also output when DN is the input.

REFERENCE: DDOC BR0795
NTP 297-2101-310

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	IBN
Feature	IBN - CALL FORWARD DO-NOT ANSWER(CFDA) FROM IBN HU
Feature no	F2820

FEATURE SYNOPSIS

This feature will provide call forward don't answer capability to a pilot and/or member of an IBN Directory Number Hunt (DNH) group. The call will be redirected to a different destination if the call is not answered within a predesignated amount of time. The feature will apply to both 500 and Electronic Business Set (EBS). CFDA also applies to multiline hunting and distributed line hunting.

FEATURE DESCRIPTION

CFDA can be assigned to members of a DNH group. Calls reaching a DNH member can be terminated in one of two ways:

1. A caller dials the pilot DN for the DNH hunt group and hunts to the member.
2. A caller dials the DN of the member.

The call presented to the set will ring for a predetermined amount of time and then forward to a different destination.

The forwarded destination can be another member of the hunt group. Given this scenario, if DNH member A CFDA to DNH member B, but member B's line is not idle, the call will hunt to an idle member.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURE
Feature	OPTIONAL ANSWER SUPERVISION FROM ATTENDANT QUEUE
Feature no	F2895

FEATURE SYNOPSIS

This feature modifies the answer condition of the Audio Input on Hold feature (Ref: DID V0602). A call queued by an IBN attendant console is now considered to be answered when the audio input on hold feature routes the caller to a recorded announcement after the initial audible ringing period.

FEATURE DESCRIPTION

Previously, the answer condition did not occur until the attendant answered the call. This feature generates an answer condition when the audio input on hold feature routes a queued call to a recorded announcement.

The implementation of this feature does not alter the user perspective of existing features and thus is transparent to both the caller and the attendant.

This feature does not apply after the call has been answered by the attendant. For example, if the attendant places an active call on hold (with announcement and music) this feature will not have any effect.

This feature is not applicable in the case where the announcement is the result of the caller being routed to treatment. This feature is applicable to all call types placed in the attendant console queue.

Ref: FDOC BC0946
DID V0602

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	ATTENDENT AUTODIAL
Feature no	F3411

FEATURE DESCRIPTION

The Autodial key will allow the attendant to dial frequently called numbers by depressing the key. Each Autodial key can only have one number assigned to it at a time, but the console can have as many as 42 feature keys set up as Autodial keys, 42 being the total number of feature keys on the console. Once a feature key has been designated an Autodial key it can be programmed either from the console or by filling the appropriate data table from the Maintenance and Administration position.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ENHANCEMENTS
Feature	STORING OF 24 DIALED DIGITS
Feature no	F3451

FEATURE SYNOPSIS

This feature will permit the storing of up to 24 digits for the purpose of outpulsing. Limited to IBN lines, consoles and to electronic business sets will allow for the outpulsing of auth codes plus called number to other networks.

FEATURE DESCRIPTION

A total of up to 24 digits will be collected and will be available for outpulsing or digit manipulation. IBN and POTS translations will continue to support 18 digits. For call forwarding the number of digits to be programmed will remain at 18 for CFU and CFI and 11 digits for CFD and CFB.

A result of the storage allocation re-arrangement will be the incompatibility between Scopedial and DMS-250 within the same switch.

REFERENCE

FDOC BC1027

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	CCSA AMA RECORDING - TRUNK GRP TYPE
Feature no	F3781

FEATURE SYNOPSIS

This feature provides the capability to identify CCSA calls in dedicated trunk group and to allow recording of CCSA in AT&T AMA format.

FEATURE DESCRIPTION

This feature adds a new multiple for GRPTYP = CCSA. The table control is identical for CCSA as for IBNT2 (IBN 2-Way) GRPTYP multiple.

Package NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
 Feature set SERVICES
 Feature INCREASE NUMBER OF EQUIVALENT DN APPEARANCE FOR IB
 Feature no F3940

FEATURE SYNOPSIS

This feature will provide DMS100/SL100 offices with extended capability in supporting the data required for IBN stations, Electronic Business sets and Data Units.

FEATURE DESCRIPTION

By modifying the methods used to allocate memory for the DATA structures associated with DN appearances. The total number of DN appearances for IBN and Electronic Business Sets is increased. The number of IBN lines, Electronic Business Set and Data Unit keys which have Directory Numbers associated will each have an equivalent DN. They are :

- a) Intercom
- b) Group Intercom
- c) Call Waiting
- d) Ring Again

A separate equivalent DN is associated with each P-phone and Data Unit which is assigned at least one programmable feature.

The maximum number of IBN stations, Electronic Business Sets and Data Units combined is increased to 128,000 as an absolute maximum. The number of equivalent DN appearances has been increased to 216,000.

The number of equivalent DN appearances for Electronic Business sets and Data Units must not exceed 180,048.

Assuming 6 equivalent DN appearances per Business set, the following example illustrates the capacities.

REGULAR LINES Pots/IBN	KEY SET LINES EBS/Data Units	LINE MODULES (LM/LCM) Required
10 K	30 K	80
20 K	27 K	94
30 K	23.5 K	104
40 K	20 K	120
50 K	18 K	136
60 K	16 K	152

Note The Figures assume 10⁴ keyset lines will be assigned to Data Units. E.G. 40,000 POTS, 16,000 EBS ,4,000 DU.

REFERENCE

FDOC BC1482

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	STATION FEATURES
Feature	IBN CALL PICK-UP ENHANCEMENTS
Feature no	F3956

FEATURE SYNOPSIS

It is desirable to change the service order commands in such a manner that call pickup groups can be created and manipulated using commands which will accept a list of members. This will significantly reduce the amount of time required to create and handle call pick up groups.

FEATURE DESCRIPTION

At present the creation of call pickup (CPU) groups via service orders is a repetitive, time consuming task. The reason for this is the fact that the CPU line option must be added to each line in a CPU group individually via the ADO command. Deletion of lines from a CPU group is done on an individual basis as well, via the DEO command. The object of this feature is to speed up the process of creation and manipulation of CPU groups.

The service order commands which were modified by this feature are:

EST - Changed to add the capability of creating one call pickup group using existing lines.

ADD - Modified to allow more members to be added to one call pickup group.

DEL - The command will be modified to allow deletion of the call pickup feature from one or more stations. These stations can belong to one or more CPU groups and/or customer groups.

The use of the EST, ADD and DEL commands in association with CPU groups differs from their use with hunt groups. For CPU groups the use of EST, ADD and DEL commands will not create or destroy lines but merely add or delete existing lines to or from CPU groups.

Reference: FDOC BC1453

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURES
Feature	IBN FLASH TRANSLATOR
Feature no	F5445

FEATURE SYNOPSIS

This feature allows a call to be routed to a different line appearance on a model 608 cordboard rather than the normal line appearance, if 0 is dialled on the second lg of a three way call.

FEATURE DESCRIPTON

The need for this feature arises from the use of a model 608 cordboard. The model 608 cordboard uses different physical line appearances to implement different incoming call categories. An attendant at a 608 would see lamp A flash if a call originated from a line which had dialled zero. If the station had been talking to someone and flashed the hook switch and dialld zero to transfer the call to the attendant at the 608, then lamp B would flash. This allows the attendant to differentiate between the two call types.

This feature will provide a mechanism to specify a set of up to three flash translators for STAR, OCTOTHORPE and digits. These flash translators will be used before the normal NCOS (network class of service) and customer group trnaslators.

References: FDOC BC1477

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	TRUNK BUSY VERIFY TONE
Feature no	F5628

FEATURE SYNOPSIS

This feature provides an enhanced audible signalling system with optional intervention to the trunk busy verification feature. It promotes attendant efficiency and flexibility by immediately returning an audible indication of trunk state without immediate intervention.

FEATURE DESCRIPTION

This feature is implemented on a per console basis. It allows the attendant to verify the trunk state with the option to intervene in calls already in the talk state.

Flexibility is provided to the attendant by allowing barge-in at the attendant's discretion. The attendant may intervene and request the parties involved to go 'on hook'. When this occurs the attendant will seize control of the trunk and place the call.

Attendant efficiency is improved by use of an enhanced audible signalling system which immediately returns an indication of trunk state. The attendant becomes more efficient through immediate return of trunk status for analyzation and can make the decision as to barge-in or report that all trunks are busy and move on to the next call.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ADMINISTRATION
Feature	IBN FEATURE ACTIVATION OMS I
Feature no	F5635

FEATURE SYNOPSIS

This feature adds OM groups for IBN features partitioned by Customer Group.

FEATURE DESCRIPTION

This feature is the first of three phases which will provide Operational Measurements (OM's) for IBN station features. In the past, IBN station features were developed without OM's. It is now required to provide customer feedback on feature usage and traffic and for software and hardware resource provisioning. Attendant Console feature usage and traffic om's will not be included in this phase.

REFERENCES:

FDOC BC1753 IBN Feature Activation OM's I

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	ATTENDANT FEATURE
Feature	AC EXTENDED CALLS TO CFB/CFD
Feature no	F5897

FEATURE SYNOPSIS

This feature will allow:

1. Attendant extended calls to a station with call forwarding busy (CFB) to get forwarded to a predetermined directory number (DN) when the station is busy.
2. Attendant extended calls to a station with call forwarding don't answer (CFD) to get forwarded to a predetermined DN when the station does not answer within a predetermined amount of time.

FEATURE DESCRIPTION

When the attendant extends a call to a station and the station is busy and is assigned CFB, the call will be forwarded to the remote station. In case attendant camp on applies, the call will not be camped on.

Also, When an attendant extends a call to a station with CFD and the station does not answer, the call will be forwarded to the remote station after CFD timer expiry. Automatic attendant recall will not apply.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	AUDIO
Feature	AUDIO TABLE EXPANSION
Feature no	F6432

FEATURE SYNOPSIS

This feature expands the AUDIO table to allow more audio groups for each feature type.

FEATURE DESCRIPTION

This feature expands the AUDIO table to allow up to 512 audio groups. The AUDIO table tuple has the same 2-part key of audio group and feature type. The audio group names and the feature types are predefined. Each audio group has the same features associated with it.

Ref: FDOC AD0822

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	MAINTENANCE
Feature	STAT100 FEATURES IBN EXPANDED SPEED CALL LISTS
Feature no	F6522

FEATURE SYNOPSIS

This feature will expand the number of IBN speed call lists available per office. The total number of speed call short lists per switch will be expanded to 50,000 (30,000 on NT40 based switch). The total number of speed call long lists, including 30, 50 or 70 numbers, per switch will be expanded to 32768.

FEATURE DESCRIPTION

This feature will provide the ability to expand the number of IBN speed call users.

The NT40 based OMs has a limit of 30,000 IBN lines. The enhanced core based switches will expand this to 50K IBN lines per switch. The full number of speed call lists will only be reached on an E-Core based DMS.

The maximum number of speed call lines available on an E-Core based switch are as follows:

- The maximum number of speed call short lists will be 50,000.
- The maximum number of speed call long lists will be 16,384 for long lists of 30 number, 8192 for long lists of 50 numbers, and 8192 for long lists of 70 numbers.

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	CAPACITY
Feature	EXPANDED MERIDIAN DIGITAL CENTREX CAPACITY
Feature no	F6638

FEATURE SYNOPSIS

As part of the IBN expansion to take advantage of E-Core, the FTRQ facility and some EXT blocks will require some growth to reach the 50K line capacity for BCS-26.

This feature allows the capability of IBN call forwarding to support the assignment of any call forwarding variation to a line, up to the 50K line limit. This feature also expands the data capacity required by the Feature Queuing (FTRQ) facility. The FTRQ facility is used by the following IBN features:

- auto call distribution (ACD)
- call back queuing (CBQ)
- call forward variations (CFX)
- call forward validation terminating (CFVAL)
- call hold (CHD)
- call park (CPK)
- camp on (ACO)
- last number redial (LNR)
- message waiting/call request (MWT/CR)
- query busy station (QBS)
- ring again (RAG)
- uniform call distribution (UCD)

This feature is part of the IBN expansion program. In order to achieve this threshold of 50K IBN lines, it is understood the switch must be Enhanced Core (E-Core) based.

FEATURE DESCRIPTION

This feature only enhances the capacity of data with respect to call forwarding and feature queue areas. It does not enhance the call processing capability of the system.

This feature will expand the maximum number of elements in CFX table beyond the 30K threshold, up to 50K.

NT40 Based Switches: No work will be done in this area, since the maximum number of IBN lines which can be datafilled with CFX is 50,000. This feature ensures the system will allow datafill of up to 50,000 IBN lines with CFX.

Feature Queue Areas: This feature will increase the limits of the office parameters in the table OFCENG.

Ref:

FDOC AC0312 IBN Expansion

FDOC BC1206 IBN Call Forward Enhancements

FDOC BC1482 Increase Number of Equivalent DN Appearances for IBN

NTP 297-1001-455 Data Engineering Guidelines

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	IBN
Feature	IBN - CALL FORWARD GROUP DO-NOT ANSWER(CFGDA) FOR
Feature no	F6646

FEATURE SYNOPSIS

This feature provides Call Forward Group Don't Answer for Hunt Groups (CFGDA).

Call Forward Group Don't Answer for Hunt Groups allows Call Forwarding to be assigned to a Hunt Group, so calls to idle Hunt Group stations ring for a predetermined amount of time before being forwarded either to the next station in the Hunt sequence, or to a Directory Number (DN) outside the Hunt Group but inside the Customer Group.

FEATURE DESCRIPTION

There are two forwarding destination alternatives available to a Hunt Group with CFGDA:

the call forwards to the next member in the Hunt Group
the call forwards to a specified DN.

A call may forward a maximum of five times. Subsequently, the station will continue to ring until the agent answers it or the caller abandons the call.

There are three incoming call alternatives with CFGDA:

All incoming calls are forwarded

Calls from within the Hunt Group's MDC customer group are not forwarded

Calls from outside the Hunt Group's MDC customer group are not forwarded.

A new LINETYPE is added to Table HUNTGRP to add the CFGDA option for MDC lines.

Ref: FDOC AD1164

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	SERVICES
Feature	BLIND TRANSFER RECALL IDENTIFICATION
Feature no	F7140

FEATURE SYNOPSIS

This feature allows calls that have been transferred to a third party to return to the transferring party after a specified time if the third party does not answer.

FEATURE DESCRIPTION

This feature is intended for businesses that use receptionists equipped with Electronic Business Sets (EBS) or 2500/500 sets to answer calls. This feature provides transfer recall capability to both 2500/500 and EBS sets.

A timer measures the period of the call transfer to initiates the recall process. Each customer group is able to specify a timeout period from 12 to 120 seconds. If the timeout period is not specified, the default value is 45 seconds. The timer recalls the transferring party if the call is not answered within the timeout period. The timer stops if the transferred call is answered or if the transferred party abandons the call.

Ref: FDOC AD0990

Package	NTX100AA20 INTEGRATED BUSINESS NETWORKS - BASIC (IBN)
Feature set	FEATURES
Feature	CALL WAITING AND 3WC INTERACTION
Feature no	G0021

Synopsis

This feature improves call waiting by allowing a call to wait on a 500/2500 set from the second leg of a three-way call or call transfer.

Implementation

The following feature packages are necessary for this feature package to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX901AA Local Features I

Activation and Deactivation

Two parties using 500/2500 sets are engaged in a conversation and wish to include a third party. The third party is engaged in a conversation with a fourth party. One of the sets flashes (quick on-hook, off-hook) and dials the third party. If the caller stays off-hook, ringback or a combination of a tone, announcement, and music, as specified in table CUSTSTN, are applied. The third party hears call waiting (CWT)tone. One of two events can occur:

- * The third party puts the fourth party on hold or ends the conversation, then flashes to talk to the caller. The caller can conference-in the second party or hang up and transfer the second party to the third party.
- * The caller flashes to conference-in the CWT ringback from the third party, while the third and fourth parties continue their conversation.

One application of this feature is to permit a secretary or receptionist with call wait originate (CWO) to transfer a call or place a call on CWT for a party who does not have CWT.

Interactions

This feature interworks with CWD (dial call waiting) and CWO.

Limitations

Call waiting on an EBS requires a Call Wait key.

Reference: FDOC AL0664

NTX101AA13 Status: RTM IBN - ENHANCED BUSINESS SERVICES

SERVICES	:	
DISTINCTIVE RINGING		F1180
AUDIO INPUT ON INCOMING CALLS IN QUEUE(ATTND & UCD)		F1215
EXECUTIVE BUSY OVERRIDE		F1270
UNIFORM CALL DISTRIBUTION		F1272
OUTPULSING VERIFICATION USING DMIS		F1474
ESN - VARIABLE TYPES OF OUTPULSING ON SAME CALL		F1760
	:	
FLEXIBLE CONSOLE ALERTING		F1797
DTMF OUTPULSING ON A LINE		F1887
SERVICES	:	
INTERGROUP CALLING		F2393
DISTINCTIVE AND RING AGAIN RINGING-MF		F2531
IBN	:	
ATTENDANT CONSOLE END-TO-END SIGNALLING		F2791
ACD CALL PROCESSING	:	
ACD MUSIC ON DELAY		F3458
STATION FEATURES	:	
LAST NUMBER REDIAL(LNR)		F3786
SERVICES	:	
A/C DISPLAY OF QUEUE CALLS BY PRECEDENCE		F5632
A/C ANSWER TIME BY PRECEDENCE		F5633
GENERAL DISTINCTIVE RINGING		F5837
ATTENDANT	:	
ATTENDANT TO UCD		F5890
MAINTENANCE	:	
VCD QUEUE STATUS LAMPS ATTENDANT FEATURES		F6211
FAST FEATURE-BELL SOUTH	:	
TRANSFER FOR UCD		G0088
ACD	:	
SECOND AND THIRD RECORDED ANNOUNCEMENT		G0090

Package NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
 Feature set SERVICES
 Feature DISTINCTIVE RINGING
 Feature no F1180

FEATURE SYNOPSIS

Distinctive ringing allows terminating call types to be distinguished by the station user. This feature is applicable to IBN stations.

FEATURE DESCRIPTION

Typically an IBN party will hear a ringing pattern of 2 sec on and 4 sec off. If particular terminating call types are to be distinguished by the station user, the customer can specify the call type that will generate a distinctive ringing cycle. IBN stations with ring again or call back queuing will be notified by Bell Canada ringing cycle 4 (see Table 1), when their request is served. IBN stations may optionally have a distinctive ringing cycle of Bell Canada code 3, code 1 being the default if option is not specified.

Call types which may be specified for distinctive ringing are:

1. INTRA group calls.
2. INTER group calls.
3. IBN trunks "owned by the customer group".

The customer may specify that:

- a) All or no IBN trunks in that customer group are subject to distinctive ringing.
- b) Selected IBN trunks in a customer group are subject to distinctive ringing.
- c) IBN trunks owned by other customer groups, POTS lines and POTS trunks are subject to distinctive ringing.

Ringing codes will be based on cyclic variations of 20 hz, as listed in Table 1.

TABLE 1

Ringing	ON	OFF	TIME	SECONDS
Code	ON	OFF	ON	OFF

02.04.0
11.54.5
21.50.51.52.5
31.50.50.53.5
41.50.50.50.50.52.5
51.50.50.50.51.02.0

Distinctive ringing is not supported for superimposed and frequency ringing.

Ref:

DID VO586

Package NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set SERVICES
Feature AUDIO INPUT ON INCOMING CALLS IN QUEUE(ATTND & UC
Feature no F1215

FUNCTIONAL DESCRIPTION

INTRODUCTION -----

This feature applies to calls waiting in either the attendant or UCD queues. If when the call is entered into the queue, the expected waiting time exceeds a pre-determined threshold, the calling party is first connected to a recorded announcement and then to a music source. Audio signal is removed when the call is answered or when the calling party disconnects.

FEATURE DESCRIPTION -----

Attendant call queue -----

When there are more incoming calls than the attendant can serve, delays will be inevitable before the calls can be answered. If the delay time becomes excessive, calling parties may hang up.

This feature provides a 10 second ringing tone followed by a recorded announcement advising of the delay when the delay threshold is exceeded. When the recorded announcement completes, music will be provided. The delay threshold is a customer option for each custgrp.

In the sub-group data, there is a field called ac_service_time to record how long the last call waited before answered by the attendant. If 't' is the time delay encountered by the last call, i.e. ac_service_time, and 't1' is the customer specified delay threshold, the response to the calling party will be based on the following condition:

- a) $t < t1$ - Calling party is expected to be served soon. Calling party hears ringing tone for a period of t1 seconds and if not answered in that time period by the attendant, he will hear recorded announcement. Subsequently, he will receive continuous music until the call is answered by the attendant.
- b) $t \Rightarrow t1$ - Calling party is not expected to be served soon. A ringing tone of 10 seconds will be given, followed by recorded announcement and subsequently music.

In the above cases, if an attendant becomes available, the call will be connected to the attendant.

UCD call queue

Please refer feature v0601.

Music and Attendant Announcements

Attendant busy recorded announcement can be added to the announcement system just like any announcement in the system. A CLLI is assigned to the attendant busy announcement group.

Music_on_hold can be treated as an announcement type in the announcement system. A CLLI is assigned to the the muisc_on_hold group. The music_on_hold group can share the same hardware configuration required by other announcements in the announcement system

The only difference between the muisc_on_hold announcement and other announcements is that it will have to play the music recording continuously to the calling party on hold. To achieve this, software changes are required to make the music continuous once activated. It will only stop when either the caller hangs up or the attendant answers the call.

Feature Restrictions:

This feature does not apply to IBN attendant recall or to Meet-Me conference attendant recall.

Feature Interactions:

Hook flash while the calling party is receiving audio on hold will be ignored.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	SERVICES
Feature	EXECUTIVE BUSY OVERRIDE
Feature no	F1270

FUNCTIONAL DESCRIPTION

1. DESCRIPTION -----

1.1 Introduction

This feature allows a station to gain access to a busy station by flashing during Busy Tone and dialing a feature code. This feature is known by various names:

- Executive Right of Way (Engineering Performance Specification)
- Executive Busy Override (Glossary of Terminology, PBX Systems by Marketing Programs and Services Group)
- Executive Override
- Override (SL-1)
- Break-In

Barge-In Within this DID this feature is called Executive Busy Override (EBO) which complies with MPSG standard.

1.2 Data Changes

Two new line options are required: 1. EBO - (Executive Busy Override Originator) specifies that the line can invoke EBO. 2. EBX - (Executive Busy Override Exempted) specifies that the line is exempt from EBO.

1.3 Operation

EBO originator must be an IBN line, connected to Busy Tone, and assigned EBO line option. EBO terminator must be an IBN line in the same customer group as the originating line, in the talking state, connected to a line or trunk and not assigned EBX line option. EBO works as follows: B is talking to C. A dials extension number of B. A hears Busy Tone. A flashes switch hook. If flash is not valid then Busy Tone continues. If flash is valid then A hears Special Dial Tone. A dials EBO feature code. If EBO request is not valid then A hears Reorder. If EBO request is valid then for 0.5 seconds B and C hear EBO Warning Tone and A hears nothing. EBO Warning Tone is 440 Hz at -13 dBm with pattern On 100 ms, Off 100 ms, On 100 ms, Off 100 ms, On 100 ms. EBO Warning Tone is provided by Service Circuit NT3X68AC. EBO Warning Tone is differentiated from Call Waiting Warning Tone by cadence. After 0.5 seconds a Three Way Call is established with A as the controlling party. If A does not identify himself

and state the purpose of the interruption immediately after EBO Warning Tone then B and C should hang up and call again. This will discourage misuse of EBO. A is controlling party after Three Way Call is established. If A flashes then C is disconnected and idled. This implementation has certain advantages. A can give B a message and hang up. B and C can continue their conversation.

2. FEATURE INTERACTION -----

2.1 No Double Connect

If IBN line is assigned No Double Connect option, then EBX option is assumed when EBO is attempted. EBO is not allowed even though EBX line option is not set.

2.2 Third Party

If the terminator is connected to a line with the EBX option or No Double Connect option then EBO is not allowed.

2.3 Dialing Arrangements

EBO can be used by any type of station set (DP or DTMF).

2.4 Originating Restrictions and Terminating Restrictions

If a call from originating station to terminating station is not allowed then originating station is routed to treatment when it first attempts to call terminating station.

2.5 Hunting

EBO is not allowed on a station which is member of a hunt group.

2.6 Flexible Intercept

If originating station is rerouted because of Flexible Intercept then EBO is not allowed.

2.7 Call Forward All Calls and Call Forward Don't Answer

If originating station is forwarded from terminating station using Call Forward All Calls or Call Forward Don't Answer then EBO is not allowed even if final destination of originating station is Busy Tone.

2.8 Call Forward Busy

If originating station is forwarded from terminating station using Call Forward Busy and it is eventually connected to Busy Tone then EBO can be applied to original terminating station.

2.9 Three Way Calling and Call Transfer

If originating station is connected to Busy Tone during Three-Way Calling or Call Transfer then EBO is not allowed. If busy terminating station is involved in a Three-Way Call or Call Transfer then EBO is not allowed. EBO sets up a Three Way Call but originator does not have to

have Three Way Calling line option.

2.10 Call Waiting

If terminating station has Call Waiting feature then originating station hears Ringing Tone and EBO is ignored. If originating station with EBO line option calls a terminating station which has someone Call Waiting already then originating station is connected to Busy Tone but EBO is not allowed.

2.11 Speed Calling

Speed Calling can be used by the originating station to dial the terminating station and/or the EBO feature code.

2.12 Service Orders

EBO and EBX line options can be assigned via Centrex Service Order System.

2.13 Station Message Detail Recording

For SMDR purposes it appears as if there is a call between B and C and another call between A and B. When A or B goes on-hook, an SMDR record is output for call from A to B. When B or C goes on-hook, an SMDR record is output for call from B to C. SMDR records are output only if call A to B and/or call B to C is eligible for SMDR.

2.14 Conferences

If terminating station is involved in a conference call then EBO is not allowed.

2.15 Code Calling

EBX option should be assigned to these lines.

2.16 Loudspeaker Paging

EBX option should be assigned to these lines.

2.17 Radio Paging

EBX option should be assigned to these lines.

2.18 Dictation Recording

EBX option should be assigned to these lines.

2.19 Do Not Disturb

If terminating station has Do Not Disturb activated then originating station is routed to an attendant or treatment immediately and EBO is not applicable.

2.20 Attendant Console

If terminator is associated with an attendant console (active, held, or parked) then EBO is not allowed.

2.21 Autovon Precedence Calls

If terminating line is involved in an Autovon Precedence Call then EBO is not allowed.

2.22 Trunks

If Terminator is connected to a trunk then EBO is allowed. For certain types of trunks (e.g. Loudspeaker Paging), it is undesirable to have a three-way connection. In this case the terminator should notify the originator of this fact and the originator should either hang-up or flash off the trunk.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	SERVICES
Feature	UNIFORM CALL DISTRIBUTION
Feature no	F1272

FUNCTIONAL DESCRIPTION

INTRODUCTION -----

This feature permits calls to be evenly distributed to a number of pre_designated 500/2500 stations. If all these stations are busy, new calls are queued and ringing tone is returned to the caller. If the predicted delay exceeds a customer preset threshold, a recorded announcement advising of the delay will be provided. When a station becomes idle, the first call in the incoming call queue is offered to the station.

FEATURE OPERATION -----

Uniform Call Distribution is typically used in service industries and catalog sales application where any one of a number of answering positions may equally serve incoming calls and the intention is to provide an equal distribution of calls to all available positions.

UCD will be offered as a feature option on IBN lines. To be eligible to receive UCD calls, an UCD designated position has to dial a feature activation code (e.g. lxx) followed by the UCD directory number of the group to which she belongs. Similarly, a feature deactivation code (e.g. lyy) will be required to remove the position from UCD operation.

FEATURE DESCRIPTION -----

UCD_DN ----- A group of agents or answering positions are assigned to an UCD Directory Number (UCD_DN). Each UCD_DN has associated with it an incoming call queue and an agent queue.

Incoming calls are either offered to an idle station or placed in order of arrival into an incoming call queue.

Similarly, answering positions or agents are offered a call from the incoming call queue or placed in the agent queue, when they become available from a previous call.

Call distribution and load sharing are achieved by matching the first call in the incoming call queue with the agent who has been available for the longest period of time.

Incoming call queue ----- Several UCD_DNs and hence incoming call queues and agent queues may be defined for each customer.

For each incoming call queue, the customer may define an overflow threshold above which subsequent calls will be given busy treatment.

Agent queue ----- An agent will be assigned to one and only one UCD_DN queue. The assigned queue determines to which group an agent belongs. The agent queue consists of a linked list of all available agents in a particular agent group in the order they become available from previous calls. The agent at the front of the queue has been available for the longest period of time.

Delay announcement ----- When there are more incoming calls than agents available to serve them, delays will be encountered before the calls can be answered. If the delays become excessive, callers may abandon.

A recorded announcement advising of the delay will be provided when a delay threshold is exceeded. The delay threshold is a customer option for each UCD_DN.

For every call offered to an UCD_DN, the time the call entered the queue and the time at which it was answered is recorded.

If 't' is the time delay encountered by the call most recently leaving the queue and 't1' is the customer specified delay threshold, the response to a caller entering the queue depends on the following:

- a) $t < t1$ - Caller hears ringback tone for a period of t1 (if not answered) then receives recorded announcement. Subsequent to receiving the announcement, the call is placed on silent hold or given music until answered by agent.
- b) $t \Rightarrow t1$ - Caller hears recorded announcement immediately. Subsequent to receiving the announcement, the call is placed on silent hold or given music until answered by agent.

If the caller is the attendant or the attendant is extending a call to the UCD_DN and there is no idle position available, reorder tone will be returned to the attendant.

Customers who wish to avoid complaints of toll calls being answered and routed to a recorded announcement should not provide delay announcement.

If an agent becomes available to serve a call which is receiving an announcement, the call will be routed immediately to the agent.

Abandoned calls ----- Abandoned calls will be removed from incoming call queues and recorded announcement.

Non UCD calls ----- Each agent position will be assigned an individual directory number to originate or receive calls other than those associated with the UCD_DN.

Night treatment ----- When all the agents serving an UCD_DN have deactivated the feature, the UCD_DN is considered to be in night service. All calls currently in the incoming call queue will remain queued until abandoned.

Calls newly arriving to the queue will be given a night recorded announcement.

Supervisory Position ----- No supervisory position will be provided in the current application.

Operational Measurements ----- The following statistics will be provided on a per UCD_DN basis: a) number of calls offered b) number of calls answered c) number of calls abandoned d) number of calls rejected

Audit ----- An audit process will be provided to check the integrity of all the position queues and call queues on a periodic basis. Corrective action, if necessary, will be taken.

FEATURE INTERACTION AND RESTRICTIONS -----

Hunting ----- UCD stations should not form part of a hunt group. Although similar to distributed line hunting, the two main differences are in that:

- a) In UCD the incoming call is offered to the station which has been on_hook for the longest period. This is achieved by dynamically adjusting the agent queue. In DLH, it is not always necessary that the first idle station found has been onhook for the longest period.
- b) Distributed line hunting does not allow for queueing of calls to the hunt group when an idle line cannot be found.

Call forwarding ----- CFW may be assigned to a line which is also a member of a UCD group. However forwarding can only occur when the called Directory number is the DN of the line to which non_UCD calls are directed.

Calls to an UCD_DN cannot be forwarded to another directory number since there is no pilot station from which this feature can be activated or deactivated.

Call waiting, Attendant camp_on ----- These features should not be assigned to an UCD_DN. The features may be assigned to the stations which form an UCD group. However, the basic restriction that call waiting and attendant camp_on are mutually exclusive has to be observed.

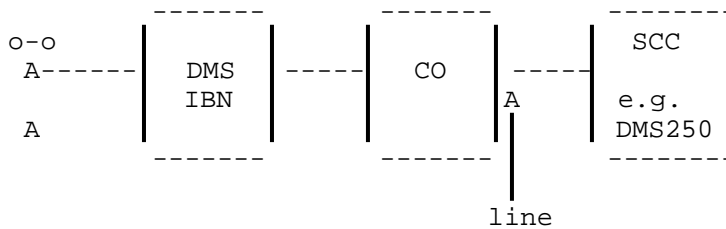
Music on Hold ----- This feature will apply to calls waiting in UCD queues. Music may be applied optionally after the delay announcement messages.

FEATURE ACTIVATION / DEACTIVATION -----

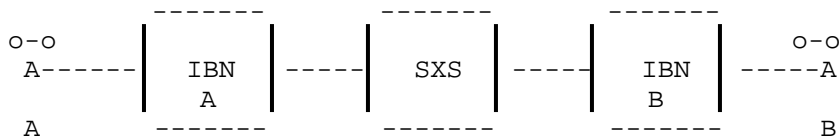
The feature will be activated on the system level on a per customer basis by defining UCD_DN groups, assigning the UCD option to the stations as well as providing data associated with each UCD_DN, e.g., maximum queue length, recorded announcement options, delay threshold and overflow threshold and on the station level by entering the feature activation code.

The feature will be deactivated on the system level on a per customer basis by removal of UCD_DN groups and the UCD option from the stations and on the station level by entering the feature deactivation code.

Package NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set SERVICES
Feature ESN - VARIABLE TYPES OF OUTPULSING ON SAME CALL
Feature no F1760

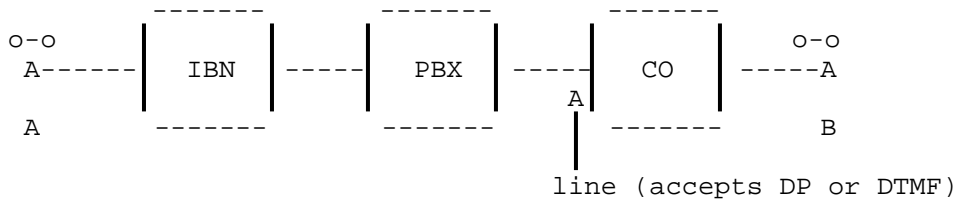
FEATURE BACKGROUND**ACCESS TO SPECIALIZED COMMON CARRIER**

A dials a destination which is routed via a SCC. DMS must output a 7 Digit DN. Audible Ringback tone is returned from the CO. When the SCC answers, dial tone is returned, an optional Auth code followed by the Destination DN is output. The first stage may be output in DP, DTMF or MF. During the second stage, the CO is transparent to the DTMF digits output to the SCC. For the second stage, a change in outputting signaling mode and interdigital timing is required.

USING DMS POTENTIAL

Subscriber A dials the destination DN of subscriber B. Both are served by DMS switches. The first stage of outputting is in DP. The SXS switch selects a trunk to DMS B and DMS B returns dial tone. DMS A, the originating switch, changes to DTMF outputting which is "whistled" through the Stepper to the DMS B where the call is completed, thus reducing the post-dial delay.

Note: only trunks capable of accepting both DP and DTMF should be used for this purpose. e.g. any IBN trunk which is datafilled for DTMF incoming signaling.



During the outpulsing of digits, it may be possible to switch from DP to DTMF outpulsing. This is desirable because it reduces post dial delay.

An example would be where DMS is connected to a PBX and signaling between DMS and the PBX is DP. The DMS subscriber wishes to access a subscriber located off-net at the CO connected to the PBX. DMS would seize the trunk; pause for a predetermined time, outpulse the digit 9 in DP, pause for a pre-determined time, and outpulse the 7/10 Digit DN in DTMF.

CHANGING INTERDIGITAL TIMING

During the outpulsing of access codes and the extension number from DMS, it is desirable that outpulsing be completed quickly to minimize post dial delay. If DMS is outpulsing to a #5 Crossbar, an Interdigital Time of about 300 msec could be used. If outpulsing to a SXS switch, then the Interdigital Time should be increased to about 700 msec. The #5 Crossbar will be in a dial repeating mode and thus DMS should increase the interdigital time to the #5 Crossbar to ensure that the SXS is ready to receive the next train of dial pulses.

Note: Not all trunks are capable of operation in the dial repeating mode.

FUTURE FEATURES

Future Features will require the capability of converting to MF outpulsing from either DP or DTMF. These include DISA-like features and DATA offerings.

FEATURE DESCRIPTION

Digit Manipulation will include the capability of allowing changes in the outpulsing signaling mode and interdigital timing while outpulsing on a trunk. Datafill in the DIGMAN Table will allow changes in signaling mode and interdigital timing at any point during the outpulsing of digits.

Note: On trunks where anispsill is required, anispsill is always done in MF.

Note: PBX offering of AIOD is done on a datalink separate from the trunk signaling.

Note: DP will not be outpulsed once electrical answer is received. This restriction does not apply to fake answer or answer detected by the Audio Tone Detector.

Note: Stop dial signals from the far end will be handled by DTMF and MF outpulsing.

Typically, a change in the signaling mode implies a change in the interdigital timing.

TYPICAL OUTPULSING VALUES

Signaling Mode -----	Interdigital Time -----	
DP	700 ms	typical
	300-1000 ms	range
DTMF	50 ms	typical
	30-300 ms	range
MF	70 ms	typical

Note: DMS allows a range of 0 to 1 sec for interdigital times for all outpulsing types.

The above ranges for interdigital time represent a "typical" range of values that are datafilled. Other values can be datafilled. Typical values specified above will be used as a default when interdigital times are not datafilled.

SPECIFICATION

One Digit Manipulation Command, SIG, is defined in Table DIGMAN to specify the signaling protocol during outpulsing. The signaling mode and interdigital time is specified.

SIG may be used to

1. change the signaling type only, where the default interdigital time will be used
2. change the interdigital timing, where the current signaling type will be used
3. change both the interdigital timing and the signaling type.

WARNING

It is the responsibility of the customer to ensure that the signaling mode is compatible between originating and terminating offices.

Interdigital timing changes may be done but the customer must ensure that the interdigital times are within specifications of the terminating office.

Package NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set
Feature FLEXIBLE CONSOLE ALERTING
Feature no F1797

FEATURE DESCRIPTION

This feature will permit longer console buzzing during off-hours. During regular hours, console buzzing can be eliminated to reduce room noise in which case alerting will be done via the headset, not the console speaker.

Feature Background

At present, an attendant is audibly alerted to a call requiring some form of assistance by a brief burst of console buzzing via the console speaker.

Occasions arise where the brief burst of audible tone is either inadequate or is annoying. Both scenarios are briefly described below.

Scenario 1

In many applications the customer never really activates Night Service. During off-hours, security guards perform regular attendant functions in addition to their main duties. In some cases, the guard takes over from the regular attendant and uses the same console in the same place. In other cases, the guard (and console) are located in the guard house where noise from other alarms obliterates the brief burst of audible tone generated by the console. In addition, many guards are accustomed to alerting tones remaining in effect until some action is taken. Based on this, the attitude is "it went away, so no action is necessary." This results in calls either waiting an inordinately long time for answer or abandoned calls.

Scenario 2

The regular day time attendant group consists of a very large number of attendants. These people are located in an environment the same as or similar to that of a toll operator. Their main or only duty is to answer and extend calls, respond to recalls and provide assistance to callers. In this case, audible alerting via the speaker, no matter how brief or whether the volume is turned down, contributes to room noise.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	
Feature	DTMF OUTPULSING ON A LINE
Feature no	F1887

FEATURE DESCRIPTION

DTMF Outpulsing On a Line is a means of ringing a designated line and, upon answer, outpulsing digits via DTMF signalling.

This optional feature permits a DMS-100 **equipped with the IBN software package** to interface with a "Specialized Common Carrier" (SCC) - perhaps a DMS-250 - within the existing ENFIA tariffs, i.e. as a line termination. This interface does not require that the calling party be equipped with a digitone set. In fact, the calling party may not be aware that DMS-100 IBN has routed the call via the SCC.

This capability may be used also to build a private network of 2-wire one-way or two-way "trunks" which have line interfaces at the originating switch (DMS-100). These line interfaces can be located at the host or at a remote. Again, the switch must be equipped with the IBN software package.

This feature can be used for any application which requires that a line be rung and given DTMF outpulsing upon answer. For example, the feature could implement the central office end of a DID trunk group using line terminations, subject to the following restrictions:

- * The office must be equipped with the IBN software package.
- * The "trunks" can be datafilled (using the LINE selector) in the IBNRTE table only.
- * The remote PBX must be capable of accepting DTMF inpulsing after detecting (and answering) the physical ringing applied by DMS. SL-100, for example, has this capability when the **FX on DCM** (R0369) and **Direct Inward System Access** (V0508) features are used together.

This feature can be used in conjunction with other capabilities of the Business Services package such as **Audio Tone Detection** and **Simplified Dialing**, or may be used on its own.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	SERVICES
Feature	DISTINCTIVE AND RING AGAIN RINGING-MF
Feature no	F2531

FEATURE SYNOPSIS

This feature provides coded 30 hz ringing on an LM/LCM basis. Coded (30 hz) ringing provides for distinctive ringing patterns at 30 hz to differentiate the type of call.

FEATURE DESCRIPTION

This feature supports distinctive ringing based on cyclic variations of 30 hz.

A new entry C30 is added in the table LMRNG and table LCMINV for this type of ringing. Coded 30 hz ringing does not support 2/4/8/10 party lines and revertive splash ringing. The feature supports the following:

1. Distinctive ringing pattern for type of call using ringing code 3.
2. Ring again and call back queuing rings using ringing code 4.
3. Scopedial precedence ringing or ringing code 5.
4. 1FR lines using code 0.
5. Ring splash for call forwarding

The six second ringing cadence for 30 hz coded ringing is identical to the ringing cadence for coded 20 hz ringing.

Ref:

NTP 297-2101-451 Section 115

FDOC BRo0531

DID VO586

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	IBN
Feature	ATTENDANT CONSOLE END-TO-END SIGNALLING
Feature no	F2791

FEATURE SYNOPSIS

This feature will allow an IBN attendant console to generate DTMF signaling after the voice connection has been set up. The console generates the digits in FSK (frequency shift keying). The FSK digits will be received in the DMS and regenerated in DTMF. The DTMF signals will be used to control terminating equipment e.g., paging or dial dictation.

FEATURE DESCRIPTION

To use this feature, an attendant console must be active on a loop with a line or trunk termination. To activate this feature, the attendant will then press the End to End feature key followed by the digits followed by the End to End feature key. The digits are then outpulsed from the switch as DTMF. The attendant can send more digits as required, followed by keying the End to End feature key. To deactivate the feature the attendant would depress the feature key twice.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	STATION FEATURES
Feature	LAST NUMBER REDIAL(LNR)
Feature no	F3786

FEATURE SYNOPSIS

Last number redial will allow a customer to redial his last called number by using a single key instead of the full number. This feature is available in the IBN environment for both 500/2500 sets and proprietary sets.

FEATURE DESCRIPTION

This feature is activated by depressing the # key for the P-phone and 2500 sets. For 500 set an # equivalent digits are dialed (data fillable).

When an # or # equivalent is dialed, the digits of the stations last called number will be automatically outpulsed by the system.

Only one called number will be stored for each line. The stored number will survive WARM and COLD starts but not RELOAD.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	SERVICES
Feature	A/C DISPLAY OF QUEUE CALLS BY PRECEDENCE
Feature no	F5632

FEATURE SYNOPSIS

This feature provides an attendant with a visual indication of the number of calls queued to be answered.

A new feature key, display queued calls is assigned to the attendant console. Using this feature key, all of the calls queued for a console subgroup can be displayed, or the calls queued can be broken down by a specific incoming call identification (ICI) category. Some examples of ICI categories are:

- precedence calls
- direct calls
- directory assistance
- inwats

FEATURE DESCRIPTION

The attendant can display the number of calls queued to be answered. In table FNMAP a new feature key is assigned called display queued calls. The display queued calls feature key can display the number of calls queued to be answered for the attendant's subgroup, or for a specific ICI category.

The display will show an ICI name or 'ALL', the number of queued calls and the time the oldest call has waited in seconds.

Reference: FDOC BV1920

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	SERVICES
Feature	A/C ANSWER TIME BY PRECEDENCE
Feature no	F5633

FEATURE SYNOPSIS

The feature will provide operational measurements of the mean waiting time for calls queued to an attendant by precedence. Four registers are required and are used for measuring - 1) the total amount of time that precedence calls are in the call waiting queue; 2) the total number of precedence calls that are answered by the attendant console; 3) the total number of precedence calls that are abandoned by the callers while waiting in the call waiting queue, and 4) the total number of times that each attendant console in each subgroup is in an 'all loops busy' state.

These measurements are an on-going average for each of the five types of precedence call levels that are served by the attendant console.

FEATURE DESCRIPTION

This feature has its own omgroup, PRECAVGQ, and is indexed by console customer group, subgroup and precedence level. The omgroup contains four registers which measure call processing events as precedence calls are processed by the attendant console operator. The following four registers are defined:

PQTIME - Precedence queue time - the usage count of the total time, in seconds, that precedence calls are in the call waiting queue.

PQANSWER - precedence queue answer - the peg count of the total number of precedence calls answered by the attendant.

PQABDN - precedence queue abandon - the peg count of the total number of precedence calls abandoned by the caller while waiting in the call waiting queue.

PQFULL - precedence queue full - the peg count of the total number of times each attendant console in each subgroup is in an 'all loops busy' state due to the 'holding' of calls while calls are continually being enqueued.

Note: The AVERAGE answer time is derived from a simple division by the user of the PQTIME and PQANSWER fields.

$$\text{Average Answer Time (in seconds)} = \frac{\text{PQTIME}}{\text{PQANSWER}}$$

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	SERVICES
Feature	GENERAL DISTINCTIVE RINGING
Feature no	F5837

FEATURE SYNOPSIS

This feature enhances the distinctive ringing feature. It enables the customer to specify which ringing cadences would be applied to the various types of calls. This feature applies to both regular 500/2500 sets and electronic business sets.

FEATURE DESCRIPTION

Distinctive ringing allows a customer on an IBN line to differentiate the type of calls terminating on the station. Bell Canada ringing cycle (RCRC) 0 is the default ringing whenever distinctive ringing feature does not apply. Distinctive ringing changes the cadence depending on the type of call terminating on the subscriber station.

The ringing cadences supported are:

1. BCRC 1, resembles normal ringing BCRC 0. i.e., 2.0 sec ON, 4.0 sec OFF, repeated ...
2. BCRC 2, i.e., 1.5 sec ON, 0.5 sec OFF, 1.5 sec ON, 2.5 sec OFF, repeated ...
3. BCRC 3, used to differentiate between types of station calling i.e., 1.5 sec ON, 0.5 sec OFF, 0.5 sec ON, 3.5 secs OFF, repeated
4. BCRC 4, used for ring again and call back queuing. i.e., 1.5 sec ON, 0.5 sec OFF, 0.5 sec ON, 0.5 sec OFF, 0.5 sec ON and 2.5 sec OFF, repeated ...
5. BCRC 5, for non-scopedial office on regular phones. i.e., 1.5 sec ON, 0.5 sec OFF, 0.5 sec ON, 0.5 sec OFF, 1.0 sec ON, and 2.0 sec OFF, repeated ... or scopedial precedence ringing in scopedial office for P-phones and regular phones (4 short bursts). i.e., 0.5 sec ON, 0.5 sec OFF, 0.5 sec ON, 0.5 sec OFF, 0.5 sec ON, 0.5 sec OFF, 0.5 sec ON, 2.5 sec OFF, repeated ...

Distinctive ringing does not affect the audible ringback heard by the calling party.

The types of calls that can be datafilled to receive distinctive ringing at different cadences are:

1. Intragroup calls - this includes calls from IBN stations in the same customer group.

2. Intergroup calls - this includes calls from IBN stations in other customer groups.
3. IBN trunks owned by the customer group.
4. Group intercom calls.
5. Everything else - this includes IBN trunks owned by other customer groups, POTS lines and POTS trunks.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	ATTENDANT
Feature	ATTENDANT TO UCD
Feature no	F5890

FEATURE SYNOPSIS

This feature will allow an attendant console to originate or extend calls to Uniform Call Distribution (UCD) directory numbers (DN).

FEATURE DESCRIPTION

UCD is an optional feature available with SL-100 and Centrex systems. The feature is used when a large volume of calls is to be answered by a group of 500/2500 telephone set agents allocated for this purpose. Potential applications include service industries, airline reservation and others. Incoming calls are lined up in priority first and then in the order in which they arrive.

The attendant to UCD feature will provide the ability for origination and extension of calls that are to be queued to a UCD agent.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	MAINTENENACE
Feature	VCD QUEUE STATUS LAMPS ATTENDANT FEATURES
Feature no	F6211

FEATURE SYNOPSIS

This feature provides, at an interval specified for the DMS-100/ SL-100 switch, a visual indication of the waiting times of the first calls in the incoming call queues of the Unfirom Call Distribution (UCD) groups with the queue status lamp option. This indication is updated periodically at intervals specified for the switch. The visual indication is made by turning on one of the three SD points assigned to each UCD group. The SD points can be hooked up to lamps or some other external device. The assigned SD points are turned on in the order they are specified in the QSL option for an UCD group, depending upon the length of time the first call in the incoming call queue remains on the queue. The SD points are turned on one at a time and are turned off when the next SD point is turned on. When there are no calls in the incoming call queue, no SD points are turned on.

FEATURE DESCRIPTION

The UCD queue status lamp feature enables individuals to determine which UCD group needs help and whether additional agents or a redistribution of agent positions is required so that incoming calls can be handled more efficiently.

UCD groups with QSL option are inspected, at an interval specified for the DMS-100/SL-100 switch, by a background audit to determine and display indications of the waiting times of the first calls in the incoming call queues.

Each UCD group with QSL option is assigned three SD points, SD Point 1, SL Point 2 and SD Point 3, which are hooked up to lamps or some other external device. When the audit runs and it detects that MAXCQSIZ (maximum number of calls that can be queued in the group's incoming call queue at any one point in time) or MAXWAIT (; maximum time, in seconds, that a call should have to wait in the incoming call queue) is equal to zero, all three SD points will be turned off. If MAXCQSIZ and MAXWAIT are not equal to zero, but there are no calls in the incoming call queue for the UCD group with QSL option, the three SD points are turned off. However, if the wait time of the first call in the incoming call queue is less than or equal to the value of the audit interval, SDPOINT1, will be turned on. If the wait time has exceeded the value of the audit interval, but is less than or equal to twice the value of the audit interval, the SDPOINT2 will be turned on. Finally, if the waiting time of the first call in the incoming call queue has exceeded twice the value of the audit interval, the third SDPOINT3, will be turned on and SDPOINT1 and SDPOINT2 will be turned off.

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	FAST FEATURE-BELL SOUTH
Feature	TRANSFER FOR UCD
Feature no	G0088

Synopsis

This feature allows a party involved in a three-way call (3WC) or 3WC chain to dial a uniform call distribution (UCD) DN. A UCD agent can participate in a 3WC as an add-on party. Calls originally directed to a non-Uniform Call Distribution (UCD) Meridian Digital Centrex station can be transferred to a UCD station within the same customer group. Calls can now be transferred out of a UCD group and between UCD groups.

Implementation

This option can be assigned to an EBS or 500/2500 set either on a customer group or a line basis.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX901AA Local Features I

Activation and Deactivation

A caller involved in a 3WC or 3WC chain flashes the hook-switch or presses the 3WC key and dials a UCD DN.

Interactions

Any features incompatible with 3WC are also incompatible with 2WC to UCD.

Limitations

UCD continues to block calls from attendant consoles where the source is involved in a 3WC.

Mutual ringback is not supported if one of the parties is a UCD agent.

All flash features are suppressed while the conference circuit is allocated.

A party being held by call hold or permanent hold cannot initiate a 3WC.

Calls transfered to UCD can not be recalled and do not start the recall timer.

If an attempt is made to include an add-on party in a conference while ringing, a call cannot forward to a call forward don't answer DN.

Reference: FDOC AF1277

Package	NTX101AA13 IBN - ENHANCED BUSINESS SERVICES
Feature set	ACD
Feature	SECOND AND THIRD RECORDED ANNOUNCEMENT
Feature no	G0090

Synopsis

The Second and Third Delay Announcement feature provides music, silence, or ringing between announcements.

This feature lets the caller know that his call has not been disconnected and thus reduces the overhead resulting from second call attempts.

Implementation

This feature is implemented through datafill in Table AUDIO. Table AUDIO has been altered to allow up to six routes to be datafilled in the route list. The delay intervals are datafilled as routes between announcements routes.

A new field, TIME, in Table AUDIO is used to specify the delay thresholds, i.e., the length of the delay between announcements. If a delay threshold equals zero, the delay interval will continue until the call is answered or the caller hangs up.

A new route choice, called "repeat", has been added to Table AUDIO. The repeat choice includes a field to specify the route to start repeating. The repeat choice is allowed only as the final choice.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

The Second and Third Delay Announcement feature can be used with the following features:

Uniform Call Distribution Queue

Call Hold
Permanent Hold
Station Call Park
Dial Call Waiting
Call Waiting Originating
Automatic Call Distribution
Keyset Music on Hold

Restrictions

The maximum length of a period of music, silence, or ringing is 1800 seconds.

Consecutive announcements are allowed, but a delay interval cannot be followed by another delay interval.

The final announcement is always followed by music, ringing, or silence.

The Attendant Console features cannot datafill delay intervals, the ringing and repeat choices are not allowed, and silence is allowed only as a last choice.

Reference

FDOC AD1128

NTX102AA04 Status: RTM IBN - STATION MESSAGE DETAIL RECORDING

IBN	:	
STATION MESSAGE DETAIL RECORDING		F0425
NUMBER IDENTIFICATION/CHARGING	:	
TRUNK IDENTIFIER IN AMA/SMDR RECORD		F0569
IBN	:	
ESN - ANSWER SUPERVISION GENERATION		F1763
ADMINISTRATION	:	
AMA FAILURE ROUTING OPTIONS		F2475
ANI INFORMATION IN SMDR OUTPUT		G0118

Package	NTX102AA04 IBN - STATION MESSAGE DETAIL RECORDING
Feature set	IBN
Feature	STATION MESSAGE DETAIL RECORDING
Feature no	F0425

DESCRIPTION

This feature will provide for the recording of both chargeable and non chargeable type calls on a per Customer Group basis using SMDR format.

SMDR will be independent of LAMA. Therefore, if SMDR is specified for a Customer Group, the office need not be equipped with LAMA. This applies to class 5 offices.

If the office is also equipped with LAMA (DMS-100 is a class 5), an IBN customer group has the SMDR feature, 2 records will be generated for each toll call. One record will use the LAMA format, the other the SMDR format.

If the customer group has SMDR, the following can be specified, at the customer group level:

1. Record all DOD calls
2. Record the following types of DOD calls
 - a. DDD calls. This includes Inwats and toll directory assistance
 - b. IDDD calls (011+)
 - c. Operator assisted calls (0+ and 01+=)
 - d. Operator handled calls (0-)
 - e. Local directory assistance
3. Other types of calls to be recorded. This will be done by specifying the access or prefix code dialed for the service. In the case of Kodak, the codes entered would be 28 and 1 for EPSCS and local tandem traffic respectively.
4. Answer timing allowance. This timer can be set from 1 to 30 seconds in 1 second increments. The default is zero seconds in which case timing for answer does not apply.

As an office parameter, whether the called number will be:

- a. output as dialed
- b. output as outpulsed by DMS

If option (b) is specified, both (a) and (b) will be recorded, with (b) as an extension to the SMDR entry.

The initial access or prefix code dialed will also be recorded e.g. 9, 28, 1, 1xx, etc. When ARS is developed, a code will be output to indicate whether the reoute used was selected by DMS, or by the station or attendant.

If the station is assigned Special Billing, the Special Billing DN will be recorded as the calling number.

A CDR bool can be assigned to Incoming trunk groups. This will permit a PBX customer to record Inwats calls answered by the attendant or night station.

On trunk to trunk connections, the incoming trunk group CLLI and trunk member number will be recorded plus the number received from the originating PBX. This is specifically included to permit Kodak to record EPSCS traffic that DMS-100 tandems for buildings 12, 26 and 313.

For DISA calls, the DISA DN will be recorded. This also applies where no digits are received (trunk seizure or ringing) on DISA trunk groups. DISA is a future feature.

When DMS-100 forwards a call and SMDR applies, the base station DN and the remote DN will be recorded. Call forwarding will be identified in the SMDR record.

SMDR may apply to 1 or more "legs" of an attendant established conference call. Each leg will be a separate record with conference identified in the record. The console number will also be included.

SMDR may apply to both legs of a 3 way call. Each leg will generate a separate SMDR record.

SMDR may apply to both legs of a transferred call. Call transfer will be identified. For billing integrity, both ends of the resulting connection cannot be chargeable e.g. 2 toll calls. The call transfer feature handles this by tearing the call down.

The following apply to attendant calls:

1. If the attendant originates calls to both the source and destination (same loop), if SMDR applies to both, 2 separate SMDR records will be generated. The console number will be included in both SMDR records.
2. Same as 1 above, but the calls from the attendant to both the source and destination are chargeable e.g. 2 toll calls. 2 separate LAMA records will be output with the customer group billing DN included in each record instead of the console number. 2 separate SMDR records will also be output as described in (1). LAMA recording applies to class 5 equipped with LAMA.

3. If the attendant answers an incoming call (any type of incoming call) and then dials a number to which SMDR applies, the following will be recorded:

a. station DN if the answered incoming call was from a DMS-100 served station

or
--

Incoming trunk group CLLI and trunk member if the call is from another switch.

b. the called number dialed by the attendant

c. the console number.

If LAMA applies, a separate standard LAMA record will be generated consisting of the customer group billing DN and the called number.

4. Attendant answers incoming trunk call which has the CDR flag set. This will produce 1 record. If the attendant then extends the call to a number to which SMDR applies, another record will be produced.

5. The following will be developed if time permits but is not a gating feature:

An IBN station dials the attendant. The station has the CDR option set. The SMDR record output will be:

a. If the attendant does not extend the call:

- the station DN
- the console number

b. If the attendant extends the call:

- the station DN
- the called number (dialed by the attendant)
- the console number

If extended, records 5a and 5b will both be output.

Authorization and Account Codes, DISA

The authorization and account code fields will be in 2 separate extension records. Each will accommodate 14 digits.

If authorization and account codes are combined (reference F0759), the authorization and account code will be written into the same extension record. Combined authorization/account codes must not exceed 14 digits.

If an account code is input, an SMDR record is always generated.

An SMDR record will only be output if SMDR applies to the call for which an authorization code was input.

SMDR always applies to DISA.

Feature Interaction

If an attendant busy verifies a station or trunk, any billing (SMDR or LAMA) will continue during the busy verification process. It is not disturbed. This is necessary since SMDR records must match telco billing records.

If ONI applies to the calling station, the call does not involve the attendant, an SMDR record will not be produced.

SMDR records will be written to tape or a disk. The actual output device is transparent to the SMDR feature.

In a class 5 office, SMDR records will be output using the AMASUB facilities. Currently this involves tape only, but future enhancements include output to disk.

SMDR records will be output in EBCDIC.

Where answer is expected and received, the existing office timing parameters will apply to SMDR. Therefore, SMDR timing will be as accurate as LAMA except where the answer timing allowance is used.

Where answer is never received, the answer timing allowance will be used. This timing allowance is used once:

1. DMS has completed outpulsing to the other office.
2. The end of dialing timer has expired for cut through operation (future feature).

If the end of dialing timer expires, the station is still off-hook and the distant end has not released, it is assumed that answer has taken place. The use of a timer is still a guesstimate at true answer e.g. the station or (attendant) may listen to distant end busy tone, announcement, may cycles of ringing, the timer value may be invalid for the call type (number served by local office versus a toll call).

Answer timing allowance will apply to both class 5 and PBX IBN applications but only to trunk groups where answer is never received. The type of supervision is contained in a field in the trunk group data.

For all other applications, the time recorded will be the difference between connect and disconnect (if answer does not occur) or the difference between answer and disconnect.

Feature Restrictions

The CDR flag in a POTS environment can be set on a per line basis. In an IBN environment it can also be set on a per line basis to record intrahub calls. If set for IBN lines, SMDR records will be produced. This feature may not be available in the Kodak or first Bell Canada application time frame. It is not a gating feature.

SMDR Records

All SMDR records will contain the following:

- Customer Group CLLI
- Customer subgroup number
- Station DN if station originated or the Special Billing number
- Attendant Console number if attendant originated or extended.
- DISA DN if DISA originated
- Incoming Trunk Group CLLI and member number if call is of tandem type or attendant extends the answered incoming trunk call and SMDR applies to the tandem connection (e.g. EPSCS) or the number as dialed by the attendant. This also applies if the CDR flag is set for the incoming trunk group.
- Outgoing Trunk Group CLLI and trunk number
- Called number including prefix digit(s). This is the number as dialed by the station or received on the incoming trunk.
- Optionally, the called number as outpulsed by DMS.
- Digit missing flag. This flag is required when cut through dialing is implemented and the called number exceeds 23 digits.
- The Authorization Code - 14 digits maximum.

- The Account Code - 14 digits maximum. Only one account will be recorded per call.
- The feature code, where applicable. This will apply to 3 way calling, call transfer, 6 port conference calling, call forwarding.
- DMS ARS route selected.
- The conversation time or connect time.
- The time and date of the call.

Package	NTX102AA04 IBN - STATION MESSAGE DETAIL RECORDING
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	TRUNK IDENTIFIER IN AMA/SMDR RECORD
Feature no	F0569

DESCRIPTION

This feature allows the operating company to record the incoming and outgoing trunk identifiers along with the usual billing information now provided by the AMA or SMDR system.

Activation of the feature is via the OFCPARMS table. The entry 'AMA_TERMINAL_ID' when set to TRUE will result in an extension entry being generated for each billing entry. This extension entry contains the numerical identifiers for the trunk group and trunk number in group of both the trunk circuits involved in the call.

In order to convert the numerical identifiers to external identifiers (i.e., the CLLI) a data table is output when the tape is mounted as an AMA or SMDR tape. Data is formatted in 2048 byte blocks with a unique block header record.

The block header record is similar to the AMA/SMDR call record block header but contains additional information regarding the format of the data and the logical record length. At the end of the data dump, a dump termination record is output.

NOTE: (i) This feature is applicable to DMS-200 incoming CAMA trunks and DMS-100 SMDR tie trunks.

(ii) With this feature also comes the removal of the first file on the tape (i.e., the format file) which is currently always empty.

(iii) The first logical record on the tape is no longer the incoming transfer 'FA'. On mounting the tape the data table is output and only after it is assigned does it become available for call recording.

Package NTX102AA04 IBN - STATION MESSAGE DETAIL RECORDING
Feature set IBN
Feature ESN - ANSWER SUPERVISION GENERATION
Feature no F1763

FEATURE BACKGROUND:

PBX's, traditionally are given an interface at the CO consisting of a line card similar to the variety connected to a telephone set. 5X25 was developed to fill this role.

With this, SL-100 development entered the environment of trunks with little or no supervision.

Centrex has not been free of its kludges to the telephony network. Foreign Exchange (FX) lines are a recognized tariff and provide an alternative to customers who want "cheap" tie lines. However, transmission can be as poor as the supervision that supports it.

Answer supervision is not received from the far end if the outgoing trunk is a 5X25 or FX on DCM because these trunks are connected to lines at the far end. Answer is required in DMS so that features, e.g. three way calling, call waiting, etc., can be invoked (the call must be in the "talking" state).

Therefore, a fake answer message from these trunks is sent in from the peripherals to allow the progression of the call to the "talk" state. However, the answer message is sent in regardless of the supervision set for the 5X25 or FX on DCM trunk group, i.e. ANSDISC, DISCONLY or NODISC.

Note: 5X25 and FX on DCM are always DISCONLY or NODISC, never ANSDISC.

The ANSTIMAL (answer time allowance) option in the Customer group data allows the customer to compensate for the lack of true answer from DISCONLY and NODISC trunks (5X25 and FX on DCM only) for SMDR purposes.

The time datafilled in the ANSTIMAL field is used as a threshold time that is compared to the elapsed time of the call. The elapsed time of the call is defined as the time from when the call was answered (i.e. fake answer msg received from the peripheral) to when the call finished. If the anstimal threshold time is greater than the elapsed time, then the call is treated as not being answered in the SMDR file. Otherwise, answer is recorded in the SMDR file.

FEATURE DESCRIPTION

This feature allows a customer to use the DMS tone detector to detect answer by voice detection on trunks that do not return answer supervision. True answer would then be reflected in the SMDR record.

However, if the tone detector is used to detect answer on all trunks with trunk supervision type - NODISC or DISCONLY, then the ANSTIMAL option need not be datafilled because "true" answer will be detected by the tone detector.

For trunk to trunk calls, DMS will not necessarily signal off-hook toward the incoming trunk if the incoming trunk is already in the off-hook state. Rather, this is a function of what would happen normally if ATD answer detection is not used. Answer detection by the ATD only allows the customer to increase the accuracy of their own SMDR records.

The following illustrates the results obtained by the ATD for various applications:

1. Trunk Type IBN

a. Supervision Type: ANSDISC. Answer is returned from the far end and reflects TRUE answer. However, there are certain cases where answer is not returned. This is dependent on the far end routing arrangements. A customer may not always 'know' when answer is being returned. For example, Kodak access to EPSCS is via Rochester Tel's #1 ESS. The Telco may route the call on the cheapest facilities available at the time - some which do not return answer supervision to Kodak. Therefore, this supervision type is eligible for ATD answer detection. If ATD answer detection is datafilled in the digit manipulation data for this case, then the ATD will look for voice answer until found (if timeout does not occur) or the TRUE answer message is received from the far end. This is necessary to turn features on.

b. Supervision Type: NODISC, DISCONLY. These supervision types are used for 5X25 and FX on DCM only. For these trunks, true answer is never returned from the far end. Therefore, these supervision types make the trunk eligible for ATD answer detection.

Note: For all outgoing IBN trunks, ATD answer will not necessarily be returned to the incoming trunk. Therefore, the originating office may not be able to get an accurate conversation measurement, unless it is also using an ATD for answer detection. This is applicable for trunks that are not already in the off-hook state.

2. Trunk Type CAMA

* Answer may not be returned on an outgoing CAMA trunk. There are two types of anispill that can occur for CAMA.

- Sustained off-hook

- a. the called digits are outpulsed to the far end,
- b. the far end returns a sustained off-hook when anispill is required,
- c. the calling digits are outpulsed.

- Wink

- a. the called digits are outpulsed to the far end,
- b. a wink (momentary off-hook) is returned when anispill is required,
- c. the calling digits are outpulsed,
- d. TRUE answer (off-hook) is returned if the call is answered.

* CAMA operation is eligible for ATD answer detection.

Note: If anifail occurs and the call is routed to an operator, the voice of the operator will cause answer to be recorded.

Package NTX102AA04 IBN - STATION MESSAGE DETAIL RECORDING

Feature set ADMINISTRATION
Feature AMA FAILURE ROUTING OPTIONS
Feature no F2475

FUNCTIONAL DESCRIPTION

1. BACKGROUND

The objective of AMA system is to record billing details of all chargeable calls onto a device (tape or disk).

During the call, most of the call-processing agencies store information about the call in the CCB. When the call ends (disconnects) the agency will get a recording-unit extension block, and copy the billing information to it. Then the recording-unit extension block is detached from the CCB and put on the EXT queue.

The AMA process periodically checks the EXT queue. If the EXT queue is not empty, then the data in the EXT queue is formatted into a specified layout (NT, ATT or SMDR format) and stored in a 2048-byte buffer. When this buffer is full it is written to the AMA device (tape or disk).

During the above process of recording charge information, the following cases might happen which will result in charge free calls. This feature provides routing options which can be used to charge toll calls during AMA problems/failure.

- 1) No AMA devices (or files) are available.
- 2) No recording-unit extension block is available.
- 3) An AMA process traps due to software bugs. At present, after fixing the problem a warm restart is required to recover the AMA system.

2. FEATURE DESCRIPTION

2.1 Type of Office

This feature will apply to DMS-100, DMS-100/200, DMS-200 switches only.

2.2 The Proposed Routing Options

The following illustrates the proposed different routing options under AMA failure for different DMS office configurations.

i) DMS-100 (LAMA) office or DMS-100/200 (LAMA/CAMA) combined office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

ii) DMS 200 (CAMA) office

AMA Failure Routing Options

- a) route to an announcement/tone
- b) route call free of charge
- c) route to TOPS/TSPS

iii) DMS TOPS office

The present TOPS handles CAMA failure cases as follows:

a) due to no CAMA TOPS recording units:

The way TOPS handles CAMA call is to get a CAMA TOPS recording unit before collecting calling numbers. If the recording unit is not available, the call is blocked and routed to a treatment.

b) due to no devices(files) or process dead:

The call will be routed free of charge.

In case of condition (a), the calls will now be pegged under the AMAROUTE om register.

In case of condition (b), the calls will now be pegged under the AMAFREE om register.

No other changes will be made in the TOPS call handling because of the existing TOPS call processing design.

AMA restart process command will apply to the TOPS AMA process (see MM section for AMARESTART command).

3. ALARMS AND LOGS

If AMA failure is detected, both DIRP and OFFICE ALARM subsystem will generate alarms with log reports.

3.1 MAP Alarm Indications

The alarm indications will be displayed under IOD and EXT at the MAP MTC subsystem for the following failure cases (as defined in section 1) :

	IOD	EXT
a. no active file available:	NO AMA 3C3	1 CRIT 3C3
b. no recording unit:	AMA B 3C3	1 CRIT 3C3
c. process dead:	AMA B 3C3	1 CRIT 3C3

If there were more than one failed cases happened, the EXT and IOD MAP alarms will be cleared only if all the failed cases are recovered. Telco should check the DIRP logs for failed reasons.

3.2 Logs

There will be two logs: DIRP101 and EXT108 generated for AMA failure. Each failed case is indicated in DIRP101 log with stream name in SSNAME and failed reason in TEXT.

Only one EXT108 log showing AMAFAIL ON is available even though there might be more than one failed cases and only one EXT108 log showing AMAFAIL OFF is available when all the failed cases have been recovered.

Package	NTX102AA04 IBN - STATION MESSAGE DETAIL RECORDING
Feature set	ADMINISTRATION
Feature	ANI INFORMATION IN SMDR OUTPUT
Feature no	G0118

Synopsis

This feature eliminates the cross-referencing effort previously required at the billing processing center.

Automatic Number Identification (ANI) information in the Station Message Detail Recording (SMDR) output now provides an office option. This option causes the customer group number to be replaced with the actual line number in the SMDR record for calls coming in over Automatic Identification of Outward Dialing (AIOD) trunks.

Implementation

Table OFCVAR has new office parameter ANI_IN_SMDR. ANI_IN_SMDR is set to 'Y' to show ANI information in the SMDR records.

If ANI_IN_SMDR = 'Y', then log AMAB150 field ORIG_TYPE has new value 8 for originator type AIOD.

If ANI_IN_SMDR = 'Y', then SMDR record fields ORIGTYPE and ORIGID contain ANI information rather than VFG ID from Table VIRTGRPDS.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

The NT2X01AA AIOD receiver is needed to implement this feature.

Limitations

This feature works only in switches where PBX trunk, PX or P2, or IBN trunk, IBNTI or IBNT2, is equipped with the AIOD feature.

This feature is activated only for operator-assisted AMA billable calls.

Reference: FDOC AF1454

NTX103AA09 Status: RTM IBN - SMDR ENHANCED

IBN	:	
ACCOUNT CODE/ACCEPTANCE AND RECORDING		F0423
ATTENDANT CALL DETAIL ENTRY		F0424
DIRECT INWARD SYSTEM ACCESS (DISA)		F0758
AUTHORIZATION CODES VERIFICATION AND RECORDING		F0759
ESN	:	
AUTHORIZATION CODES		F1751
IBN	:	
SEPARATED OUTPUT FILE FOR IBN SMDR AND AMA		F2368
SEPARATE SMDR OUTPUT FILES BY CUSTOMER GROUP		F2399
SERVICES	:	
AUTHORIZATION CODE IMMEDIATE DIALLING		F2524
IBN AUTH CODES FOR ALTERNATE ROUTE SELECTION(ARS)		F2822
ENHANCEMENTS	:	
DISA CALL PROMPTING DEFAULT DESTINATION		F2969
IBN	:	
INCREASE AUTHCODES PER CUSTOMER GROUP		F3797
SERVICES	:	
AUTHO - CODE CORRECTION		F3931
DISA REMOVE AUTHCODE TIMEOUT		F3932
DISA ROBUSTNESS		F7063

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	IBN
Feature	ACCOUNT CODE/ACCEPTANCE AND RECORDING
Feature no	F0423

FEATURE SYNOPSIS
-----F0423-Account Code/Acceptance and Recording

The account code feature allows a user to enter a billing number into an SMDR record for charge back purposes to various departments, clients, etc. The subscriber's class of service can't be changed using this feature.

F0424-Attendant Call Detail Entry

This feature provides the attendant the ability to add an Account Code, an Authorization Code or the calling number on the call detail recording for station originated calls, answered incoming calls, attendant originated calls and conference calls.

FEATURE DESCRIPTION

Package NTX103AA09 IBN - SMDR ENHANCED
Feature set IBN
Feature ATTENDANT CALL DETAIL ENTRY
Feature no F0424

DESCRIPTION

THIS FEATURE ALLOWS THE ATTENDANT TO ENTER CUSTOMER INFORMATION INTO THE SYSTEM. FEATURES WILL INCLUDE

- ORIGINATING STATION IDENTIFICATION - DIGITS DIALLED - DATE AND TIME OF CALL - DURATION OF CALL - CALLED DN IDENTIFICATION - TRUNK TYPE USED BY GROUP - SPECIAL DISPOSITION OF CALL (E.G., "0" OR INTERCEPT) - NUMBER OF CALLS PER STATION

Package	NTX103AA09 IBN - SMDR ENHANCED		
Feature set	IBN		
Feature	DIRECT INWARD SYSTEM ACCESS	(DISA)	
Feature no	F0758		

FEATURE SYNOPSIS

This feature enables selected outside callers the capability to dial from the switched network directly into the DMS-100 and gain complete access to network facilities without attendant assistance.

The caller dials a 7 or 10 digit DISA directory number or an Inwats DISA number to access the DMS-100. Automatic answer is provided to the caller prompting him for an Authorization Code and the called number. On receipt of a valid Authorization Code and called number the call is completed.

FEATURE DESCRIPTION

Package	NTX103AA09 IBN - SMDR ENHANCED		
Feature set	IBN		
Feature	AUTHORIZATION CODES	VERIFICATION AND REC	
Feature no	F0759		

FEATURE SYNOPSIS

This feature will use the Authorization Code dialed by a user to:

- identify an authorized user of the network and exclude unauthorized users.
- record an Auth Code in the SMDR record for billing purposes, analysis, etc.
- assign a class of service designation to a person rather than to a station or incoming trunk group.

FEATURE DESCRIPTION

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	ESN
Feature	AUTHORIZATION CODES
Feature no	F1751

FUNCTIONAL DESCRIPTION

SYNOPSIS

ESN authorization codes provide cost control and network access control in the following manner:

An IBN/ESN subscriber may enter an auth code voluntarily at the beginning of the call as user identification so that services denied to the station may be made available to the subscriber. However, if the subscriber chooses not to identify himself first, the switch may demand an auth code on the recognition of certain digits in the called number.

In addition to auth codes, the subscriber may enter an account code voluntarily or compulsorily. The account code is for billing only. It does not affect call privileges.

INTRODUCTION

The subscriber of an IBN/ESN switch can dial in an authorization/account code voluntarily prior to the called number, or compulsorily upon the receipt of auth/acct code prompt after the called number.

1. Voluntary Auth/Acct Code

The voluntary auth/acct code feature, which is also known as Auth/Acct Code Unconditional First, has been implemented in feature V0494 and V0493 respectively. However, these features restrict the signalling types of auth/acct digits from incoming trunks to be DTMF only. The design intent here is to retain whatever is available in feature V0493 and V0494 and to lift the restriction on signalling types. Users of these features should, therefore, refer to the associated design intent document for full details and refer to section 5 of this document for enhancement.

2. Compulsory Account Code

The compulsory account code feature, which is also known as Account Code Conditional Last, has also been implemented in feature V0493. The design intent here is to retain whatever is available in feature V0493 and to include the following enhancements:-

* lift the restriction on signalling types (section 5),

* add optional announcement to account code last prompt (section 4),

- * use flexible treatment for invalid account code last (section 6), and,
- * make this feature a customer group option (section 8).

Users of this feature should refer to the associated design intent document for full details and refer to the relevant sections of this document for enhancements.

3. Compulsory Auth Code

The compulsory auth code feature, which is also known as Auth Code Conditional Last, will be the major concern of this document. This document will be structured to describe this feature and enhancements to the preceding features will be stated where appropriate.

Understanding of this document requires the knowledge of the following existing features:-

- * V0463 Station Message Detail Recording (SMDR)
- * V0493 Account Codes
- * V0494 Authorization Codes
- * V0508 Direct Inward System Access (DISA).

The feature here will not comply with "Commercial Specification For SL-100 Requirements For Electronic Switched Network" in the following manner:

Item 3.1.9.8 Attendant Input of Auth Code
Prompting the attendant for an auth code will be implemented in BCS 14.

This document does not address the Auth Code Administration portion of item 3.1.9.9 of the above specification. It is described in feature C0737. C0737 is not a BCS12 feature. In BCS12, administration is via the DMS Table Editor.

FEATURE DESCRIPTION

The auth code last feature will be invoked on the basis of the datafill in the digit translator and it can be used to:-

1. control access to the network

When an auth code is prompted for by this feature, only the caller who can dial in a correct and active auth code will be allowed to proceed. All calls from unauthorized users will be routed to treatment.

2. raise or lower the call's NCOS

As soon as the auth code is validated, its associated NCOS will prevail from that point onward and other features like ERWT, CBQ, and OHQ may follow.

The full advantage of this NCOS change may be achieved if the called number is datafilled to go through translation again.

3. identify the caller for billing

This feature will always generate a SMDR record with the caller's auth code in it. The expense incurred by the call can then be charged back to the originator of the call.

A cost control feature has been implemented in V0493. Its account code last option achieves the effect of identifying a number which is meaningful to the customer for billing. The design intent of the feature here is to provide a feature similar to the account code last feature with the added values described in (1) and (2) above.

CRITERIA FOR PROMPTING AN AUTH CODE

The calling subscriber will be prompted for an auth code (last) if the following criteria are satisfied:-

- * the calling station's NCOS has ACR option,
- * the digit translator has its ACR boolean asserted,
- * the calling subscriber has not entered any auth code, and,
- * the calling subscriber has entered the called number.

The ACR option in NCOS and ACR boolean in digit translator will be used to indicate Auth or Acct Code Required. In order to interpret these options, information at the customer group level is required. This piece of information indicates whether ACR should be interpreted as Auth Code Required or Account Code Required.

For Direct Outward Dialling (DOD) call types, if a customer group chooses the SMDRB option, the ACR boolean in the digit translator will be suppressed for all non-billable DOD calls.

AUTH/ACCT CODE REQUEST PROMPT

The following prompts will be provided for the auth/acct code last feature:-

1. announcement followed by special dial tone

One or more cycles of announcement will be provided so that the announcement may be made in more than one language,

2. special dial tone only,

Special dial tone consists of the following two parts:-

* three 100ms bursts of dial tone separated by three 100ms intervals of no tone, and,

* continuous dial tone.

The dial tone is 350 and 440 Hz of continuous tone.

Choosing which one of the above two prompts to use for a call will be based on the calling station's NCOS.

AUTH/ACCT DIGITS COLLECTION

1. Digit Collection During Announcement

Digit collection will start as soon as the announcement commences: the user can input his auth code at any time afterwards. On the reception of the first digit, DMS-100 will acknowledge by removing the announcement or tone whichever is currently being provided. To allow the subscriber to finish listening to the announcement, long first digit timeout will be used. The duration will be equal to the announcement duration plus permanent signal timeout. It should be noted that this results in an unusually long holding time for the DTMF receiver. For subsequent digits, partial dial timeout will be imposed. The expiry of inter-digit timeout or reception of octothorpe (#) will be used as the indication for end of pulsing.

Note. The sum of announcement duration and permanent signal timeout should be less than 40 seconds.

2. Digit Collection From Incoming Trunks

If the calling subscriber from a distant trunk invokes the auth/acct code first feature, two digit streams consisting of auth/acct code followed by the called number will be sent to DMS-100. DMS-100 will accept the two streams in the same or different signalling types provided that:-

- * the signalling type is either DP or DTMF, and,
- * each digit within its own stream is of the same signalling type.

If the calling subscriber from a distant trunk is prompted for auth/acct code last, DMS-100 will accept DP or DTMF auth/acct digits irrespective to the signalling types of the called number.

USER DIALLING AND DMS RESPONSES

The following are examples showing the interactions between the calling subscriber and the DMS-100 machine:-

1. Station NCOS has auth option, the ACR boolean is set by translation.

```
rdt <called number> acrp <auth code>
```

2. Station is active on a two port call and flashes. Item (1) above applies to the second leg of the call.

```
sdt <called number> acrp <auth code>
```

3. Station has dialled a DISA DN belonging to another customer group. Both station and DISA are terminated on the same DMS-100. Item (1) above applies to the call.

```
rdt <disa number> acrp <auth code>
```

The auth code here is for the originating customer group (see also Feature Interaction).

4. The customer group has the combined auth/account option and item (1) above applies to the call.

```
rdt <called number> acrp <combined auth/account code>
```

5. A user served by another switch (typically a PBX) has accessed DMS-100. Based on translation of digits impulsed and the incoming trunk group's NCOS, the user is prompted for an auth/acct code (last). In this case, all auth/acct code digits must be DP or DTMF.

Examples of this case are available in DID V0493 Account Codes section User Dialling and DMS-100 response item 8.

The type of impulsing (DP,DTMF) is independent of that used for the called number. If the originating office is capable of staying in the dial repeating mode, the digits will be received in DP. If not, the digits will be received in DTMF if the user has a DTMF set or a DTMF autodialer, etc. There are various ways a user can cause the originating office to drop off repeating of dial pulses or converting DTMF signals to dial pulses. Once DMS-100 connects a DTMF receiver to collect an auth/acct code, the entire

code must be received in either DP or DTMF, not a combination of these signalling types.

6. A user served by another switch has accessed DMS-100. DMS-100 receives the voluntary auth/acct feature access code, e.g. 1XX. DMS-100 will return special dial tone. User dialling and DMS-100 response are:

sdt <auth/acct code> rdt <called number>.

In this case, <auth/acct code> and <called number> can be in DP or DTMF.

Legend

< > contains the digits dialled in by the subscriber,

rdt denotes regular dial tone,

sdt denotes special dial tone,

acrp denotes auth code request prompt.

When an incorrect auth/acct code (last) is detected, DMS-100 will respond with a treatment to the calling subscriber and a log message to a designated printer. The type of treatment will depend on the datafill in the customer group level. The log messages will be the same as those detailed in DID V0494 Authorization Codes section Auth Code Feature Abuse.

It should be noted that the use of flexible treatment for incorrect account code last is one of the enhancements to feature V0493.

FEATURE INTERACTION

A DMS-100 switch can have both the auth code last and account code last features. However, a customer group can have either the auth code last or account code last feature, but not both. This is because both features require the use of the ACR boolean in the digit translator.

Although the auth code last feature may look very similar to the account code last feature, the former will not have any relationship to the rest of the account code feature. For example, the availability of account code via voluntary entry will not affect the prompting of auth code.

If the customer group has the combined auth/account code, the account portion should also be entered when this feature prompts for an auth code.

If a subscriber voluntarily enters an auth code which turns out to be invalid, feature v0494 discards the auth code and allows the call to proceed with the calling station's NCOS. In this case, the subscriber is still considered as not having entered an auth code, and if the prompting criteria are satisfied, the auth code last feature will be invoked.

If a subscriber initiates a DISA call to another customer group from a station which terminates on the same switch as the DISA line, the subscriber may be prompted for the auth codes two times. The first auth code is required by the originating customer group and the second auth code is required by the terminating customer group. The former may be prompted by an optional announcement followed by the special dial tone and the latter is always prompted by the special dial tone only. The two auth codes may be different as their validation will be based on each customer group's database.

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	IBN
Feature	SEPARATED OUTPUT FILE FOR IBN SMDR AND AMA
Feature no	F2368

FEATURE SYNOPSIS

This feature separates, SMDR and LAMA output records. These output records can be stored on disk or tape, or can be pulled from a remote locations.

FEATURE DESCRIPTION

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	IBN
Feature	SEPARATE SMDR OUTPUT FILES BY CUSTOMER GROUP
Feature no	F2399

FEATURE DESCRIPTION

This feature allows separation of SMDR data by IBN Customer Group for a limited number of customer groups (up to 12 in the proposed implementation). This will allow large IBN customers to process their own data, which could be sent to them on tape or over a datalink.

INTRODUCTION

This feature is an extension of the capabilities offered by Feature R0368 (Separate Output Files for SMDR and AMA). R0368 allows two independent call data streams to be defined, and a choice of which call data types are to be stored in each stream.

A 'call data type' is the kind of call recording data that a particular feature generates. This includes CAMA, LAMA, SMDR etc.

A 'call data stream' can be thought of as a data file and its associated characteristics (eg. its physical location and name, its backup device, the types of records to be stored, etc).

The physical characteristics of a stream are given in tables DIRPPPOOL and DIRPSSYS (see NTP 297-1001-312). Table CRSFMT gives the overall format of the stream (eg. the format of block headers, restart records, etc.), and table CRSMAP gives the call data types that are to be stored in each stream (see NTP 297-1001-451).

SEPARATE SMDR FILES BY CUSTOMER GROUP

In feature R0368, the call data types were all statically defined (CAMA, LAMA, SMDR, etc). This meant that ALL SMDR records could be stored separately from LAMA records, but no finer resolution was possible.

The intent of R0399 is to allow call data types to be assigned to customer groups, so that the SMDR records for a given customer group can be stored in a separate stream.

Therefore, a new Customer Group Table option will be defined, called SMDRCDT (SMDR call data type). The user will be prompted for a call data type (as datafilled in table CRSMAP). This call data type can be routed to a new stream, as defined in tables CRSFMT and DIRPSSYS.

Several call data types can be mapped into the same data stream, so that a set of customer groups can share a stream, if desired. Any customer group without the SMDRCDT option would default to using the SMDR call data type.

An example of the datafill required to allow a separate stream for customer group 'ABC' is given below. The tables must be datafilled in this order, and a warm restart is required to activate a new subsystem in DIRP.

TABLE CRSFMT
SMRA SMDRFMT

(SMDRFMT is documented in NTP 297-2001-119.)
(DIRP has a 4 character maximum for subsystem names)

TABLE DIRPPPOOL
SMRAPOOL ...

(this defines a pool of devices for the SMRA files)

TABLE DIRPSSYS
SMRA SMRAPOOL ...

(this defines file names, failure alarms, etc)

TABLE CRSMAP
SMDRFORA SMRA

(this defines a new call data type, 'SMDRFORA'. Records of this type will be sent to stream SMRA).

TABLE CUSTGRP
ABC ... SMDRCDT SMDRFORA ...

(SMDR records produced because of originations by lines, trunks, or attendant consoles in group 'ABC', will be labelled as having call data type SMDRFORA. At disconnect time, the record is sent to the stream derived from CRSMAP for tuple SMDRFORA)

DATA STORE IMPLICATIONS

There is a maximum of 24 user-definable call data types, and a maximum of 12 user-definable call data streams, subject to the maximum of 16 DIRP subsystems, as discussed in the Design Description section. However, an important factor to bear in mind when considering this feature, is that defining a disk volume has a 3K byte store overhead in the CC. Opening a file on that volume has an additional 3K overhead. Also, each AMA process has a 2K buffer into which it writes records (the buffer is written to the device via DIRP). Therefore, if each stream has a backup device on a different disk volume, then each stream will require at least 14K bytes of CC store. For the equivalent files on tape there is an 7k byte overhead in the CC for each stream (2.5k for each tape drive, and a 2k buffer).

POLLING SMDR DATA

The IBN customer may wish to process data on tape, in which case it may be recorded directly on tape or dumped periodically from disk to tape. Eventually some customers may wish to poll the data over a DATAPAC link. This will be possible in BCS-11, but security measures to prevent non-telco customers from accessing anything but their own data are not within the scope of this feature. Modifications to the customer's downstream processor to allow polling and processing of SMDR data are the customer's own responsibility. Any necessary design information and reasonable coordination in testing will be provided by BNR on request.

j
j
j
j
Enhanced polling capability for users without access to DATAPAC will be provided by the Universal Datalink Controller. A development estimate for this project is being prepared by Tom Brown. This project is not yet funded, and will not be available before 1984.

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	SERVICES
Feature	AUTHORIZATION CODE IMMEDIATE DIALLING
Feature no	F2524

FEATURE SYNOPSIS

As soon as an IBN/ESN subscriber dials a correct auth code, including security code, this feature assumes that no more auth code digits will be dialled and it proceeds immediately to the next stage of the call process without awaiting octothorpe (#) or inter-digit timeout. On the other hand, as soon as the IBN/ESN subscriber dials an incorrect auth code, this feature continues to collect digits and proceeds to the next stage of the call process only at the reception of octothorpe or expiry of inter-digit timeout.

Introduction Authorization code features (V0494 and V0783) involve the reception of auth code digits and called address digits. These features collect digits until the subscriber explicitly signals the end of dialling by keying in octothorpe (#) or awaiting the expiry of inter-digit timeout. This scheme is suitable for customer groups most of whose telephone sets are digitone (DT) instead of dial-pulse (DP): the former can produce octothorpe and the latter cannot. However, certain customer groups extensively use DP telephone sets and it may be desirable to provide a customer group option which eliminates the timeout or octothorpe appending each digit stream in the auth code features.

This feature document is devoted to the description of the optional digit collection scheme which eliminates the timeout-or-octothorpe requirement within the auth code features. Users should refer to the following design intent/feature documents for details of auth code features:-

- * V0494 Authorization Codes
- * V0783 ESN Authorization Codes.

The digit collection scheme detailed in this feature document will not apply to the following features:-

- * Direct Inward System Access (DISA) V0508
- * Account Codes V0493
- * Account Code enhancements detailed in ESN Authorization Codes V0783.

Feature Description The subscriber of an IBN/ESN switch can dial in an auth code voluntarily prior to the called number, or compulsorily upon the receipt of auth code prompt after the called number. For voluntary auth code, the call stays in the auth code feature until all digits in the called number are also received and translated.

If the SEC field of the AUTH option in table CUSTGRP is set to "Y" (true), this feature is invoked and the following procedures will be used for digit collection:-

* Reception of auth code

The peripheral module will be instructed to report to this feature as soon as all auth code digits (excluding security code) are received. If the auth code is found to be correct, this feature can decide whether to collect more digits or not. These digits include security digits and account code digits (if combined). As soon as all these digits are received and found to be correct, this feature proceeds immediately to the next stage of the call process, i.e. send dial tone for called number or route the call to its destination.

j If the auth code or security code is incorrect, this feature will revert
j to the digit collection scheme which collects until timeout or octothorpe. This makes illegal attempts take a longer period of time.

This feature will be implemented by changing only the central control software, hence it will operate under the constraint of current peripheral firmware. The following inter-digit timing will be exhibited:-

- line module

j All auth code digits will be received with long timeout. Should more dig-
j its (i.e. security code and/or account code digits) be required after-
j wards, the following rule will apply:-

j 1. the very first digit which follows the last auth code digit will be re-
j ceived with short timeout, and,

j 2. all digits subsequent to the digit mentioned in (1) above will be re-
j ceived with long timeout.

- trunk module

The first auth code digit will be received with long timeout and all subsequent digits will be received with short timeout.

* Reception of called number At this stage, the auth code features should have obtained a valid or invalid auth code. If the auth code is correct, the associated NCOS is retrieved, otherwise, the original NCOS is retained. In either case, the digit collector table name (DGCOLNM) of the current NCOS will be used to collect the called number. Should the digit collector table name be nil (NDGT), the DGCOLNM field in table CUSTGRP will be used.

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	SERVICES
Feature	IBN AUTH CODES FOR ALTERNATE ROUTE SELECTION(ARS)
Feature no	F2822

FEATURE SYNOPSIS

This feature provides the capability to allow an Integrated Business Network (IBN) originator (line) to use authorization code to overcome call blockage during automatic route selection (ARS) when that blockage occurred due to a lack of trunking facilities. The caller is prompted for an authorization code during call set up. This feature is applicable to Meridian digital centrex and SL-100.

FEATURE DESCRIPTION

The caller dials a calling number and the switch attempts to route the call based on the NCOS associated with the originating station. If a call blockage then occurs due to insufficient trunk facilities, the following two conditions must be met prior to the subscriber receiving the auth code of ARS prompt.

- Facilities must be available to route the call.
- The customer group must be assigned the auth code for ARS option and the NCOS associated with the originating station must allow the auth code for ARS.

If both conditions are not met, reorder is returned. Otherwise, announcement and/or recall dial tone is given as a prompt for the user to input an auth code. After the caller enters an auth code, it must be validated and its associated NCOS must be one of the NCOS's that is allowed for the route in order for the call to actually be routed.

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	ENHANCEMENTS
Feature	DISA CALL PROMPTING DEFAULT DESTINATION
Feature no	F2969

FEATURE SYNOPSIS

This feature allows a Direct Inward System Access (DISA) timed-out call to be routed to a user-defined destination, rather than having the call default to the Attendant Console. If the user dials no digits upon receiving dial tone from DISA, the call is directed to the user-defined route.

FEATURE DESCRIPTION

The selector RTEOPT in field DISAOPT of Table WRDN allows the user to specify a destination in the case of a call timing out.

Upon dialing into DISA, a dial tone is returned to the caller. If the incoming caller does not dial any digits, the RTEOPT field of Table WRDN is checked to see if a user-defined route has been designated. At this point, the call is either routed according to the user-defined destination or the call is routed to the Attendant Console.

Ref: FDOC AD0729

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	IBN
Feature	INCREASE AUTHCODES PER CUSTOMER GROUP
Feature no	F3797

FEATURE SYNOPSIS

This feature will increase the capacity for authority codes within a customer group from the current 32000 to 64000 auth codes.

FEATURE DESCRIPTION

Auth codes are a set of digits dialed by a user and serve the following purposes:

- a) Identify an authorized user of the network and exclude unauthorized users.
- b) Record an auth code in the SMDR record for billing purposes, analysis etc.
- c) Assign a class of service designation to a person rather than to a station on incoming trunk group.

Auth codes can be from 2 to 10 digits in length. An NCOS is assigned to each auth code. Provision must be made for any and/or all customer groups to use auth codes. The number of auth code digits and the maximum number of auth codes must be determined for each customer group. Auth codes need not be unique to a customer group.

Theoretically, there could be well in excess of several million auth codes, but the practical limits are determined by the available data store.

The allowable number of auth codes is restricted by the amount of available data store. The maximum number is set to 1,000,000. Beyond this, auth codes of less than 6 digits are limited by the number of digits. For 9 and 10 digits the combinations of the first 6 digits cannot exceed 64,000. This still allows 1,000,000 consecutive auth codes.

Data store requirements are affected by the auth code length, the maximum number of auth codes, and the spread of auth codes, ie, random or consecutive distribution. Random distribution is defined as the greatest spread over the range of possible auth codes. Estimates for consecutive distribution are based on auth codes that are entered in sorted order.

To calculate approximate data store, $maxsize = \text{maximum number of auth codes}$, and $ds = \text{data store required}$.

Reference: FDOC BC1252

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	SERVICES
Feature	AUTHO - CODE CORRECTION
Feature no	F3931

FEATURE SYNOPSIS

The purpose of the authorization code error correction feature is to provide callers using DTMF sets or SL-100 electronic telephone sets with a method of correcting keying errors while entering an auth code without having to repeat the whole keying process. Redialling begins at the beginning of the auth code digits only. A unique key, the asterisk will be used to restart the auth code entry process except on the attendant console.

FEATURE DESCRIPTION

Authorization codes allow access to the network with the network class of service (NCOS) that is assigned to the particular auth code. The auth code's NCOS overrides the originating NCOS which has been automatically assigned to the set the user is dialing from through datafill. If the user inputs an invalid auth code, the call reverts to the originating NCOS. If the originating NCOS does not permit the call, a re-order tone is returned.

The dialed digits for auth codes may include security code digits and/or account code digits and may be a maximum of 16 digits.

The auth code itself can be from 2 to 10 digits in length. The dialing format is (auth code).

The auth code can include a 1 to 4 digit security code and in this case, the length will be 3 to 14 digits. The dialing format is (auth code) (security code).

For combined auth/account codes the total digit count is a maximum of 16 digits where the account code can be 1 to 14 digits. The dialing format is either (auth code) (security code) (account code) or (auth code) (account code).

When a user inputs an auth code, the auth code is found in the database based on the auth code part. The auth code part serves as a pointer to the security code. Each auth code part must be unique, within the database, ie, the only variation in the auth code cannot be the security digits.

The auth code, including the security code, is validated. The account code is only checked for the correct length.

Auth code entry (digit collection) is ended by depressing an octothrope (#) or when 16 digits are entered or when a timeout occurs. The length of the timeout is determined by office parameters, `in_long_partial_dial_time` and `in_short_partial_dial_time`, in table OFCENG.

The optional secrecy or no-timeout mode (Ref. R0524) allows a user to receive dial tone immediately after dialing an authcode without waiting for a timeout or hitting the octothrope key as the standard case. This was developed primarily for dial pulse phones which do not have asterisk or octothrope keys and had to wait for a timeout.

Reference: FDOC BV1536

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	SERVICES
Feature	DISA REMOVE AUTHCODE TIMEOUT
Feature no	F3932

FEATURE SYNOPSIS

When a user dials an Auth Code after a DISA DN, the user has to wait for timeout before receiving dial tone to dial the destination number. This feature will optionally remove the timeout after the Auth Code and provide immediate dial tone for entering the destination digits.

FEATURE DESCRIPTION

DISA provides selected outside callers the capability to dial from the switched network directly into the DMS-100 and gain complete access to network facilities without attendant assistance.

The caller dials a 7 or 10 digit directory number or an inwats number which provides automatic answer. The caller then receives special dial tone and then enters an Auth Code and the called number.

The Auth code is entered after the DISA DN. The Auth Code consists of an Auth Code part and a security code part.

Since the length of the Auth Code is not known (until a correct Auth Code part has been entered), it is not possible to return dial tone to the user immediately after the user has finished dialling the Auth Code. DMS-100 waits until the digit collection times out before returning dial tone.

This feature allows the removal of the time out. It will be removed only when the SECRECY field in table CUSTHEAD is set to Y.

Reference: FDOC BV1543

Package	NTX103AA09 IBN - SMDR ENHANCED
Feature set	SERVICES
Feature	DISA ROBUSTNESS
Feature no	F7063

FEATURE SYNOPSIS

This feature will extend the capability of the Direct Inward System Access (DISA) feature software to adapt to additional requirements that are anticipated. For example:

- Private Virtual Networks

A feature set that is sold in the Centrex market to provide Centrex subscribers with the appearance of a private network.

- Call Prompter

A feature to provide during-call prompting to allow the user to interact with a series of announcements and control the progress and destination of a call.

- Per-DISA NCOS

Datafill of an NCOS specific to a DISA DN.

- Per-DISA DN Timeout Values

The specification of a post-authcode timeout value to be associated with a given DISA DN.

FEATURE DESCRIPTION

This feature does not change in any way the operation of the DISA feature. No operational differences will be detected by the subscriber while using this feature.

Package	NTX103BA02 IBN STATION SPECIFIC AUTHORIZATION CODES
Feature set	IBN
Feature	STATION SPECIFIC AUTH CODES
Feature no	F2725

FEATURE SYNOPSIS

Station specific authorization codes (SSAC) provide the capability for limiting the validity of an authorization code (auth code) to a single set. This restriction increases security by verifying that calls are made by the individual who owns a particular SSAC since it will be linked to this individual's station.

FEATURE DESCRIPTION

Station specific auth codes (SSAC) prevent users from randomly accessing auth codes and abusing calling privileges. SSAC users will be able to access privileges provided by an auth code only after the SL-100 verifies the auth code against the particular station from which it was dialed.

This feature enhances previous auth code capabilities by distinguishing three types of auth codes:

1. System Wide Auth Codes
2. Super Auth Codes
3. Station Specific Auth Codes

1. System Wide Auth Codes can be accessed from all stations except those which have SSACs assigned.

2. Super Auth Codes provide the capability for accessing privileges provided by an auth code from any station.

3. Station Specific Auth Codes are valid only when accessed from the station to which they are assigned.

Auth code design provides capabilities for supporting up to 128 customer groups with a maximum of 64,000 auth codes per customer group.

Since it is sometimes necessary to have multiple stations assigned to the same SSAC, due to users needing access from different locations, a maximum of seven stations are allowed per SSAC.

There is a maximum of 10 SSACs that may be allocated for each station. SSACs are incompatible with the DISA feature, multi-line hunt groups, and MADNs. SSACs cannot be applied to MADNs or hunt lines.

Package	NTX103BA02 IBN STATION SPECIFIC AUTHORIZATION CODES
Feature set	IBN
Feature	STATION SPECIFIC AUTHCODE - CDC ENHANCEMENT
Feature no	F6587

FEATURE SYNOPSIS

This feature provides Customer Data Change capability and Servord access to Station Specific Authcode. The main goal of the SSAC CDC enhancement feature is to provide data ownership of station-specific authcodes (SSACs).

In many instances, a number of telco customers want online access to line, trunk and other data on a single telco DMS. With the CDC system, customers can have their own MAPs and use the SERVORD feature and table control to manage purchased resources. Data ownership identifies owners. This way, each online customer can be granted access to data which belongs to other customers, or to telcos. This feature implements ownership of SSACs.

FEATURE DESCRIPTION

The current user interface scheme is improved. Tables KSETFEAT and IBNFEAT will contain SSAC assignments; table SSAC will be discontinued, and the assignment and deletion of SSACs will be supported in the Servord system. This feature standardizes SSACs user interface, to resemble that of other line options. The porting of SSACs from table SSAC to the IBN/KSET FEAT tables results in CDC support as a side-effect, since LEN ownership in those tables is already supported. Since SSACs are fillable in table KSETFEAT, with this feature, it will be possible to assign SSACs to as many DN appearances on a keyset as desired.

This feature introduces the following new user interface effects:

- The SSAC CI increment will perform DN ownership screening.
- The SSAC table will be migrated to tables IBNFEAT and KSETFEAT.
- The SERVORD ADO, DEO and CHF commands will support SSAC management. This way, SSAC maintenance requests can be placed into the same processing stream as any other data feature.

As before, SSACs are incompatible with DISA, multiline hunt groups and MADNs.

Ref:

FDOC AD0938 SSAC - CDC Enhancement
FDOC BR0725 Station Specific Auth Codes

FDOC BV1421 Customer Service Change

NTX105AA03 Status: RTM TRUNK QUEUING

ESN	:	
OFF HOOK QUEUING ENHANCED		F1182
IBN	:	
AUTOMATIC ROUTE SELECTION		F1188
ESN	:	
CALL BACK QUEUING ENHANCED		F1231
IBN	:	
OFF-HOOK QUEUING		F1607
CALL BACK QUEING		F1627
EXPENSIVE ROUTE WARNING TONE		F1629
IBN OFF-HOOK QUEUING OMS		F2735

Package	NTX105AA03 TRUNK QUEUING
Feature set	ESN
Feature	OFF HOOK QUEUING ENHANCED
Feature no	F1182

SYNOPSIS

When an eligible call placed by a station or an incoming trunk cannot be completed because an idle outgoing trunk is not available, it is given Off Hook queue tone or announcement and is then placed in an Off Hook queue for an outgoing trunk. When a trunk becomes available, the call will be completed in the usual manner.

INTRODUCTION

The bulk of the Off Hook Queueing (OHQ) feature has been implemented in V0507 in BCS10. To fully comprehend this document, the reader must first read and understand the DID for V0507. A related queueing feature, Call Back Queueing (CBQ), is covered by V0542 in BCS10 and V0785 in BCS12. To understand IBN queueing properly, The reader is recommended to acquire some knowledge about CBQ. In BCS12, the following OHQ enhancements are added :-

1. OHQ priority.
2. OHQ announcement (OHQA).
3. Discretionary OHQ.
4. Call Back Queueing (CBQ) activation during OHQ tone (OHQT) or OHQA.

Trunks and trunk groups referred in this document can be either physical trunks or virtual facility groups (VFG).

Package	NTX105AA03 TRUNK QUEUING
Feature set	IBN
Feature	AUTOMATIC ROUTE SELECTION
Feature no	F1188

FEATURE SYNOPSIS

This feature allows an outgoing call to be automatically completed by the least cost route available. If the primary route is busy, the ARS feature automatically tries alternate routes. The order of search is specified by the customer and is usually specified from the least cost route as the first choice to the most expensive route as the last choice.

FEATURE DESCRIPTION

Package	NTX105AA03 TRUNK QUEUING
Feature set	ESN
Feature	CALL BACK QUEUING ENHANCED
Feature no	F1231

SYNOPSIS

A station user encountering an all trunks busy condition can opt to be notified when a trunk becomes idle and automatically reaccesses the same number using the Call Back Queueing feature.

INTRODUCTION

The bulk of the Call Back Queueing (CBQ) feature has been implemented in V0542 in BCS10. To fully comprehend this document, the reader must first read and understand the DID for V0542. A related queueing feature, Off Hook Queueing (OHQ), is covered by V0507 in BCS10 and V0784 in BCS12. To properly understand IBN queueing, The reader should acquire some knowledge about OHQ. In BCS12, the following CBQ enhancements are added :-

1. CBQ activation during NCRT announcement.
2. CBQ option 1 as mentioned in Commercial Specification for SL-100 Requirements for Electronic Switched Network (ESN).

Trunks and trunk groups referred in this document can be either physical trunks or virtual facility groups (VFG).

FEATURE DESCRIPTION

CBQ Activation during NCRT Announcement

This enhancement enables CBQ activation when No Circuit Treatment (NCRT) uses announcement instead of tone. During NCRT announcement, the switch hook can be flashed so that special dial tone will be returned. The CBQ access code is then keyed in to activate the feature as in the case of NCRT tone. All other CBQ operations remain unchanged.

NCRT announcement consists of 1 cycle of announcement, where required, another announcement channel can be specified to accommodate the need for unilingual/bilingual announcements.

CBQ Option 1

This CBQ enhancement, known as CBQ option 1, denies a call to search the expensive route set which is denoted by all the route list elements following the first Queue Head pointer (QH). If no idle trunk is available

from the initial route set (all the route list elements preceding the QH), NCRT is given if the call is ineligible for OHQ or when it times out from OHQ. Then, CBQ can be activated in the usual manner.

The expensive route set is not used at this stage to provide better cost control by forcing more calls to use the cheaper routes as often as possible. The CBQ Route Advancement (CBQRA) feature prevents excessive delays during heavy traffic periods by promoting eligible calls to use the expensive route set after the datafillable CBQ Route Advancement Time (CBQRAT) has expired. See V0542 DID for details.

If a CBQ Option 1 call encounters a route list without any CBQ eligible route list elements, it is still not allowed to search the expensive route set. If the caller attempts to activate CBQ after receiving NCRT, he will receive Reorder. At this point, his options are :-

- hang up and re-dial the call with the Auth Code First feature to boost up the NCOS.
- call the attendant for assistance.

Prior to BCS12, the entire route list is searched before NCRT is given for CBQ activation. This method remains and will be known as CBQ option 2. It provides less delay in completing a call, however, the call is more likely to use an expensive route.

Note that CBQ can be activated while the call is receiving OHQ tone (OHQT) or OHQ announcement (OHQA). This is an enhancement available in BCS12. See V0784 FDOC for details.

All in all, there will now be four ways to activate CBQ :-

1. CBQ option 1. The caller can activate CBQ while receiving NCRT after exhausting the initial route set.
2. CBQ option 2. The caller can activate CBQ while receiving NCRT after the entire route list is searched.
3. Expensive Route Warning Tone (ERWT). CBQ can be activated after receiving ERWT which is usually given before the expensive route set is searched. See V0698 for details.
4. OHQT or OHQA. CBQ can be activated after receiving OHQT or while or after receiving OHQA.

Package NTX105AA03 TRUNK QUEUING

Feature set	IBN
Feature	IBN OFF-HOOK QUEUING OMS
Feature no	F2735

FEATURE SYNOPSIS

This feature provides the capability to collect off hook queuing OHQ and call back queuing CBQ operational measurements on a per route basis. A new OM group called OHQCBQRT has been defined. Few more OM's in addition to the existing OM's have been added to the OHQCBQRT group.

The collection of the OM's is provided on a per customer group basis in order to provide the user with a total view of the queuing needs. The collection of the OM's on a per route basis provides a view based on the destination of the calls.

FEATURE DESCRIPTION

The queuing operational measurements are as follows:

a) Off hook queuing OM's:

OHQABN: This OM register is pegged when the calling party abandons the OHQ attempt.

OHQBLOCK: Pegged when call is blocked.

OHQOFFER: This OM is pegged when OHQueuing has been offered to the user.

OHQOVFL: This OM is pegged when an OHQ request cannot be completed due to the lack of queuing resources.

b) Call back queuing OM's:

CBQDEACT: Pegged whenever a CBQ request is cancelled.

CBQDELT: Pegged when deleted because the originator did not answer the call.

CBQOVWRT: Pegged when the CBQ request is overwritten by another request.

CBQOK: Pegged whenever a CBQ request is successful.

CBQRAT: Pegged whenever the CBQ route advance timer for a request elapses.

CBQPPT: Pegged when the call back queuing priority promotion timer elapses.

CBQOVFL: Pegged when queuing resources are not available.

Ref: FDOC BR0735, BDOC BC0738

NTX106AA09

Status: RTM IBN - PROPRIETARY BUSINESS SET

IBN	:	
BUSINESS SET CALL WAITING		F1807
BUSINESS SET END TO END SIGNALLING		F1808
BUSINESS SET 3W CALLING / XFER		F1809
BUSINESS SET LISTEN ON HOLD		F1810
BUSINESS SET ON HOOK DIALING		F1812
BUSINESS SET RING AGAIN FEATURE KEY S/W		F1813
BUSINESS SET SPEED CALLING FEATURE KEY S/W		F1814
BUSINESS SET CALL FORWARD ALL CALLS KEY S/W		F1815
BUSINESS SET CALL PICKUP FEATURE KEY S/W		F1816
BUSINESS SET SERVICE ORDER SYSTEM		F1817
BUSINESS SET AUTOMATIC LINES		F1818
BUSINESS SET MADN SCA (ACCESS SWITCH)		F1819
BUSINESS SET HELD CALLS		F1820
BUSINESS SET IBN BASIC CALLS		F1821
BUSINESS SET POTS BASIC CALLS		F1823
BUSINESS SET AUTO ANSWER BACK		F1826
BUSINESS SET 6 PORT CONFERENCE		F1827
BUSINESS SET MAKE SET BUSY		F1828
BUSINESS SET INTERCOM		F1829
BUSINESS SET CALL PARK		F1830
BUSINESS SET MADN MCA		F1832
BUSINESS SET ADD ON MODULE SOFTWARE		F1833
BUSINESS SET INDIVIDUAL BUSINESS LINE		F1834
BUSINESS SET MALICIOUS CALL HOLD		F1835
BUSINESS SET PRIVACY RELEASE (ACROSS SWITCH)		F1837
BUSINESS SET BUSY OVERRIDE		F1848
SHORT HUNT ON BUSINESS SET		F2720
BUSINESS SETS	:	
AUTOMATIC LINE AND MADN		F2805
SERVICES STATION FEATURES	:	
BUSINESS SET - 36 BUTTON ADD ON SUPPORT		F2864
IBN	:	
BUSINESS SET CALL BACK QUEUING		F3388
BUSINESS SET EXTENSION SETS		F3389
MADN SERVICE ORDERS		F3416
BUSINESS SET GROUP INTERCOM		F3452
BUSINESS SET AUTOMATIC LINE		F3453
BUSINESS SET ADDONS & EXTN FACILITIES MAINTENANCE		F3735
CENTREX	:	
P_PHONE LINECARD		F4411
IBN	:	
ENHANCED SERVORD FOR BUSINESS SET		F5718
PRODUCT	:	
M518 SUPPORT AND INTRODUCTION		F6630
CENTREX	:	
END TO END SIGNALLING		F6809
STATION FEATURE	:	
CALL WAITING ORIGINATION FOR EBS		F7200

DIAL CALL WAITING FOR EBS
MAINTENANCE :
MDC CIRCUIT TEST ENHANCEMENT

F7201

G0063

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET CALL WAITING
Feature no	F1807

FEATURE DESCRIPTION

An incoming call encountering a busy Pphone station receives audible ringing while the called station user receives call waiting notification. The called station user can choose to acknowledge the new caller and place the existing party on hold, to alternate between the callers or to abandon one of the calls.

The basic Pphone call waiting feature will apply to all calls coming into a customer group, as well as attendant extended calls.

This feature can be assigned to one or more DNS on the set. This means that a customer can assign one Call Waiting key for all, or some, of his DNS.

An additional feature, Call Waiting Intragroup can also be assigned on a set/DN basis, to any set/DN assigned the basic Pphone call waiting feature.

Only one call can be Call Waited per Call Waiting key. Calls will not be queued for presentation on a the Call Waiting key.

Feature Activation

Basic Pphone Call Waiting is assigned to a set/DN via Pphone table control. The format of the assignment is specified in the Design Intent Document of Pphone Table Control, C0535.

Feature Deactivation

Basic Pphone Call Waiting is deleted via the Pphone table control. Once removed, Call Waiting Intragroup will also no longer apply to the DN. It is also possible to delete one DN from the group of DNS which the Call Waiting feature applies.

Pphone Key/Lamp Assignment

In order for a Pphone to have Pphone Call Waiting, it must have a Call Waiting key assigned to it. Pphone Call Waiting cannot be accomplished using flashes.

A Call Waiting feature key is associated with any or all the DN keys on a Pphone. This means a user can have one Call Waiting key for all the DNs on his Pphone.

Call Waiting Notification

Pphone Call Waiting notification consists of two 300msec bursts of buzz tone (a tone of 500 Hz., generated locally within the Pphone). It will be applied when a call is first Call Waited and once more 10 seconds later. It will be heard by the called party only.

This tone is optional. If the customer decides not to have the tone notify him that a call is waiting, the Call Waiting lamp FLASHING will be the only indication that a call is waiting. The optionality is assigned on a Call Waiting key basis.

Feature Use

A has Pphone Call Waiting and is talking to B. C calls A. A will receive Call Waiting notification and the Call Waiting lamp will FLASH. C will continue to hear audible ringing.

To talk to C, A will put B on hold by pressing the Hold key and then press the Call Waiting key, which will connect A with C. He may also only press the Call Waiting key, in which case B will be automatically put on hold and A will be connected to C (the lamp next to DN key that B is on will WINK while the Call Waiting lamp will change from FLASHING to ON). While on hold, B will hear silence. To return to B, A will just press the DN key that B is ON. C will be automatically held and the Call Waiting lamp will WINK. A may also put C on hold by pressing the Hold button, and then press B's DN to continue talking with B.

A can abandon either call by pressing the release key or hanging up while being connected to the call. If the Call Waited call is terminated, C will be disconnected, the Call Waiting lamp will turn OFF and the lamp corresponding to B's DN will continue to WINK. If C hangs up at any time, the Call Waiting lamp will turn OFF and the call will be terminated. If A hangs up while talking to B, or B hangs up at any time, the Call Waited call will stay on the Call Waiting key. If another call comes in for the DN, the Pphone will ring and A can put the waited call on hold and talk to the other person by pressing the ringing DN key. Contrary to IBN or POTS CALL WAITING, no ringing will be provided if the controlling party terminates one of the two calls by going onhook. The ringing is intended as a notification of another existing call. Here, the lamp will provide the notification.

Attendant Extended Call

Call waiting has precedence over attendant campon when an attendant tries to extend a call to a busy party that has both call waiting and camp on. In this case, the call will be waited, the attendant is given audible ringing as if it has terminated on an idle line.

No recall timeout will be applied either, ie: if the called party does not answer the waiting call within a certain amount of time, the waiting call will not be routed to the attendant. If the attendant attempts to extend a call to a DN which is busy and already has 1 call waiting, the attendant will hear reorder tone. No campon will be applied.

Feature Interaction

A call will be call waited only if the call state of the line is TALKING.

Call Waiting will not apply to Busy Verification by the attendant.

If the called station has activated Call Forward - Universal or Call Forward - Intragroup, the Call Waiting feature will be disabled for the duration that either of these two features is active. Call Forward Busy and Call Waiting are incompatible. Call Forward Busy has precedence over Call waiting. Call Forward Don't Answer is incompatible with call waiting; a call waited call will not be forwarded if it is not answered.

Call Waiting will not apply to attendant originated calls. If the called station is busy, the attendant will hear busy tone.

The called station will be able to invoke the conference feature from his Call Wait key. This means he will be able to have a conference on his Call Waiting key as well as another conference on his DN key. The only restriction is he cannot conference a call on one of his DNs with the waited call (i.e. call join). Any 6-port conference call will be call waited (P-Phone only).

Call Waiting is subject to called line restrictions. A call will only be waited if the called station is permitted to receive the call type.

Call Waiting will apply to night service type calls. Therefore, if the called station is also a night station, calls placed directly to the station do not have priority over night service calls.

Call Waiting cannot be assigned to any DN which has the 'no double connect' option to it.

Call Waiting and Attendant Camp-on are mutually exclusive. Attendant Camp-on is a customer group parameter and Call Waiting is assigned on a per set/DN basis. If both are applicable to a DN, then call waiting has precedence.

DNs belonging to MADN groups will not be allowed to have Call Waiting.

Feature Requirements

Two options are required. These are the same as with IBN 500/2500 set Call Waiting and are:

- CWT for basic Call Waiting. This can be assigned on a per set/DN basis using Pphone table control.
- CWI for Call Waiting Intragroup. This can be assigned on a per set/DN basis to any set/DN which also has CWT using Pphone table control.

When CWT is deleted from a DN, CWI will also no longer apply. Attendant Camp-On (ACO) will apply, for attendant extended calls, if it is a customer group parameter.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET END TO END SIGNALLING
Feature no	F1808

FEATURE DESCRIPTION

The End to End Signalling feature provides a P-phone the ability to out-pulse Dual Tone Multi Frequency (DTMF) digits while active on a call.

Because End to End Signalling comes as a basic capability on 2500 sets, it is not an optional feature on a P-phone and hence will also be provided as a basic capability.

Feature Use:

Once an established connection has been made from a P-phone to a distant end (including treatments), the P-phone user may perform End to End Signalling by depressing digit keys. All digits received will continue to be outpulsed as long as an actively supervised connection is maintained.

For each digit key depressed 50 msec of DTMF will be outpulsed followed by 50 msec of idle tone. Between the outpulsing of digits PCM will be reconnected. Should the user attempt to release the call before all digits have been outpulsed the release will be delayed until outpulsing has finished. Both user and receivers (all on multilink calls) hear the tones.

Feature Interactions:

End to End Signalling may be performed on any channel related key on which a talking path may be established (eg. CWT, CONF3).

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET 3W CALLING / XFER
Feature no	F1809

FEATURE DESCRIPTION

The feature will allow the P-phone user to include a third party in the call and, then optionally transfer the call to a third party. This feature basically works the same as 500/2500 three way calling.

A call transfer key (CTR) or a three way calling (TWC) key has to be assigned on the P-phone for this feature. The only difference between assigning a CTR key and a TWC key is that the TWC key actually assigns the TWC feature to all the directory numbers on the set. The CTR will provide the feature only if the user has the appropriate call transfer option in the customer group data.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BISINESS SET LISTEN ON HOLD
Feature no	F1810

FEATURE DESCRIPTION

Description

This feature allows a P_phone user put the called party on hold and listen to it through the speaker. The intended use of this feature is so that when the P_phone user himself has been put on hold, he/she may listen through the speaker to determine when the call has been reestablished.

Feature Activation:

- 1) Once a connection has been established to the called party, put it on hold (see DID V0818).
- 2) Put the handset onhook.
- 3) Reaccess the held call. The user may now listen to the called party through the P_phone's speaker.

Feature Deactivation:

- 1) Remove the handset from the cradle.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET ON HOOK DIALING
Feature no	F1812

FEATURE DESCRIPTION

A P_phone user may originate a call by selecting an idle DN and dialing without lifting the handset. Call progress tones and the voice of the called party are heard through the station's speaker. The user may terminate the call by pressing the release key.

Feature Activation:

1. Press an idle DN key and the associated lamp lights.
2. Dial the required DN and progress tones will be heard through the speaker. The called party's voice will also be heard over the speaker upon answer.
3. Lifting the handset will establish a two way connection through the handset.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
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Feature set	IBN
Feature	BUSINESS SET RING AGAIN FEATURE KEY S/W
Feature no	F1813

FEATURE DESCRIPTION

A set that has the Ring Again feature can opt to be notified when a busy number becomes idle, and can automatically reaccess that same number. For example, set A is assigned the Ring Again (RAG) feature and DN1 on that set calls station B. B is busy and DN1 hears a busy tone. A depresses the RAG key, the RAG key lights up and the call is taken down. If no feature restrictions are encountered, DN1 is free to place or receive other calls. When B becomes idle, A is notified by a RAG notification tone and by the winking of the RAG light. The winking of the RAG light lasts for the duration of the notification period. The notification period may be data filled from 8 to 30 seconds, the default value being 8 seconds.

A can then choose to act on the RAG option (pick up the call) or it may allow the RAG notification to time out. Should it choose the latter it will in effect be relinquishing its request for B and would have to dial again to reach, or to restart a RAG request on B. Should A choose the former, (by depressing any free DN key and then depressing the RAG key), station B is rung and A hears audible ringback tone. The feature is completed when station B is receiving physical ringing (regardless of whether station B goes off-hook or not) or when notification is allowed to time out.

Cancellation of the pending RAG request is permitted at any time or state on an SL-100 business set except during RING AGAIN notification. To cancel the RING AGAIN request, the user has simply to depress the RING AGAIN key.

For a better comprehension of this design spec, it is recommended that the reader first read the design intent document (DID) for feature #V0533 (IBN RAG). This document contains an outline of the feature's restrictions and requirements in the IBN environment.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET SPEED CALLING FEATURE KEY S/W
Feature no	F1814

FEATURE DESCRIPTIONBusiness Set Speed Calling Feature Key S/W

The speed call feature allows the user to store frequently dialed numbers against an access code and to make calls to these numbers by entering only the access code. The feature description, except for the operating mechanics peculiar to the key set, is essentially identical to the IBN description.

A p-phone must have a Prime Directory Number (PDN) assigned before the Speed Call (SC) feature can be assigned. Each set may have one speed call short list (SCS), up to 10 entries and/or one speed call long list (SDL) up to 30, 50 or 70 entries. The set may also belong to a speed call user group (SCU), a list of up to 70 speed call numbers is then available to him but they may only be programmed by the set that is assigned the speed call long list used.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET CALL FORWARD ALL CALLS KEY S/W
Feature no	F1815

FEATURE DESCRIPTION

P-phone Call Forwarding (CFX) is functionally identical to IBN Call Forwarding and descriptions given in the following reference apply completely to P-phone.

1. Call Forwarding Universal (CFU) - refer to V0451
2. Call Forwarding Intragroup (CFI) - refer to V0451
3. Call Forwarding Busy (CFB) - refer to V0453
4. Call Forwarding Don't Answer (CFD) - refer to V0452

Call Forwarding on P-phone will be a subset feature, that is it will not necessarily apply to all DN's on the set. When the set is datafilled for Call Forwarding, the user can specify at datafill time what DN keys they wish Call Forwarding to affect. All types of DN keys including MADN DN's and Hunt Group DN's will be able to have the Call Forward feature. MADN DN's will be restricted in that only the set that has the primary MADN member will be able to have Call Forwarding on that DN.

Only differences in the 4 flavours of Call Forwarding will be touched here. CFU and CFI are the only types of CALL Forwarding where any differences for key sets apply, and there only in the programming phase are there any differences.

CFU and CFI Programming and Activation

CFU and CFI are the only user programmable types of Call Forwarding. They may be programmed by using dialled access codes as the 2500 or 500 set in IBN (refer to V0451) can or using the Call Forward key on the P-phone set. When CFU and CFI are programmed using the feature key, the forwarding will only apply to DN keys that have the feature. The feature can't be programmed using access codes from the DN's that haven't got Call Forwarding. If the feature key is assigned programming using access codes will not be allowed. Only programming with the feature key will be discussed here. Programming can only take place when there are no active DN's on the set and when Call Forwarding is inactive (Call Forward light is out). If Call Forwarding is active (light is on), it must be deactivated before programming can take place.

To program, the Call Forward key is depressed and the lamp beside the key will start to flash. The user is then able to key in the number he would

like his calls forwarded to. The programming sequence is terminated by depressing the Call Forward key again. If the digits are stored properly the lamps will go from flashing to steady on. As with IBN there is no validity checking on the stored digits. If the digits were rejected for some reason the call forward light would go out and the programming sequence would be abandoned. Tones are not used as indicators for programming P-phones.

The programming sequence can be abandoned at any time by pressing a Release key or a DN key. In both cases the call forward light goes out and no digits are stored. Most other keys on the set are ignored while programming. If abandoned by a DN key a new origination would start on that DN key with dial tone.

If no digits are dialed the user will simply reactivate the previous number he used to forward his calls. If there was no previous number the set will get reorder tone and the light will remain flashing till the Release key or a DN key is hit. In the case of special digits³ and #, the³ will be stored only if it is the first digit, but the # is treated differently. When the # is hit, no other digits will be accepted for input. The following chart will illustrate what digits will be stored as a result of various keying sequences.

Keying Sequence	Number Stored
CF + 67235# + CF	67235
CF + 672#35 + CF	672
CF + 6 ³ 7 ³ 456 + CF	6
CF + ³ 72 + CF	³ 72
CF + CF	previous call forward number activated
CF + # + CF	clear out previously stored digits

CFU and CFI Deactivation

Call Forwarding is deactivating at any time whether a DN is active or not simply by depressing the Call Forward key. When the feature is deactivated the digits that were used to forward calls are left intact so they will not have to be reentered when the feature is reactivated.

Call Forward Lamp

This lamp has three states:

1. flashing (programming digit collection)
2. on (call forward active)

3. off (call forward inactive)

The on state is an important one because it alerts the user to the fact that some or all of his calls are being forwarded. P-phone will not receive any ring splash when calls are forwarded because the light is used to indicate call forwarding is taking place. Therefore this lamp state will be maintained through power losses since the main or extension set has no memory for lamp states in the event that the set is disconnected.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET CALL PICKUP FEATURE KEY S/W
Feature no	F1816

FEATURE DESCRIPTION

Call Pickup (CPU) allows a station to answer calls incoming to another station within a predetermined Call Pickup group. A Call Pickup group is a group of stations with Call Pickup feature linked together using one of its stations as the primary member.

In key set features, Call Pickup is neither a set nor DN feature. It is assigned to individual key set but only applies to a subset of the DNs of that key set (subset feature).

FEATURE USE

Call Pickup on key set can be activated via an access code or a Call Pickup key. Activation via access code will be identical to IBN and is not considered here (IBN CALLPICKUP DID V0455).

Each key set with Call Pickup feature has a call pickup key assigned as one of its feature keys. To pickup a call, an active channel must be allocated and the call pickup key depressed. Allocating an active channel can be done by either going offhook or pressing a valid DN key on the set.

Access code could be used in place of the Call Pickup key, however, it is not considered here.

DESIGN INTENT

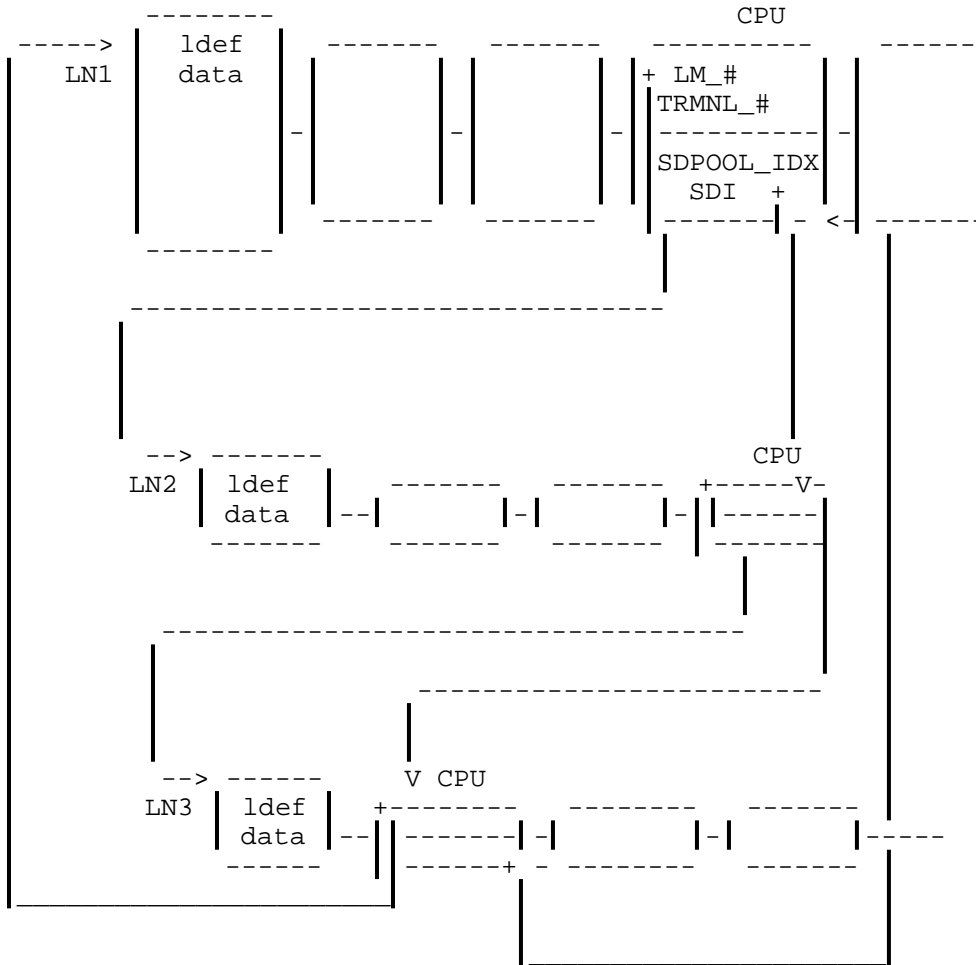
The crucial design criterium in Call Pickup, as in other key features, is to adopt existing IBN feature software with minimal modification.

The software required for Call Pickup can be divided into two areas: table control and call processing. As far as call processing is concerned, a key set line is very similar to an IBN line. Take into account the complexity involved in areas such as feature interactions, it is decided that existing IBN code would be used with slight modification in the activation sequence. Refer to DID V0455 (IBN Call Pickup for Feature Use and Feature Restrictions).

Table Control is responsible for datafilling a Call Pickup group. Key setline data is different from IBN line data as it is addressed via a Vir-

tual Line ID of DNs on each key set. Thus, modification to existing Table Control software is required.

CALL PICKUP DATA STRUCTURE



CPU Items

1. Call Pickup supple data block

- (a) next Call Pickup member's lm_number and Trmnl_number
- (b) supple data index to next Call Pickup member's CPU supple data block

2. Each Call Pickup group is identified by the line Equipment Number (LEN) of one of its member. All subsequent members will use that LEN to be included in the group.

3. A Call Pickup key is a key set function key that is assigned the Call Pickup feature through Table Control Software. In Call Pickup feature access via an access code, the feature will be associated with the primary DN key.

As for the call state, digit collection, translation, and ccf processor activation are completed under call state equals "dialing", so call state consistence is maintained.

It is left to the LGC to prevent feature activation whenever cc call state is not dialing.

TABLE CONTROL

Call Pickup in key sets is different from IBN in 4 ways:

1. It is a subset feature.
2. The Line Equipment Number (LEN) of the key set is used in linking together each call pickup group. Virtual Line ID of each DN on the key set is used only in referencing the def data, and in linking each member within a CPU group.
3. Because DNs on a key set behave like IBN lines, each IBN CPU group can include key sets and each key set CPU group can include any IBN lines.
4. Assignment of features to feature keys must be consistent with the feature data present.

Therefore, modifications to existing Read, Write, and Write_nil procedures regarding data features of IBN Feature Table are required.

In adding or deleting a key set line, the LEN of the key set is used to reference key assignment data to produce Virtual Line_ID of individual DNs to be included or deleted from the Call Pickup group. (Write, Write_nil Procs modification).

The major problem is mixing IBN lines and key set lines in a Call Pickup group.

externally, a call pickup group is identified by the lowest line equipment number (LEN) of its members. We call this the primary member. For example, current IBN Call Pickup has the following table format:

```

HOST   LM   0 0 0 1      CPU   LM   0 0 0 1
HOST   LM   0 0 3 0      CPU   LM   0 0 0 1
HOST   LM   0 0 3 4      CPU   LM   0 0 0 1

```

The reason is that the lowest LEN is used is for Dump and Restore procedure. Dump and Restore is a process with which a DMS switch can restore customer tables across bcs releases.

Key Set Call Pickup allows IBN lines to be included in a Call Pickup group. This will present problems in Dump and Restore. In cases where a Key Set line has a lower LEN than an IBN line, we cannot use the lowest LEN to designate a CPU group as IBN Tables are datafilled before Key Set tables. The solution is to designate the lowest LEN of the IBN member (if one exists) as the primary member in a Key Set CPU group, because:

1. Dump and Restore starts from lowest LEN and up within each table.

2. IBN feature table is datafilled before Key Set feature table.

This solution requires modifications to existing Read procedure for IBN feature in Call Pickup option. If there is no IBN lines in the CPU group, use lowest LEN as primary member. If one or more IBN lines exist, use the lowest LEN of the IBN lines as primary member.

Feature key assignment must be consistent with feature data. The following guidelines must be followed to achieve integrity:

1. CPU can be activated via access code, so CPU on DNS can be datafilled without feature key assignment.

2. Feature key assignment can be completed if and only if at least one of the DNS on the key set has CPU option.

3. Deleting CPU option presents no problem except if the last CPU option on any DNS of a key set is deleted, the feature key must also be deleted.

4. Deleting CPU key must also delete all cpu options on each DN of the key set. Note that this will not present problem with CPU via access code, since the CPU key would not be present. This also implies if CPU activation sequence is changed from key access to code access or vice versa, we must delete all CPU options and add them back individually.

Result: New Table Control format for Key Set Call Pickup, an entry for Call Pickup may look as follows:

```
HOST LCM 0 0 4   CPU LM0 0 0 1   4   5
-----
```

where the last two number refers to DN keys that has call pickup option.

PSEUDO CODE

To delete a key set from CPU group, the following procedure is called in kset_feat_write_nil proc:

```

Delete_key_set_CPU Proc (start line_index) is
BLOCK
  If lm_data {start.lm_no}.line_prot_data {start.trmnl_no}
    .def.format = key_set_line
  then
    4 get all VLENs associated with key set
    4 individually do VID
      delete_CPU (VID) 4 deletes feature and looks after
        linking CPU
    4 Until no more Vlen with CPU option
  Else
    delete_CPU (start);
  ENDIF;
ENDBLOCK,

```

To add a key set line to a cpu group, make existing IBN code into a procedure and do the following:

```

Procedure key_set_feat_write write_data_Proc is
Block
  .
  .
  .
  .
  Case df_rc in
    .
    .
    .
    {valid_kset_feat}:
      If write_kset_feat (data, datainst)
      then
        Return false
      ENDIF;
    .
    .
    .
  ENDCASE;
4 special code for cpu_option in linking lists of CPU data
4 blocks
  Select dp IN

```

```

      .
      .
      {cpu_option}:
      4 get all Vlen associated with key set
      4 individually do
      add_CPU_IN_LINK_LIST (VID)
      4 until no more Vlen with CPU option
      .
      .
      .
      ENDSELECT;
ENDBLOCK;

```

To read a member in the Call Pickup group Procedure READ_LOWEST_CPU_LEN in IBNLNTCI:

```

PROCEDURE Read_lowest_CPU_len PROC
                                (REF cpu_sd ibn_cpu_suppl_data,
                                UPDATES lowest_len line_equip_number)
                                RETURNS BOOL IS

```

```

Block
  cpu_sd.len -> lowest.len;
  cpu_sd -> start -> current;
loop: do
  IF (current.type = IBN)
  then
    IF lowest.type = key_set
    THEN
      current.len -> lowest.len
    ELSE
      If current.len < lowest.len;
      THEN
        current.len -> lowest.len;
      ENDIF;
    ENDIF;
  ELSE
    IF lowest.type = key_set
    THEN
      IF current.len < lowest.len;
      THEN
        current.len -> lowest.len;
      ENDIF;
    ENDIF;
  ENDIF;
  current.next -> current;
Until current = start;
Return true;
ENDBLOCK;

```


Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET SERVICE ORDER SYSTEM
Feature no	F1817

FEATURE SYNOPSIS

The Service Order System has been enhanced to include the P-Phone. The 3 categories of subscribers loop are now:

- POTS
- Data Unit
- P-phone

The enhancement includes:

- service order to handle mlh/dlh/bnn P_phone and data unit hunt lines
- additional P_phone and data unit features

FEATURE DESCRIPTION

All existing Service Order commands will be retained to handle P_phone and data unit lines. All existing checking will apply to p_phone and data unit lines. Thus this feature will cover only the areas that are different from the existing S.O. methods of handling transactions.

Two new line class codes will be created to distinguish p_phone and data unit from other types of service (eg, 1FR):

- pset for p phone
- data for data unit

These LCCs are used in the service order command NEW and command EST and will have their unique refinement fields to identify: custgroup, subgroup, ncos, snpa, ringing and key. Refer to MM section of this DID for examples.

Two additional service order commands will be introduced to handle these features:

- AKO
to add features against a set key
- DKO
to delete features from a set key

Most existing commands are invisible to the users in terms of prompting and expected input. The ones that look different to the users at the MMI level are:

- NEW
- EST
- ADD

The following S.O. commands are not applicable on p_phone or data unit lines:

- NEWDN
- OUTDN
- ADOH
- DEOH
- CLN

The following S.O. commands are not supported in BCS 13 but will be supported in BCS 14. Refer to DID C1085.

- ABNN
- DBNN
- ADO
- DEO

An attempt to use them on p_phone or data unit line will generate system error messages on the user terminal. These messages will indicate that such an attempt is not supported and that what is the appropriate way.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET AUTOMATIC LINES
Feature no	F1818

FEATURE DESCRIPTION

Business Set Automatic Line

The Automatic Dial (AUD) feature allows a P-phone user to call a frequently dialed number by depressing the assigned feature key. The user is permitted to change the assigned number stored against the feature key. The feature is assigned to the feature key via the Service Order System. Before any AUD key can be assigned the set must have a minimum of one directory number.

Programming:

The user depresses the AUD feature key to initiate the programming mode. This will cause the associated lamp to FLASH at 60 IPM. The subscriber enters the number to be stored via a standard 12 key telephone pad. Once the user has entered all the digits required, to exit from the programming phase the feature key is depressed for a second time.

Deleting:

To delete the stored number, the subscriber while on hook will depress the feature key. This will cause the associated lamp to flash. An octothorpe is then entered and the AUD key depressed for the second time to complete the deleting action.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET MADN SCA (ACCESS SWITCH)
Feature no	F1819

FEATURE DESCRIPTION

The Multiple Appearance Directory number feature will provide for a multiple number of line appearances (physical lines or vertical lines on the p-phone) to be associated with a single directory number. Any live appearance sharing the same MADN can originate calls subject to regular IBN line restrictions. When an incoming call is terminating on the MADN, all line appearances are alerted and anyone can answer the incoming call.

With MADN single call arrangement (SCA) the number of calls that can be set up on the group is limited to one. The operation of the feature is almost the same as physically connecting all MADN members to a single copper pair. However, when access to the MADN group is granted to a member, all other members are locked out. Access to a MADN group is granted when a member originates a call on the idle MADN group or answers an incoming call.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET HELD CALLS
Feature no	F1820

FEATURE DESCRIPTION

Description:

A P_phone user can hold an established call on any DN on the P_phone. The user may then originate or receive another call on any other idle DN.

Feature Activation :

- 1) The user has an active call and wishes to hold it and originate or receive a second call.
- 2) Pressing the HOLD key will cause the active DN to be held and have it's associated lamp change from on to winking. Alternatively, the call may be auto held by simply pressing any channel associated key (e.g. DN, CONF, or CWT if there is a call on the callwaiting key).

Feature Deactivation :

- 1) Any held call may be reaccessed by pressing the key associated with the held call.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET IBN BASIC CALLS
Feature no	F1821

FEATURE DESCRIPTION

Introduction -----

This IBN basic call capability allows a pphone to make non featured calls to any IBN destination supported by IBN lines.

Functional Description -----

This capability will allow a pphone to call

- IBN pphone
- IBN 500/2500 set
- IBN trunk
- Attendant Console

The IBN basic call capability will also allow any of the above to call a pphone.

See Pphone-Basic Call DID (C0536) for set operation.

Capabilities not Guaranteed to work -----

The following capabilities will not have any development effort directed to them under this feature:

- attendant control and ringback
- all features - pphone end or other end
- interaction with POTS terminals

Note some aspects of the above may work. No attempt will be made to block nor allow interaction.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET POTS BASIC CALLS
Feature no	F1823

FEATURE DESCRIPTION

Introduction -----

The POTS basic call capability allows an IBN pphone to make nonfeatured calls to any POTS destination supported by IBN lines.

Functional Description -----

This capability will allow a pphone to call

- POTS 500/2500 sets
- POTS coin line
- POTS trunk
- cama trunk
- 0 operator
- 911 operator
- 411 operator

The POTS basic call capability will also allow any of the above to call a pphone.

See Pphone-Basic Call DID (C0536) for set operation.

Capabilities not Guaranteed to work -----

The following capabilities will not have any development effort directed to them under this feature:

- operator control and ring back
- all features - pphone end or other end
- interaction with IBN terminals

Note some aspects of the above may work. No attempt will be made to block nor allow interactions.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET AUTO ANSWER BACK
Feature no	F1826

FEATURE SYNOPSIS

This feature allows any incoming call to the Primary Directory Number of the set to be automatically answered after four seconds of ringing. Conversation takes place through a handsfree unit without manual control. When the calling party hangs up, the call will be automatically disconnected.

FEATURE DESCRIPTION

A feature key may or may not be assigned for the auto answer back. If an AAK is assigned the station user may control the feature. In case the autoanswer back key is provided and no key is assigned, the station will be in permanent automatic answer back.

Auto answer back is activated by depressing the AAB key, an incoming call to the PDN will cause two seconds of ringing tone to be generated and the auto answer back unit will be set on 2 seconds after ringing, simulating an off-hook response. Conversation then takes place via the autoanswer back unit.

To deactivate the feature the AAB key is depressed.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET 6 PORT CONFERENCE
Feature no	F1827

FEATURE DESCRIPTION

This feature allows a P-phone station to establish a conference call up to 30 parties by progressively dialling and transferring potential conferees to the conference call. No operator/attendant help is required, and the P-phone station has direct control over the progress of the conference. There are 7 variations of the maximum size of the conference:

1) conference 6 2) conference 10 3) conference 14 4) conference 18 5) conference 22 6) conference 26 7) conference 30

In each case, the P-phone station is included as one of the conferees. Each potential conferee can be any station inside or outside the custgrp, a line or a trunk.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET MAKE SET BUSY
Feature no	F1828

FEATURE DESCRIPTION

The MAKE SET BUSY (MSB) feature allows directory number (DN) appearances, excluding private business lines and multiple access directory number (MADN) group members, and call terminations, such as call waiting calls, camp-on and busy override, on a P-Phone set to be made busy to incoming calls.

While this feature is active on a set, all incoming calls to DN appearances affected by the feature will receive either busy tone or some other treatment.

Busy tone will be the default, but the customer will have the option of specifying other treatments (tone or announcements) based on the called party's customer group. For intragroup calls blocked by the MSB feature, the calling party will always receive busy tone. Also, the made busy set will receive no indication, either audible or visible, that calls are attempting to terminate on it.

Since this feature only affects call terminations, a made busy set is still free to originate calls from any of its DN appearances. Feature programming will also be possible on a made busy set.

Feature Operation:

The feature is activated when the MSB key on the P-Phone set is depressed while the associated lamp is off, indicating that MSB is currently inactive. This will cause the lamp to be turned on, indicating that the feature is active.

The lamp will remain in the on state as long as the feature remains active, even during call originations from the made busy set. To deactivate the feature, the MSB key is depressed again, while the associated lamp is on, causing the lamp to be turned off.

The feature may be activated or deactivated at any time, even while the set is already involved in a call. However, depressions of the MSB key in the middle of a feature programming sequence (e.g., call forwarding or speed calling) will be ignored.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET INTERCOM
Feature no	F1829

FEATURE DESCRIPTION

The intercom feature allows a customer upon hitting the intercom key to directly terminate upon a predesignated set. If there are no DNSs active on that set then audible ringing is given and the terminator's ICM key lamp begins flashing. The terminator may then choose to answer the call by depressing the ICM key or wait for the two second delay preceding an automatic connection being made. Should any of the DNSs on the terminator's set be in a busy state, a buzzing tone will be given to the terminator's set in place of ringing and there will be no automatic connection made. To answer the call the terminator would then have to depress the ICM key (this will autohold any active DNSs).

Once a connection is established, the originator speaks into the handset. The terminator then hears the message over the speaker. Should privacy be desired or an answer be required the terminator picks up the handset, establishing a two way voice path and disabling the speaker.

Both sets can be datafilled to originate and/or to answer an ICM call on their ICM key.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET CALL PARK
Feature no	F1830

FEATURE DESCRIPTION

The call park feature provides P-phone stations with the capability of holding a call against a directory number appearance in the system, from where it may later be retrieved by any station. The call is actually parked against the directory number of the user having requested the feature such that it may be retrieved from any station by first requesting call park retrieve and then dialing the directory number of the station against a DN appearance in the system, the user is free to originate and receive calls on that DN.

The feature may be divided into two major components: the call park store feature, which enables a user to park calls against his own directory number, and the call park retrieve feature, which enables a user to retrieve parked calls. Any IBN or P-phone station is capable of retrieving parked calls, even though that station may not have the call park feature assigned. On P-phone stations assigned a dedicated call park key, that same key may be used for both parking calls and retrieving parked calls.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET MADN MCA
Feature no	F1832

FEATURE DESCRIPTION

1. Introduction

Multiple Appearance Directory number (MADN) is an SL-100 feature making it possible for a multiple number of line appearances (physical lines or virtual lines on p-sets) to be associated with a single directory number. Any line appearance sharing the same MADN can originate calls subject to regular IBN line restrictions. When an incoming call is terminating on the MADN, all line appearances are alerted and anyone can answer the incoming call.

There are two basic variants of the MADN feature, namely, multiple call arrangement (MCA) and single call arrangement (SCA).

The following terms are defined here and will be used throughout this document.

MADN group - MADN group is a unique number used to identify a group of line appearances sharing the same directory number (MADN). A maximum of 32 line appearances can be assigned to a single MADN group.

MADN member - A line appearance assigned to a MADN group is called a member of the MADN group.

external party - When a call is established between a MADN member and a party outside the MADN group, the outside party is called the external party.

2. P-set with MADN (SCA/MCA) option

A DN key on a p-set (primary DN or secondary DN) can be assigned to a MADN group. The key/lamp with MADN assigned will be called MADN key/lamp throughout this document. The MADN lamp is always updated to indicate one of the following states:

OFF	- idle
ON	- busy (in use)
Flashing (60 IPM)	- ringing
Winking (120 IPM)	- held

3. Mixed sets operations

Mixing 500/2500 sets with p-sets in the same MADN group is possible.

4. Single Call Arrangement (SCA) (FDOC V0954)

With single call arrangement, the number of calls that can be setup on the group is limited to one. The operation of the feature is almost the same as physically connecting all MADN members to a single copper pair. However, when access to the MADN group is granted to a member, all other members are locked out. Access to a MADN group is granted when a member originates a call on the idle MADN group or answers an incoming call.

5. Multi Call Arrangement (MCA)

The operation of this feature is similar to MADN-SCA except individual calls can be set up on all MADN members. MADN members can originate calls independent of the states of all other members. However, an incoming call to the MADN group is presented to all idle members and the first member to access the MADN group is connected to the external party.

5.1 Accessing a MADN/MCA group

A MADN member can originate calls without affecting the state of the rest of the members in the group. However, if a MADN member answers an incoming call, the lamps of all other ringing members are turned off to indicate the new state of the group. Once a member is active in a call, the MADN lamp (for that p-set user) is turned on and the MADN lamps of all other idle members are off.

If no network connection is available between the off hook member and the incoming call then this member will be given re-order treatment and the lamp will go solid. The rest of the group will remain in a ringing state with their lamps flashing.

If there is more than one incoming call and a member goes off hook, that member will be connected to the first incoming call. If a network connection is available, that member's lamp will go solid but the rest of the group will remain in the ringing state with their lamps flashing.

If no network connection is available between the off hook member and the first incoming call, then another incoming call will be connected. If this attempt also fails, then this member will be given reorder treatment and the associated lamp will go solid.

5.2 Presenting Incoming Calls

An incoming call to a MADN MCA group is presented to the group as long as there is an idle member to terminate on. An idle member being one which is not already involved in a call and that is not being terminated on and if it is a 500/2500 set it must have the ring bool in its line data set to true. The maximum number of calls associated with a group at any one time is the number of members in the group.

If an active member terminates an active call, by going on hook or releasing, when there are one or more calls terminating on the group, then this member will be notified (ringing and or lamp going flashing where applicable) if a channel can be reserved. Due to the nature of MADN calls, users may experience disruptions of both physical and audible ringing.

5.3 Holding a MADN call and activating privacy release

A MADN MCA call can be held. However, only the original station can reac-cess the held call. Privacy release is not allowed on MADN MCA group.

6. Feature Interactions

The following features/options and MADNs are mutually exclusive:

- UCD - Uniform Call Distribution;
- CSDDS - Circuit Switched Digital Data Systems;
- PBL - Private Business Line; and
- Hunt Groups, all flavours.

The following features/options interact with MADNs on a per line or per member basis but are handled by existing call processing.

- DOR - Denied origination;
- DTM - Denied termination;
- FNT - Free number termination;
- RSUS - Requested suspension;
- SUS - Suspended line;
- PLP - Plug up;
- DIN - Denied incoming;
- CLI - Calling line identification;
- CLF - Calling line identification with flash;
- COD - Cut off on disconnect;
- 3WC - Three way calling;
- SPB - Special billing.

The following features/options interact directly with MADNs and will be dealt with individually in the following pages.

- CFX - Call forwarding - all flavours;
- CWT - Call waiting;
- RAG - Ring again;
- CPU - Call pick up;
- CPK - Call park;
- TAFAS - Trunk answer from any station;
- SLU - Subscriber line usage;

Do Not Disturb (DND) is incompatible with MADN MCA. All other features/options are compatible or independent of MADNs.

Also as with MADN SCA, a MADN MCA member cannot be barged in on through the use of EXECUTIVE BUSY OVERRIDE (EBO).

6.1 IBN CALL FORWARDING (CFX), all flavours:

Call forwarding is assigned on a per group basis.

Call forwarding is compatible with MADNs but with the following restrictions:

1. The MADN group must have a primary member.
2. The Call forwarding option will only be set on, or assigned to a primary member's line.
3. Call forwarding DN subsets for P-phones cannot include non-primary MADN group members.
4. For the programmable flavours (CFU, CFI, CFUI), only the primary member may program, activate, and deactivate call forwarding for the group.
5. Also for the programmable flavours, only the primary member will receive the ring splash as the call is forwarded.
6. For call forwarding don't answer (CFD) the entire group will be rung for the data filled amount of time before the call will be forwarded.
7. When CFB, CFD, or CFBD is assigned to the primary member's line or when CFU, CFI, or CFUI is activated by the primary member, the entire call is forwarded. i.e. Once a call is forwarded from a MADN group no member of that group may answer that call.
8. When a forwarded call reverts back to a CFD station which is a MADN, then the entire group is re-rung as a normal incoming MADN call.

6.2 Call Park:

Call park will be assigned on a per line or per member basis.

Only the member of the group who parked the call will be re-rung when the "Parking Meter" times out.

Since the call is parked against the DN, only one call may be parked per MADN group.

6.3 Call Pick Up:

Call pick up will be assigned on a per line or per member basis. However, it should be noted that MADN group members are not restricted to belong to the same call pick up group or to belong to any group at all.

Call pick up will behave the same with MADN lines as with any other ibn extended line.

6.4 TAFAS

MADN can serve two purposes with TAFAS. A MADN group can be a TAFAS device which can be answered directly or picked up through the use of the TAFAS access code. A MADN group member can also answer a TAFAS call through the use of the access code.

6.5 Ring Again:

RING AGAIN can be assigned to KEYSET MADN MCA member's KEY SETS only. RING AGAIN cannot be assigned to and is incompatible with MADN MCA 500/2500 set users. This will be blocked by service orders (BCS14). In the future, if RING AGAIN is enhanced, this restriction may be dropped.

6.6 Subscriber Line Usage

Subscriber Line Usage can only be set on an individual member or line basis, through the use of office equipment numbers. Attempts to assign SLU to a MADN will be flagged as an error with an appropriate message being reported.

6.7 Call Waiting

Like Call Forwarding, Call Waiting will only be applicable to primary MCA members. Attempted assigning of CWT to non-primary members will be blocked by service orders and table control.

Call Waiting will behave as follows, depending on type of set.

P-SETS: If call waiting is available on the p-set and if the MADN is a member of the call waiting DN subset list, then a second incoming call to this active MADN member will be waited on this member's and only this member's call wait key.

500/2500 sets: If call waiting has been assigned to an active MADN member's line then a second incoming call will be waited on this member. If this member terminates the present call by going on-hook, only this set will be re-rung.

i.e. Incoming calls are waited on the Primary's line or set, not the whole group, and follow normal call waiting feature restrictions.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET ADD ON MODULE SOFTWARE
Feature no	F1833

FEATURE DESCRIPTION

Description

A P-phone main set may be expanded by the addition of addon modules. The addon module plug into the sides of the basic set. Each addon has 20 keys, but only the lower 16 will have LCD indicators. Each set can have a maximum of 3 addons. If the subscriber has an extension set, then the extension set can also have the maximum 3 addons. All lamp states on the addon indicating call status are consistent as they are on the main set. Updating addon lamp states apply to both the main and extension set. A description of the hardware configuration allowed on the P-phone can be found in DID c0528 on P-phone Data Structure.

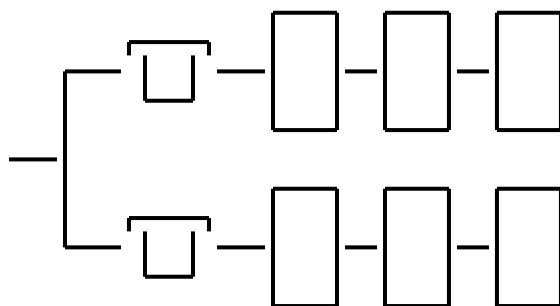


Fig. 1 Maximum P-phone Addon Configuration

Restrictions

For keys without LCD indicators, only the following features may currently be assigned:

- Call Pickup (CPU)
- Privacy Release (PRL)
- Executive Busy Override (EBO)
- Malicious Call Hold (MCH)

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET INDIVIDUAL BUSINESS LINE
Feature no	F1834

FEATURE SYNOPSIS

The Private Business Line (PBL) allows the P-phone subscriber the appearance of a POTS line as one of the Directory Number (DN) keys on the set. The PB line will have a POTS dialling plan.

FEATURE DESCRIPTION

Private Business Line Requirements

A customer group will be associated with the PB line. However, to the subscriber, it is in all respects separate from the customer group. All calls originating on the PBL key are Direct Outward Dial (DOD), including calls within the customer group are on a 7 digit number shown on the keys label.

All features assigned on the P-phone (both key and code access) are not available to the PB line with the exception of the HOLD and RLS key. More than one PBL key may be assigned on the P-phone. Station Message Detail Recording (SMDR) will apply to the PB line.

Private Business Line Restrictions

The PBL key cannot be assigned as the prime directory number (PDN) key due to the many restrictions that the PB line possesses. All lines on the P-phone are ibn_extended lines, this is also true for the PB line. The PB line is not a POTS line.

The P-phone Private Business Line is not the private line in the traditional sense applying to a PBX. Traditionally the private line meant that the subscriber has direct access to the C.O. The PBX has no knowledge of the line thus should the PBX fail the subscriber will still have some service. The P-phone PB line will not go directly to the class 5 C.O. rather, the calls will be routed to a dedicated trunk group initially. Dedicated in the sense that only PB lines will use that trunk group. If all the trunks are busy in this group, then normal routing will occur. Thus the PB line cannot remain in service should the switching system fail.

The PB line may be restricted by its Network-Class-of-Service (NCOS). NCOS is used by IBN translations to define a set of restrictions/capabilities which will deny/allow routing of the call.

Private Business Line Usage

The usage of the PBL key is the same as the DN key on the P-phone. No other key depressions are required to access an idle channel. The subscriber will not receive a second dial tone during usage.

Private Business Line Options

Most of the current existing IBN line options can be assigned to the PBX directory number. They are:

- Time and Charge Services on 1 + calls (ATC)
- Call Detail Recording (CDR)
- Denied Origination Service (DOR)
- Denied Termination Service (DTM)
- Essential Line Service (ELN)
- Free Number Termination (FNT)
- No Double Connection (NDC)
- No Receiver Off-Hook Tone (NOH)
- Operator Number Identification (ONI)
- Plug Up (PLP)
- Restricted Sent Paid (RSP)
- Suspend Service (SUS)
- Toll Essential Service (TES)

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET MALICIOUS CALL HOLD
Feature no	F1835

FEATURE DESCRIPTION

The malicious call hold (MCH) feature allows a P-Phone subscriber to hold a connection within the switching unit on a malicious call, enabling the call to be traced back to the originating party. Where both the calling and called parties are terminated in the switching unit, the entire connection is held until the called party releases the call. Where the call is on an incoming trunk and terminates within the switching unit, the connection will only be held back to the incoming trunk. Furthermore, activation of this feature causes a log report to be generated and an alarm sounded at the switching center.

Feature Operation:

The operation of the MCH feature on P-Phone sets depends on how the feature is assigned to the set, since MCH may either be assigned to a separate key on the set or it may be assigned as a code access feature. However, whether assigned to a separate key or not, MCH is a set feature which may be used on any of the set's directory number appearances.

The following paragraph describes the operation of the MCH feature on P-Phone sets having a separate MCH key. On incoming calls to any DN appearance on the P-Phone set, the called party can request malicious call hold once the call is in talking state by simply depressing the MCH key. As well as activating malicious call hold, this will cause the call to be automatically placed on hold from the P-Phone station and the active DN lamp will flash. This will also serve as visual feedback to the terminating party indicating that MCH has been successfully activated. It should be noted that while MCH may be assigned to a key having an associated lamp, activation of the feature will not cause the MCH lamp to be turned on. The originating party, on the other hand, will receive no notification, either visible or audible, that MCH has been activated on the call. Once in the held state, the call may still be reaccessed by depressing the DN key. However, once MCH has been activated, it can only be deactivated by the terminating party by releasing the call. Further depressions of the MCH key while the P-Phone station is active on the MCH held DN appearance will be ignored. Finally, once released by the terminating party, the MCH held call is taken down in the normal fashion.

The operation of malicious call hold on P-Phone sets to which the feature has been assigned as code access will be discussed next. In order to use the feature by code access, the set must also have either the 3-way calling (3WC) feature or the call transfer (CXR) feature assigned. Use of the call transfer key for MCH will further depend on the call transfer vari-

ation assigned. Since MCH, is a terminating feature, only call transfer incoming (CTINC) and call transfer all calls (CTALL) are appropriate. Once a call to a DN appearance is in talking state, the called party may request malicious call hold by first depressing either the 3WC key or the CXR key on the set. This will place the active DN key on hold, the DN key will flash and the lamp associated with the 3WC (or CXR) key will be turned on. Upon receiving a special dial tone, the subscriber then dials the telco defined access code for the MCH feature. This is the same code as is used for the calling line identification with flash (CLF) feature on standard lines. Once this is done, MCH is activated, the 3-port conference circuit obtained when the 3WC or CXR key was depressed is released and the original call is left on hold with the DN lamp flashing. Only the called party may now deactivate MCH and free the connection by releasing the call, either by going on-hook or by depressing the release (RLS) key on the set.

While the MCH feature is active on a P-Phone DN appearance, that call may still be put on hold and other DN appearances may be used to originate or answer calls. Furthermore, the MCH feature may still be activated on other incoming calls even when it is active on a call that has been placed on hold. Finally, the presence of a separate MCH key does not prevent the subscriber from accessing the feature by special code.

In situations where MCH has been activated on a P-Phone originator, the originator will still be able to place the call on hold and originate or answer calls on the other DN appearances on the set. However, if the P-Phone originator attempts to release the MCH held call by depressing the RLS key or going on-hook, these actions will simply be ignored and the lamp will remain in the on state, indicating that the DN is still involved in a call. Finally, other than what has just been mentioned, no special treatment will be given to the set.

Malicious Call Report:

There are 2 different log reports associated with the MCH feature, one being used when the calling party is on a line, the other being used when the call is from a trunk. These reports are identical to those used for the calling line identification with flash (CLF) feature on IBN lines since MCH is the P-Phone equivalent of CLF. Included in the log report for line originations (LINE 126) is the directory number and line equipment number (LEN) while the trunk report (LINE 125) includes the common language name and circuit number of the incoming trunk. The reports also specify the time and date of the call.

For P-Phone sets assigned the MCH feature, these log reports will only be generated when the feature is activated and not every time a call terminates on one of the set's DN appearances. If the subscriber wishes to have a report of every call termination on a particular P-Phone line, then the calling line identification (CLI) feature must also be assigned. Unlike MCH which is a set feature, CLI must be assigned to individual DN appearances on a P-Phone set.

Restrictions:

The only type of calls which may be held by the MCH feature are calls involving 2 parties only. If the originating or the terminating party is involved in any type of conference call which includes more than 2 parties, then it will not be possible to activate the MCH feature on the call. (Consultation calls to a third party using the 3-way calling feature are also considered conference calls and may therefore not be held by the MCH feature).

Other types of calls on which activation of the MCH feature will be disallowed include P-Phone intercom calls and calls in which an attendant console or an operator position is actively involved.

Finally, activation of the MCH feature on a call is only allowed once the call has reached talking state.

Feature Interactions:

The following section describes how the activation of Malicious Call Hold on a call affects the operation of other features which may be assigned to either parties. The activation of MCH will have no effect on features not mentioned in this section.

- Station features
- THREE-WAY CALLING/CALL TRANSFER

All attempts to initiate 3-way calling or call transfer from a call held by MCH will be denied, whether initiated by the calling or called party. This also means that all code access features will be denied on MCH held calls.

— CALL WAITING

For POTS and IBN stations, the call waiting feature is not compatible with MCH (or CLF). P-Phone stations may, however, be assigned both features. However, the call waiting feature will be deactivated on calls held by MCH such that the originating party will receive busy treatment.

— EXECUTIVE BUSY OVERRIDE

Attempts by incoming calls to activate the executive busy override (EBO) feature on calls held by MCH will be blocked and the calling party will receive reorder tone.

— CALL PARK

Parking calls held by the MCH feature using the call park key on a P-Phone set will be prevented.

- Attendant Console Feature

— ATTENDANT CAMP-ON

Attendant camp-on will not be possible on calls on which the MCH feature has been activated and the attendant will be given reorder treatment.

— BUSY VERIFICATION LINES

The attendant will not be able to busy verify a line involved in a call on which the MCH feature has been activated. In such cases, busy tone will be applied to the attendant console.

— BUSY VERIFICATION TRUNKS (BARGE-IN)

The attendant will not be able to barge-in on a trunk involved in a call on which the MCH feature has been activated. In such cases, busy tone will be applied to the console.

Package NTX106AA09 IBN - PROPRIETARY BUSINESS SET

Feature set	IBN
Feature	BUSINESS SET PRIVACY RELEASE (ACROSS SWITCH)
Feature no	F1837

FEATURE DESCRIPTION

1. General Description

Privacy Release (PRL) is an option that can be assigned to MADN SCA lines (multi-appearance directory number with single call arrangement DID V0954). This feature allows a MADN SCA line to establish a conference call among a number of MADN lines and an external party. A maximum of 30 parties are permitted in a single connection.

2. Feature Operation

This feature can only be activated by a MADN SCA line involved in a call that has progressed to the talking state.

2.1 Activate PRL from a 500/2500 set

A MADN 500/2500 set user can flash while in the talking state to obtain special dial tone. If the PRL access code is then dialed, a 2 second confirmation tone will be returned. After the confirmation tone is completed, the call reverts back to a regular two party call, and the PRL feature becomes activated.

Note: in SL-1 mixed MADN groups, PRL seems to be the default. i.e. going off hook from any MADN member results in a conference call

2.2 Activate PRL from a P-set

A P-set MADN user can activate PRL only if the PRL feature key is assigned to the set. To activate PRL, a P-set user simply depresses the PRL key while the MADN call is in the talking state. The PRL feature key does not require a lamp, i.e. can use key number 9 on a set.

2.3 Visual indication of an active PRL

When privacy release is active, the lamps associated with all the MADN group members are changed from steady ON state to winking state. 500/2500 set users do not get any kind of visual or audible indication.

2.4 Cancelling the PRL

A P-set user who initiates PRL can cancel the PRL feature by depressing the active MADN key before another MADN member enters the call. Holding a MADN call before PRL is answered would also deactivate the PRL feature. A 500/2500 set user can flash and dial a de-activation code to cancel the PRL feature once it is activated.

2.5 Entering a MADN PRL call

Once PRL is active, any MADN line can enter the call by going offhook or depressing the MADN key. Only one MADN line can be added to the call at a time. Once the PRL is answered, all the MADN key lamps are changed from winking state to steady on state. A P-set user can activate PRL again after the previous PRL is answered.

2.6 Leaving a PRL call

When a MADN party or the external party disconnects from an established PRL conference call, the disconnecting party is taken off the conference. However the rest of the conferees stay active in the conference call. When the second last party disconnects, the conference call is taken down.

After the external party leaves the conference, PRL will be disabled until the present PRL call has terminated.

3. Feature Restrictions

- PRL can be activated only if the MADN line is in talking state and no conferencing feature (except PRL initiated from the same group) is in progress.
- PRL is not allowed if the external party is an attendant console or operator.
- Once a MADN conference is established, no other conference feature is allowed.
- A maximum of 30 parties is permitted in a single MADN call.

4. Conference Circuit Requirements

6-port conference circuits will be used in all privacy release calls.

5. MADN HOLD

The MADN Hold feature described in V0914 is also supported under this feature because of the similarity in S/W implementation. For details, please refer to FDOC V0954.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET BUSY OVERRIDE
Feature no	F1848

FEATURE DESCRIPTION

Executive Busy Override (EBO) allows a P-phone station (P_set) to call a busy station by depressing the EBO key on the P-phone. It is a set feature, and therefore applies to all DNs on the P_set. EBO can be active on one or more DNs on a P_set at any instant. Each EBO key depression is always associated with the particular DN that is currently active.

There is no lamp associated with the EBO key.

Feature Use

EBO is activated by the originator of a call. To activate the feature, the station must have an EBO key, and the call must be connected to Busy Tone. The EBO terminator must be an IBN line in the same customer group as the originator and not assigned Executive Busy Override exempted (EBX). It must be in talking state, connected to a trunk or connected to a line that is not assigned the EBX option.

EBO activation sequence is as follows: B is talking to C. A dials B. A hears Busy Tone. A depresses the EBO key. If EBO is not valid, reorder is given to A. If EBO is valid, B and C hear EBO Warning Tone and A hears Silent Tone. The EBO Warning Tone is 440 Hz at -13dBm with 3 100 ms on Tones separated by 2 100ms off Tones (Reference: DID V0597). After 500 ms a 3-way-call is established with A as the controlling party. A then has the option of disconnecting C by depressing the EBO once again. In this case, C is disconnected and idled. At this point, the EBO feature is completed, and a standard 2 port call is established.

When the 3 way call configuration is up, one of these events can happen. If A hangs up, B and C go back to a 2 port standard configuration. If B hangs up, the 3 way call is taken down and each of A, B and C is idled. If C hangs up, A and B will be in a normal 2 port standard call configuration.

Code Access for EBO is supported under Feature C0818, Code Access for P-Phone.

Feature Assignment

P-phone EBO is assigned to a P-set by service order via table control. Contrary to IBN EBO, it is assigned through Table KSETFEAT rather than KSETLINE since it requires a feature key. However, once the feature is

assigned in KSETFEAT, it will be shown in table KSETLINE under the option category.

e.g. LM 02 0 0 1 8 EBO EBO

The EBX option is also part of this feature and can be assigned through service order via table KSETLINE. If an IBN line is assigned this option, EBO on this line is disallowed.

Feature Interaction

With the exception of Call Waiting, feature interactions for P-Phone EBO follow that of IBN EBO (see DID V0597). A P-Phone with EBO and CWT options will be call waited on while active with EBO, since P-Phone CWT does not require a 3 port conference circuit.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	SHORT HUNT ON BUSINESS SET
Feature no	F2720

FEATURE SYNOPSIS

This feature provides the capability for incoming calls to hunt over a set of directory number appearances (DNs) on a business set in search of an idle DN to terminate one. The DN's hunted over can be either standard directory numbers or multiple appearance directory numbers (MADNs).

FEATURE DESCRIPTION

The hunting for an idle appearance shall start with the dialled DN and hunt up the given keys from there. Hunting always takes place "up" the keys of the set where "up" means of increasing key value (e.g., the PDN is key 1, the RLS key is key 10 etc). This hunt is not circular and will stop once an idle DN is found or the hunt list following the dialled DN is exhausted. If the hunt list has been exhausted without an idle DN being found then an optional overflow DN or overflow route will be terminated on. Whenever the overflow treatment is applied, translation will be performed using the dial plan of the originally dialled party. If the overflow DN is busy or the terminator of the overflow route is busy, then busy treatment will be returned. This form of hunting will be completely independent of existing DMS hunt group types (e.g. DNH, MLH, etc).

The set of DN's and/or MADNs to be hunted over may include all of, or a subset of the DN appearances on a business set. The limiting factor of the number of members in the group is the maximum number of keys that can be specified in the key list field (24).

Reference

FDOC BR0720

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	BUSINESS SETS
Feature	AUTOMATIC LINE AND MADN
Feature no	F2805

FEATURE SYNOPSIS

This feature makes multiple appearance directory numbers (MADN) and automatic lines (AUL) compatible. In addition, automatic lines become compatible with many features/ options that do not require initial dial tone).

FEATURE DESCRIPTION

Currently MADN and AUL are incompatible. This feature makes it possible to assign automatic lines to as many members of a MADN group as desired. In addition, there is no restriction on where they must be routed to.

MADN-AUL lines can use MADN HOLD and PRIVACY RELEASE features and work with mixed set operations. MADN-AUL lines are compatible with most features that are compatible with MADN lines, except those that require initial dial tone, such as speed calling and last number redial.

The following is a list of options/features that become compatible with AUL:

AUTH/ACCT, CFX, CHD, CPK, CPU/DCPU, CWT/CWO/CWI/CWD, Station controlled conference calls, CXR, 3WC, EBO, MADN, MSB/MSBI, CLF, MCH, message waiting/call request, permanent hold, preset conference, RAG/ CBQ, DHQ, ERWT, thru dialing.

Ref:

BR0805 FDOC

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	SERVICES STATION FEATURES
Feature	BUSINESS SET - 36 BUTTON ADD ON SUPPORT
Feature no	F2864

FEATURE SYNOPSIS

This feature provides the necessary software to operate and maintain a M5036, 36 button add on unit, in conjunction with a M5000 series business set. The Meridian sets M5009, M5112, M5018 and M5317 will provide business sets with 9, 12, 18 and 17 keys respectively. This feature will replace the 20 button add on unit to complement the M5009, M5112, M5018 and M5317 sets.

FEATURE DESCRIPTION

The table entry and service order system are modified to allow datafilling 36 button add on. The 36 button add on unit will look electrically like a business set but with a high impedance line driver. The add on unit will operate in parallel with the M5009, M5119, M5018 or M5317 and will communicate with a 6X21 line card. Out of band signalling is used between the add on unit and does not effect the connection types which are allowed for business sets.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET CALL BACK QUEUING
Feature no	F3388

FEATURE DESCRIPTIONBusiness Set Call Back Queuing

The feature is an extension of the P-phone Ring Again; it allows a user to make a ring again request on a busy trunk in addition to a busy line.

Upon hearing busy tone, reorder tone or no circuits announcement the user may press the RAG key to make a call back queuing request. If the request is legal the RAG lamp will go on.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET EXTENSION SETS
Feature no	F3389

FEATURE SYNOPSIS

Northern Telecom's Business Set allows one extension set connected to the main set. To further enhance a users Business Set, a hands free speaker phone and a 20 key/16 LCD add-on module are optionally available.

FEATURE DESCRIPTION

The Business Set operates over a 2-wire (single pair) unloaded loop connected to a Business Set line card located in either a DMS-100/IBN host office or a DMS-100 remote. Each loop can support two Business Sets, one main and one extension, with each set having privacy. If one set is active on a call, the other cannot originate or terminate calls nor can it join the active call. The Business Set and each of its individual add-on modules has a distinct, hardcoded loop address. The hands-free unit is not affected by loop configuration or addressing rules. There are 4 address groups available.

Since both the main and the extension sets are always in Address Group 1, the features and/or directory numbers assigned to the programmable keys must be identical on both sets. Add-on modules in the same address group must also have identical feature sets; however, add-on modules may be assigned to different address groups if different feature and directory number assignments are desired. It is not necessary for both loop addresses within an address group to be occupied by add-on modules. For example:

The main set may have an add-on in loop address 1 while the extension can have add-ons in loop addresses 6 and/or 7. In this situation, the feature sets assigned to the main add-on and the extension add-on(s) can be completely different.

If both the main Business Set and the extension have the full complement of three add-ons, the feature sets assigned must be identical.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	MADN SERVICE ORDERS
Feature no	F3416

FEATURE DESCRIPTION

Currently service orders only supports MADN (Multi-Appearance Directory Number) on P-PHONE lines. This will be changed so that MADN is supported on P-PHONE lines, P-PHONE plus IBN lines, and IBN lines.

This means that MADN can be added as an option to P-PHONE and IBN lines both through the NEW command and the AKO (for P-PHONE) and ADO (for ibn) commands. The later two will add the MADN option to existing lines while the NEW command will create a new line to which MADN can be added.

The MADN option can not be removed from either type of line. In order to remove MADN the line must be completely removed from service using the OUT command.

With the NEW command the user will enter all the information as previously entering as the LCC either PSET (for P-PHONE) or IBN (for IBN) depending on the type of line to be created. When prompted by >OPTION: the user enter 'MDN'. Which will cause the next prompt to be >MDNTYPE: which must be one of 'SCA' or 'MCA' (for single call or multi call). The next prompt will be >PRIMARY: where the user enters either 'Y' or 'N' depending on whether the line being added is to be the primary one for the MADN group. There can only be one primary line per group. >ring: where the user enters either 'y' or 'n' depending on whether the phone is supposed to ring or not.

With the AKO and ADO commands the MADN option is added in the same way as described above.

NOTE: When adding MADN to a P-PHONE the 'ringing' prompt appears and must be filled in. Whether the MADN member will ring however is determined by whether the P-PHONE set has ringing and not by what is entered for the MADN information.

When a QDN or QLEN is done on a line that is a MADN the format of the information is the same as that of a normal line. The TYPE: comes out as 'MULTIPLE ACCESS DIRECTORY NUMBER' and there is a line for 'MADN INFO' which contains the 'TYPE', 'PRIMARY', and 'RING'. There is also a line called 'IBN TYPE' which will read 'MADN'. The last bit of information printed out is all of the members in the MADN group if there are any.

MADN lines are incompatible with UCD, CSDO, HUNT GROUPS, and DND. MADN will be made incompatible with the hunt group features SHU and RMB. Also

Call Forwarding can only be put onto a primary members line and CWT can only be put onto a mca primary member.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET GROUP INTERCOM
Feature no	F3452

FEATURE SYNOPSIS

Group intercom allows a customer to call a member of a predesignated group using abbreviated dialing. This feature is available in an IBN environment for both 500/2500 set and the business set.

FEATURE DESCRIPTION

An intercom group can have a maximum size of either 10 members, 100 members, 1000 members or 10,000 members. Those in a 10 member group dial 1 digit code (0-9), in a 100 member group the originator dials a 2 digit code etc. A set may be a member of several different GIC groups, however, each group must be represented by its own feature key. All members of an intercom group must be members of the same customer group.

There can be a maximum of 4096 GIC groups per DMS-100 switch. These can all be assigned to one very large customer group or can be spread across a number of customer groups.

To originate a group intercom call, the user depresses a GIC key and a 1 to 4 digit code. To receive a group intercom call the user depresses the GI key and lifts the handset.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET AUTOMATIC LINE
Feature no	F3453

FEATURE DESCRIPTION

P-phone Automatic Line (AUL) is a directory number feature which may be assigned to individual DN appearances on a P-phone station, including the primary DN. When an off-hook is reported from a DN appearance to which AUL has been assigned, a connection is automatically established to a pre-determined location. On P-phone stations, the off-hook is achieved either by depressing the DN key, or lifting the receiver from its cradle, in which case the primary DN is automatically selected. The terminating location, which may be served by the same office but can also involve out-pulsing, is specified by digits entered via service orders when the AUL feature is assigned. This stored number can be from 1 to 15 digits in length and may not include either asterisks (*) or octothorpes (#).

Restrictions:

There will be no restrictions on other features which may be assigned to P-phone stations having one or more automatic lines. However, features such as speed calling and automatic dial will not be usable from automatic lines for obvious reasons.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	BUSINESS SET ADDONS & EXTN FACILITIES MAINTENANCE
Feature no	F3735

FEATURE SYNOPSIS

This feature provides the Facility Maintenance for P-phone add-on units and extension sets. This is an add-on and extension test, run as part of the p-phone line card diagnostic and a station ring test.

FEATURE DESCRIPTION

The add-on and extension test will only be run on p-phone sets for which at least one add-on or extension set is data filled. The add-on and extension test will consist of looping a message at each end of the 8 possible p-phone set addresses. The data fill for each set address (present/not present) is compared with the loop back result (responding/not responding). If any of the set addresses are present/not_responding or not_present/responding the line card diagnostic will fail and a log will be output. If all set addresses are present/responding or not present/not responding, the add-on and extension test will pass.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	CENTREX
Feature	P_PHONE LINECARD
Feature no	F4411

FEATURE SYNOPSIS

This feature updates the p-phone line card diagnostic to recognize the new NT6X21BC card (A-law).

FEATURE DESCRIPTION

P-Phone Line Cards

The Enhanced Business Set (EBS) line card (NT6X21) provides voice and signalling interfaces between 2-wire analog subscriber lines using business sets and the 4-wire, 32-channel, 2.56 Mb/s digital bit stream of the DMS-100.

Each EBS line card supports one business set and up to three addressable add-on units. The line card occupies one of the 64 plug in card positions in a Line Concentrating Module (LCM) drawer (see ref 6).

This card can also occupy one of the 64 plug in card positions in an International Line Concentrating Module (ILCM) and a Very Small Remote (VSR).

A-Law Enhanced Business Set Line Card:

The existing p-phone line card is a Mu-law line card. Mu-law is a fifteen segment encoding and decoding scheme. However, CCITT recommendations for analog to digital PCM sampling are 'eight binary digits per sample to be used for international circuits'. This scheme for international circuits is called A-law and is in effect a thirteen segment encoding and decoding scheme.

6X21BC A-law Enhanced Business Set Line Card Diagnostic:

The a-law p-phone line card diagnostic will consist of the following list of tests:

- missing card
- loop signalling at line card
- p-phone transhybrid loss test
- test pads in line card
- noise test
- LCM buffer full flag high
- card equalization low
- card equalization high
- battery feed resistors

- cutoff relay test - open
- cutoff relay test - closed
- flux cancellation circuitry
- loop signalling at key set
- terminal equalization
- LCM buffer full flag low
- subscriber loop test.

The list of tests for the a-law p-phone are the standard list of tests for a p-phone line card (for further details see ref 2. No new tests are added).

Ref:

1. CCITT RED BOOK FASCICLE IV.4 Rec. 0.22
2. NTP 297-2101-516 DMS-100 Family Line Maintenance Reference Manual
3. NTP 297-1001-451 Common Customer Data Schema
4. NTP 297-1001-510 DMS-100 Family Log Reports Manual
5. GS6X21 Business Set (p-phone) Line Card, General Spec
6. GS6X05 LCM Drawer, General Spec
7. MCL Centrex P-Phone Transmission Rules (Iss 1), June 12/87
8. FDOC AE0226 P-Phone Line Card Diagnostics (A-Law)

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	IBN
Feature	ENHANCED SERVORD FOR BUSINESS SET
Feature no	F5718

FEATURE SYNOPSIS

This feature enhances the capability of the service order for the business set. These include adding or deleting from a multiple access directory number (MADN) group, creating a display business set, swapping DNS and queuing call pickup and speed call user groups.

FEATURE DESCRIPTION

This feature provides more capabilities to the telcos and their customers to change various information. These capabilities include:

- List all the members in a call pick up (CPU) group.
- List the controller and all the members of a specified speed call users (SCU) group.
- Change a MADN line into a normal line without taking the line out of service.
- Use the SWAP command on sets with MADN, huntgroup, speed call (long and short), call forward and call pick up feature.
- Change the customer group assigned to a line via SERVORD.
- Change the "ring" option of a business set via SERVORD.
- Change the customer group assigned to virtual facility groups.
- Change the customer group assigned to trunks.
- Change a DISPLAY business set to a non display business set via SERVORD.

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	PRODUCT
Feature	M518 SUPPORT AND INTRODUCTION
Feature no	F6630

FEATURE SYNOPSIS

This feature adds software to Table Control, Service Order/Query, Loop Maintenance, and Call Processing to support the M518 add-on for the Meridian sets M5009, M5209, M5112, and M5312.

FEATURE DESCRIPTION

The M518 add-on has 18 assignable keys. Each key is individually equipped with a lamp.

Each of the above listed Meridian sets can have up to three M518 add-ons or a combination of one M518 plus one 36-button add-on (M536).

A new option, M518, is added to Table KSETINV table control to allow the craftsman to specify that a set is equipped with M518 add-ons.

A new line option, M518, is introduced to allow the craftsman use Service Order (SERVORD) to specify that a set is equipped with M518 add-ons.

Ref: FDOC AG0978

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	STATION FEATURE
Feature	CALL WAITING ORIGINATION FOR EBS
Feature no	F7200

Synopsis

The Business Set Call Waiting Originate feature allows an Electronic Business Set (EBS) user to automatically impose call waiting on an intragroup call, on either a 500/2500 set, or an EBS with a call waiting key assigned.

Implementation

This feature is implemented by assigning the CWO option to the EBS in Table KSETLINE.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks (IBN) - Basic
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

CWO cannot be assigned to an Attendant Console.

CWO can only be imposed on a line that is busy. No more than one call can be call waited at a time.

CWO works with the following other line options:

Executive Busy Override (EBO)
Night Service

Users of the following line options cannot implement CWO:

Denied Originating (DOR)
Call Forward Universal (CFU)
Call Forward Intragroup (CFI)

Call Forward Busy (CFB)
Call Forward Busy Intragroup (CBI)
Calling Line Identification with Flash (CLF)
No Double Connect (NDC)
Call Park
Call Waiting Intragroup (CWI)
Call waiting Exempt (CWX)
Do Not Disturb (DND)

CWO users cannot use the following line options:

Call Pick-up
Three-way Calling
Permanent Hold
Attendant Busy Verify

Call Waiting cannot be imposed using CWO on a station that is:

- * talking to an Emergency Service Bureau
- * in a Hunt Group
- * an IBN Attendant Console
- * involved in a call with an Autovon trunk

Restrictions

There are no restrictions on the use of this feature.

Reference

FDOC AD1515

Package	NTX106AA09 IBN - PROPRIETARY BUSINESS SET
Feature set	STATION FEATURE
Feature	DIAL CALL WAITING FOR EBS
Feature no	F7201

Synopsis

The Business Set Dial Call Waiting (CWD) feature allows an Electronic Business Set (EBS) user to impose call waiting on a busy station. It also allows an EBS user to prevent CWD and Call Waiting Originating from imposing call waiting.

Implementation

The CWD feature is assigned to an EBS in Table KSETLINE. The access code for the CWD feature is datafilled in Table IBNXLA. If a customer group chooses to receive a recorded announcement or music while the calling party is waiting, the operating company datafills the CWD Treatment option in table CUSTSTN.

The CWX feature is assigned to an EBS in Table KSETLINE.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks (IBN) - Basic
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation/Deactivation

An EBS user imposes call waiting on a busy called station by entering the CWD feature access code, followed by the directory number of the busy station.

Interactions

CWD cannot be assigned to an Attendant Console.

CWD can only be imposed on a line that is busy. A maximum of one call can be call waited at a time.

CWD works with the following other line options:

* Executive Busy Override (EBO)

* Night Service

CWD does not work with the following other line options:

- * Denied Originating (DOR)
- * Call Forward Universal (CFU)
- * Call Forward Intragroup (CFI)
- * Call Forward Busy (CFB)
- * Call Forward Busy Intragroup (CBI)
- * Calling Line Identification with Flash (CLF)
- * No Double Connect (NDC)
- * Call Park
- * Call Waiting Intragroup (CWI)
- * Call Waiting Exempt (CWX)
- * Do Not Disturb (DND)

The following line options do not work with CWD:

- * Call Pick-up
- * Three-way Calling
- * Permanent Hold
- * Attendant Busy Verify

Call Waiting cannot be imposed using CWD on a station that is:

- * talking to an Emergency Service Bureau
- * in a Hunt Group
- * an IBN Attendant Console
- * involved in a call with an Autovon trunk

Restrictions

The calling party can only receive ringing if the call terminates on an EBS, even if recorded announcement or music is datafilled in Table CUSTSTN.

Reference

FDOC AD1516

NTX108AA05 Status: RTM IBN - DISPLAY FEATURES

IBN	:	
BUSINESS SET DISPLAY CALLED NUMBER		F1838
ACD CALL PROCESSING	:	
CALL SOURCE ID		F1839
IBN	:	
BUSINESS SET QUERY TIME KEY		F1841
CALL FORWARD DESTINATION DISPLAY		F2851
DISPLAY	:	
BUSINESS SET FEATURE DISPLAY		F3410
DISPLAY FEATURES	:	
CALL FORWARD REASON DISPLAY		F6334
DISPLAY	:	
M5209/M5312 DISPLAY SETS		F6586
ENHANCED REASON DISPLAY		F7152

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	IBN
Feature	BUSINESS SET DISPLAY CALLED NUMBER
Feature no	F1838

FEATURE SYNOPSIS

The P-phone with display is a standard p-phone with a 32 character alphanumeric liquid crystal display. The display will aid the user by providing enhanced visual feedback during the originating, terminating, programming and feature activating operations of the Display-Set. This feature deals with the display of the called number information.

FEATURE DESCRIPTION

During the dialing phase of a call, all the digits entered are echoed locally (by the p-phone micro) on the lower display line. Digits are echoed from left to right. If more than 16 digits are entered, the upper display is first cleared and then the most significant digits are shifted up to the upper display line.

The call may successfully terminate on a line, trunk, attendant etc. or may be routed to some form of treatment. The upper display line will not be updated to reflect the terminating status and is left blank. The upper display will be used to indicate a new termination if the call is forwarded or picked up.

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	ACD CALL PROCESSING
Feature	CALL SOURCE ID
Feature no	F1839

FEATURE SYNOPSIS

The P-phone with display is a standard p-phone with a 32 character alphanumeric liquid crystal display (LCD). This display will aid the user by providing enhanced visual feedback during the originating, terminating, programming and feature activating operations of the p-phone. This feature deals with the display of incoming call information.

FEATURE DESCRIPTION

When an incoming call arrives at the primary directory number (PDN) of a DISPLAY-SET, and the DISPLAY-SET is idle, (no active DNs and not in a programming or digit collection state), the incoming call's information will be auto-displayed on the upper line of the 2 line display. If the DISPLAY-SET is not idle but the PDN is, the incoming call information will not be displayed. As soon as the set goes idle the PDN's call will be displayed.

Calls arriving at a Secondary directory number (SDN) will only have the corresponding information displayed when the call is answered or through the use of the DISPLAY KEY (ie no auto-display).

The information displayed will vary depending on the type of originator of the incoming call.

- 1) For calls from within the same customer group the digits displayed will be the caller's extension.

For calls from outside this customer group but from within the same switch the default message for information unavailable will be displayed (ie "33333333 "). This is assuming that the inter-customer group display office parm is not set. If this office parm is set then the seven digits of the calling party's DN are displayed unless extension form inter group dialing is used. If this is the case then again just the caller's extension is shown. Incoming POTS calls are never displayed.

For calls that have been forwarded from within the same customer group without going through trunks, the originator's DN will be displayed and not the last leg's.

- 2) For calls arriving from trunks of the same customer group, the abbreviated Common Language Name (short CLLI) (6 characters) of the trunk group will be displayed. Again if the inter_group

office parm is set then outside IBN trunk CLLIs will also be displayed. It is the responsibility of the customer (telco) to associate meaningful short CLLIs with trunk groups (table CLLIMTCE).

- 3) For calls arriving from attendant consoles from within the same customer group or if the office parm is set, the last 8 characters of the CLLI for that attendant will be displayed. Again it is the customer's responsibility to make the CLLIs unique and meaningful. For calls extended by the attendant to the DISPLAY SET, the source or other party and not the attendant will be displayed.

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	IBN
Feature	BUSINESS SET QUERY TIME KEY
Feature no	F1841

FEATURE SYNOPSIS

This feature will provide the current time and date on a p-phone LCD display when the Query Time and Date key is depressed. The time display will be using the 24 hour clock format and the date will be displayed in the year, month and day sequence: YY/MM/DD HH:MM

FEATURE DESCRIPTION

The Query Time and Date feature can only be assigned to P_Phones equipped with a display and need not be assigned to a key/lamp pair because the lamp is not needed for this feature. A key depression of the Query Time and Date feature will cause the time and date to be displayed for a 15 second interval or until another feature or action using the display is activated or occurs. After the 15 second interval has expired the display will be returned to its original state only if the DN key was active previous to the Query Time key hit, otherwise the display will be cleared.

The displayed time will not be updated during the 15 second interval. Multiple key hits, though, will cause multiple QueryTime requests which will update the display with any time changes.

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	IBN
Feature	CALL FORWARD DESTINATION DISPLAY
Feature no	F2851

FEATURE SYNOPSIS

The Call Forward/Automatic Dial Display feature will display the previously stored number when programming call forwarding or automatic dialling on an electronic business set with a display (EBS). If the set is being programmed for the first time the set will display '____'. Once the feature has been activated/programmed the display will be cleared.

FEATURE DESCRIPTION

With the call forward/automatic dial display feature the users will be able to identify what number their phone was programmed with if they have an EBS. When the users depress the key to program the feature, if a number was previously stored it will be displayed on the top line of the display, otherwise '____' will be displayed. If the users wish to program their phone with the same number they depress the key a second time to activate/program the feature. If the users wish to enter a new number before depressing the key a second time to activate/program the feature.

When call forwarding is activated and the users want to know where they have their EBS forwarded to, they depress the key to deactivate call forwarding, depress the key to program call forwarding which will then display the number, and depress the key to activate call forwarding again. It takes three key hits to ascertain where the phone is forwarded to. Note: after call forwarding has been reactivated the display will be cleared.

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	DISPLAY
Feature	BUSINESS SET FEATURE DISPLAY
Feature no	F3410

FEATURE SYNOPSIS

The display set is a standard p-phone with a 32 character alphanumeric liquid crystal display. The display will aid the user by providing enhanced visual feedback during the originating, terminating, programming and feature activating operations of the p-phone.

This feature deals with the display's operation during the use of features.

FEATURE DESCRIPTION

Certain design criteria have been followed during the development of the DISPLAY-SET software. These include:

- 1) SL-1 compatibility, though not complete compatibility due to hardware differences;
- 2) Provide the user with consistent and accurate information at all times;
- 3) Keep the impact on existing call processing software (e.g., real time usage) to a minimum
- 4) Avoid language dependant displays.

In keeping with these criteria the following design decisions have been followed:

- 1) The bottom line of the display is for dialed digit echoing. If more than 16 digits are used the digits will be scrolled to the top line;
- 2) The top line of the display is for display of other than user entered data, such as incoming call information or the results of queries;
- 3) If a different party than dialed answers an incoming call, (e.g. Call Pickup) then the answering party's information will be displayed on the originator's display's top line;
- 4) If a different party than dialed answers an incoming call then the originator's information followed by the last terminated

on party of this call will be displayed. The two strings of information will appear separated by a blank on the answering party's top line

- 5) When in a voluntary conference (e.g. 3WC or CONF30), then the symbol "+++++++" will appear on all conferees' displays.

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	DISPLAY FEATURES
Feature	CALL FORWARD REASON DISPLAY
Feature no	F6334

FEATURE SYNOPSIS

When an electronic business set (EBS) equipped with a display receives a forwarded call, the reason the call was forwarded from the first base station will be displayed on the second line of the display. The reason will be displayed in the language determined by the customer group of the base station.

FEATURE DESCRIPTION

When the destination of a forwarded call is an EBS set equipped with a display, the type of call forwarding used by the base station will be displayed on its lower level. This is in addition to the DN of the caller and the DN of the base station which are already displayed on the upper level.

Regardless of any call forward chaining, only the first base stations type of call forwarding will be displayed. One of three types of messages will be displayed. They are:

- 1) All calls are forwarded message, CFU
- 2) A busy on a call message (CFB)
- 3) A did not answer message (CFD).

This is an optional feature. It must be added through table control via table CUSTSTN.

Ref: V0451, V0452, V0453 - Call Forward
AK0915, BV1728, BC1258, BC1206, BV0820, BZ0219
NTP DS137 - Customer Group Tables

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	DISPLAY
Feature	M5209/M5312 DISPLAY SETS
Feature no	F6586

FEATURE SYNOPSIS

This feature provides table control, service orders, maintenance and call processing support for the Meridian sets M5209 and M5312.

FEATURE DESCRIPTION

1. Table Control

The table KSETINV is modified in terms of add ons and extensions on the loop, plus ringing profile. Two new set types KSET_M5209 and KSET_M5312 and added to allow the craftspersons the new sets. This table control enables datafilling the M5209 + M5312 for the tables KSETINV, KSETFEAT and KSETLINE.

2. Service Orders

Two new LCC values 'M5209' and 'M5312' are introduced, the other change to 501 query commands are incorporated.

3. Maintenance Support

Same exec lineup as for the terminal type KSET. The terminal types downloaded to the LGC for M5209 and M5312 are close to the same as for M5009 and M5112 respectively. Therefore, there is no change to the maintenance operating procedure.

4. Call Processing Support

- The same call processing core software as currently used to handle all EBS types is used to handle the M5209 and M5312.
- Modification will be done to accommodate the distinct physical characteristics of the M5209 and M5312.
- In particular, modification will be done to accommodate the M5209/M5312 new screen size 2x24 (vs 2x16 for the old display).
- Also modification will be done to handle the new lamp number 9 for the M5209.
- Station ringer tests are the same as M5009 and M5112 sets.

Ref: AC0309

Package	NTX108AA05 IBN - DISPLAY FEATURES
Feature set	DISPLAY
Feature	ENHANCED REASON DISPLAY
Feature no	F7152

FEATURE SYNOPSIS

This feature provides enhanced feature reason and call progress information for EBS sets with display capability. Reason display will provide enhanced calling and called information to the respective parties involved in a call. The information provided for display as classified is as follows:

- DN of a calling or called party
- REASON if the call resulted in a different call situation by a feature activation. This may include redirecting DN.

The DN of the calling party is provided to the called party, and the DN of the called party (dialed digits) are echoed on the calling party's display. REASON display will add the REASON of call redirection to both calling and called parties.

FEATURE DESCRIPTION

Reason display is provided for IBN call display (excluding attendant consoles) for intragroup calls or intergroup calls with customer group transparency. The IBN features to be provided with reason display are:

- call forwarding
- call pick up
- call park/directed call park
- conference (station, meet me, preset, attendant)
- three way call.

The reason display is a datafillable message to inform the user of the reason for the call redirection or to provide information about the progress of the call.

The types of EBS display sets supported for this feature are NT4X20 with a 2X16 character display, M5209 and M5312 both with a 2X24 character display.

NTX110AA01 Status: RTM IBN - HOSPITAL

STATION FEATURES	:	
DO NOT DISTURB		F1153
CODE RED/CODE BLUE		F1630

Package	NTX110AA01 IBN - HOSPITAL
Feature set	STATION FEATURES
Feature	DO NOT DISTURB
Feature no	F1153

FEATURE SYNOPSIS

This feature provides the attendant control of these station capabilities: selected single station diversion, selected group station diversion, all station diversion and attendant completion of calls to diverted stations.

FEATURE DESCRIPTION

NTX111AA03 Status: RTM IBN - LARGE CONFERENCE

CONFERENCE FEATURES	:	
ATTENDANT CONFERENCE (LARGE)		F1631
MEET - ME CONFERENCE (LARGE)		F1632
STATION CONTROLLED CONFERENCE (LARGE)		F1633

Package	NTX111AA03 IBN - LARGE CONFERENCE
Feature set	CONFERENCE FEATURES
Feature	MEET - ME CONFERENCE (LARGE)
Feature no	F1632

DESCRIPTION -

Introduction
=====

This feature will extend the maximum number of conferees in a Meet Me Conference from 6 to 10 or more.

To allow for this extension, more than one conference bridge would be required for a Meet Me Conference.

The first bridge allocated to a conference will be referred to as the primary bridge. When another bridge is required (i.e. more than 6 conferees have been connected to the conference), a conferee will be transferred from the primary bridge to a new bridge which is connected to the primary bridge via the port used by the transferred conferee. This bridge, connecting to the primary bridge, will be referred to as a secondary bridge.

In view of hardware limitation, once a bridge is connected to a primary bridge, it is not allowed to connect to another bridge. By this restriction, the maximum number of bridges allocated for a Meet Me Conference call will be 7 (forming a star configuration with one primary bridge and six secondary bridges), and the maximum number of conferees will be 30.

Method of operation of this feature will be the same as the existing Meet Me conference. Refer to v0477 'Meet Me Conference' for detailed feature description.

Feature Description
=====

This section will describe changes unique to the new feature.

When a station dials a Meet Me conference directory number, DMS will take one of the following actions:

- 1) If the maximum number of conferees has been

reached, the station will receive busy treatment.

- 2) If there is a port available on the primary bridge, the station will be connected to the port.
- 3) If there is no free port left on the primary bridge, a check will be made to see if there is any bridge (secondary bridge) interconnected with the primary bridge. If so, a search will be made to locate a free port on the secondary bridges. The first available port will be used to connect the station to the conference.
- 4) If there is no port available from the conference configuration, a check will be made to see if there is at least one port on the primary bridge not connecting to a secondary bridge. If so, a request for a 6 port conference bridge will be made. If allocated, the system will remove one of the conferees from the primary bridge, interconnect the port with a port on the new bridge, and add the removed conferee and the new conferee onto the new bridge.

In all cases, a 1 second audible ring tone (440 hz + 480 hz) is given to the conference when a new conferee is connected to the conference.

The system will keep track of the number of conferees in the conference. When a conferee disconnects from a secondary bridge, a check will be made to see if he was the last conferee on that bridge. If so, the secondary bridge will be disconnected from the primary bridge and returned to the idle pool. When the number of conferees decreases to 1, the conference call will be taken down and all resources will be returned to the idle pool.

Feature Restrictions =====

The same restrictions for the existing Meet Me Conference will be applied to this feature.

Package	NTX111AA03 IBN - LARGE CONFERENCE
Feature set	CONFERENCE FEATURES
Feature	STATION CONTROLLED CONFERENCE (LARGE)
Feature no	F1633

FEATURE DESCRIPTION

This feature permits a 500/2500 IBN station to establish a conference call consisting of more than three parties without the assistance of the attendant.

The maximum number of conferees, including the 500/2500 station, is 30. The station can be assigned 1 of 7 feature variants. These are:

1. Conference 6
2. Conference 10
3. Conference 14
4. Conference 18
5. Conference 22
6. Conference 26
7. Conference 30

The conferees can include lines in the same customer group, lines belonging to another customer group, stations reached via trunks.

FEATURE INCLUSION

In this DID, the station which sets up the conference call is referred to as the controller, or simply as "A".

A must be an IBN line served by DMS-100 (LM or RLM)

The feature defined here is applicable to 500/2500 sets only. A separate DID will be issued for P-phone conference. Attendant console conference capabilities are detailed in DID V0437 and V0912.

It is design intent to have this feature work in a reasonable manner for 500/2500 sets. Therefore, feature interaction will be kept to a minimum for the controller. It is not design intent to have a number of features active at the same time.

FEATURE CODE ASSIGNMENTS

Two feature codes are required for this feature:

1. A Conference code. This code is used to:

a. specify that the Conference feature is to be invoked. By dialing this code, the user specifies that a Conference consisting of more than 3 parties is to be set up.

b. add a conferee into the conference

In this DID it will be called the CONF code.

2. A Release code. This code is used to drop a party instead of adding the party into the conference call.

In this DID it will be called the RLS code.

The CONF code is used in a manner similar to the CONF key on the Attendant console and P-phone.

The RLS code has the same use as depressing the RLS DEST key on the attendant console and the RLS key on P-phone.

Both the CONF code and the RLS code are defined at the Customer Group level. The preferred format is ³YX.

CONFERENCE TONES

CONF tone is used to alert any existing conferees that A, and possibly a new conferee, are joining the conference call.

Tone is also applied any time any conferee goes on-hook.

Each time A (and possibly a new conferee) joins the conference, 400 msec of audible ringback tone will be heard by all existing conferees.

Each time a conferee abandons, all remaining conferees will hear 400 msec of dial tone.

FEATURE USE

A is an IBN line assigned the Conference feature. A can elect to establish a Conference call by:

1. going off-hook and dialing the CONF code. In this case A never invokes the existing 3 way calling feature and some feature interactions are avoided.
2. being in a 2 port call first. A flashes and dials the CONF code. In this case flash by A temporarily invokes the 3 way calling feature until the CONF code is dialed.

Both methods are described below.

Scenario 1

A goes off-hook, hears dial tone and dials the CONF code. This tells DMS-100 that A plans to establish a conference call consisting of more than 3 parties. A will hear:

- special dial tone if a 6 port conference bridge is available. The bridge is reserved.
- reorder tone if a 6 port bridge is not available. In this case A can only go on-hook.

Once A hears special dial tone, A will dial the first potential conferee, party B. A waits for B to answer. At this point A flashes. A hears special dial tone and can:

- i. dial the CONF code. This places A and B on 2 of the ports of the conference bridge. A and B can talk. A can now flash again. This removes A from the bridge. A will hear special dial tone.
- ii. dial the RLS code. This drops the connection to B and A will hear special dial tone. The bridge is still reserved for A. A can elect to dial another B or abandon by going on-hook. If A goes on-hook, the conference bridge is idled.

Once A hears special dial tone in (i) above, A dials C. A can flash. A will hear special dial tone. A can now either dial the CONF or RLS code.

If A dials the CONF code, A and C are placed on the conference bridge with B and can talk. When A and the new conferee are added, B will hear a short burst of CONF tone. This will tell B that A is rejoining the bridge, with or without a new conferee.

If A dials the RLS code, A will hear special dial tone. A can dial a new C or A can dial the CONF code. If A dials the CONF code, a burst of CONF tone will be given to B after which A and B are connected on the bridge and A can explain to B what has happened.

Once A, B and C are connected on the bridge, A can flash. A will hear special dial tone. A can dial party D. Once D answers, A can flash, receive special dial tone and dial either the CONF or RLS code. Assuming A dials the CONF code, B and C will hear a burst of CONF tone following which A, B, C and D are all connected to the bridge and can talk.

To add a fifth and sixth party, A repeats the above sequences.

Scenario 2

A and B are involved in a 2 port call. A flashes.

If a 6 port conference bridge is available, A and B are connected to two of the ports of the conference bridge. If a conference bridge is not available, A will hear reorder tone for 5 seconds, after which A and B are reconnected. If A flashes during reorder tone, reorder tone will stop and A and B will be reconnected.

Once A and B are connected to the bridge, A can dial C by flashing as described in scenario 1. From this point on, the feature operates in the same manner.

NTX112AB03 Status: RTM IBN - VIRTUAL FACILITY GROUPS

IBN	:	
CLASS 5 IBN OUTWATS		F1234
OHQ, CBQ FOR OUTWATS VFG		F1790
CLASS 5 IBN INWATS		F2359
TRK GRP BUSY OF VIRTUAL FACILITY GRPS ON ATTENDANT CONSOLE		F3789
ATTENDANT CONTROL OF VFG		F3791
VFG USAGE DATA		F3841
ADMINISTRATION	:	
VFG INWATS OVFL TOTALS TO AMA TAPE - IBN		G0003

Package	NTX112AB03 IBN - VIRTUAL FACILITY GROUPS
Feature set	IBN
Feature	CLASS 5 IBN OUTWATS
Feature no	F1234

FEATURE SYNOPSIS

With this feature, any line in an IBN customer group can dial an access code for OUTWATS, subject to class of service restrictions. The feature provides a virtual trunk group:

1. eliminating the need for physical loop around trunks
2. providing control of outward access by group size and zone restrictions, and
3. providing Outwats billing at a single point for the customer group.

FEATURE DESCRIPTION

Package NTX112AB03 IBN - VIRTUAL FACILITY GROUPS
Feature set IBN
Feature OHQ, CBQ FOR OUTWATS VFG
Feature no F1790

BACKGROUND:**general information**

Virtual Facility Groups (VFG's) were introduced in BCS10 to provide a mechanism with which to eliminate the looparound trunks traditionally used to implement INWATS and OUTWATS. They came as part of the INWATS/OUTWATS package and were non-optional. In BCS11, we will expand on the use of VFG's by making them optional and by allowing calls to be queued for them.

references

See the DIDs for features V0686 (IBN class 5 OUTWATS) and V0687 (IBN class 5 INWATS) for examples of datafill and current usage.

DESCRIPTION OF EXISTING VFG SYSTEM**background**

With the advent of IBN class 5 offices, many of the features that have traditionally been implemented in a PBX by routing to a trunk to the TELCO have to use loop-around trunks. This practice is undesirable for several reasons:

- 1) it is necessary to commission physical trunks which the customer has to pay for.
- 2) the call ends up with several discrete call processes, with these communicating among themselves via the loop-around. This causes increased CC load as well as increased message traffic and increased PM load.
- 3) since the call processes are communicating via a trunk, the amount of information available is very limited. This makes it more difficult to implement features such as ESN.

Clearly, this approach is undesirable. The way around this problem is to provide virtual 'loop-arounds' in software.

To simulate finite resources (lines/trunks) in software, we will provide a general facility called Virtual Facility Groups.

requirements:

We need a system whereby we can apply limits to the number of calls that can use a route.

- 1) It must be completely independent of the actual (physical) route to be used, so it must not be directional (i.e. it must not point to a route).
- 2) It must look like a line or a trunk for originating calls.
 - POTS line for OUTWATS
 - IBN trunk for INWATS
 - possible future uses as IBN lines or POTS trunk
- 3) It must provide the usual usage information for trunks:
 - total attempts
 - successful attempts
 - failed attempts
- 4) It must provide a mechanism for updating the screening info.
- 5) It must be possible to off-hook/call-back queue for VFGs just as you would for the trunks they simulate.

DESIGN APPROACH:**Table Control:**

The virtual facility groups will be defined in table VIRTGRPS. The key will be an eight char user-defined name and the data will be as follows:

```
VFGtype      { SIZE, USES } refinements:
{ SIZE }
  size       { 0 to 2047 }
{ USES }
  group      virtual_facility_group
inctype      { NIL, POTS, IBN } refinements:
{ NIL }
{ POTS }
  billDN     ten_digit_code
  lineattr   line_attributes_index
  lineCDR    { Y,N }
{ IBN }
  billDN     ten_digit_code
  custCLLI   common_language_name
  subgrp     { 0 to 7 }
  TRC        { 0 to 7 }
  NCOS       network_class_of_service
  intragr    { Y,N }
  SMDR       { Y,N }
  CDR        { Y,N }
```

VFGtype specifies whether virtual circuits are to be actually allocated (via SIZE) or this group will share the circuits of another group.

'SIZE xxx' gives the number of simultaneous accesses allowed for this group.

'USES groupname' indicates the name of another group which must be a 'SIZE xxx' and which contains the previously allocated virtual facilities. This provides the means to have virtual 2-way trunks, and/or to associate more than one set of screening data with the same set of virtual circuits. (The set of data you wish to use is provided by the name of the group.)

The INCTYPE (incoming type) is used to match the new screening information with the environment that the call is being 'trunked' to.

To allow future use of VFG's for purposes other than virtual trunks/lines/looparounds (i.e. for throttling), the NIL screening class is provided. There is no screening information associated with this type of VFG.

For a call entering the POTS environment, the following are required to establish the translation, screening and billing environment:

Billdn -is the (optional) billing # to which the next leg of the call is to be charged.

line_attributes_index specifies the translators and screeners to be used for the next leg of the call.

lineCDR -switches Call Detail Recording ON/OFF for virtual LINE type calls (i.e. A virtual OUTWATs line.)

For a call entering the IBN environment, more info is needed:

Billdn -is the (optional) billing # to which the next leg of the call is to be charged.

CUSTCLLI -specifies the customer group being entered.

SUBGRP -specifies the customer subgroup being entered.

TRC -is the terminating restriction code used to determine whether a trunk can terminate on a specific line, etc.

NCOS -is the new Network class of service with which to screen and translate the next leg of the call.

SMDR -tells whether SMDR records are to be produced if the translation data requests them (N shuts off SMDR for this leg of the call).

CDR -tells whether a SMDR record should be produced unconditionally for this leg of the call.

INTRAGRP -is provided for trunk-data compatibility.

Data Changes:

Deleting or changing a VFG while a call, which is in talking state, is using it has no effect on that call or on any other call. A call will not accidentally deallocate another call's VFG.

Pegs:

The following pegs will be provided for each VFG:
total attempts
blocked attempts

These two pegs can be used to calculate successful attempts, and are defined in the OM group VFGUSAGE.

NEW CAPABILITIES

The following new capabilities will be added to VFG's in BCS11.

optionality

VFG's will be optional and can be sold in a separate package. They will be available without the INWATS/OUTWATS package and a new selector will be provided in table IBNRTE to use them.

queueing:**Table Control:**

Any route which routes via a VFG and which can be queued for (i.e. Outwats, VFG), must provide the OHQ, CBQ, and EXP bools in table control. Queueing will be allowed on 'size' VFGs only. VFGs of type 'uses' will not provide queueing as queueing for both ends of a trunk would cause excessive glare.

The result

of queueing for a VFG will be the same as queueing for a trunk and would be activated (by the caller) in exactly the same manner. The caller should not be able to distinguish between queueing for a trunk and queueing for a VFG.

Data Changes While Queued:

Changing a VFG from SIZE to USES will not be allowed if there is route which allows queueing on it. Changes from USES to USES or SIZE will not have any effect on queueing.

Deleting a VFG (and possibly re-adding it) will cause the queue for the VFG to be destroyed. IF the VFG is the only facility being queued for, the call will time out.

REVISION HISTORY

	<u>issue</u>	<u>revised by</u>	<u>date</u>	<u>rc³</u>	<u>reasons</u>
aa01	g.meszaros		820917		creation
aa02	g.meszaros		821013		revise after did/design review
aa03	g.meszaros		821123	*	revise restrictions on queueing for 'uses' VFGs. Queueing will not be permitted on both ends of a 2-way VFG.

³ RC = Revision Code in left margin.

Package	NTX112AB03 IBN - VIRTUAL FACILITY GROUPS
Feature set	IBN
Feature	CLASS 5 IBN INWATS
Feature no	F2359

FEATURE SYNOPSIS

With this feature, INWATS calls coming into a listed directory number are forwarded by the attendant to the appropriate line in the customer group. A virtual trunk group is used to define the size of the Inwats group, its class of service and zone restrictions.

FEATURE DESCRIPTION

Package	NTX112AB03 IBN - VIRTUAL FACILITY GROUPS
Feature set	IBN
Feature	TRK GRP BUSY OF VIRTUAL FACILITY GRPS ON ATTENDANT
Feature no	F3789

FEATURE SYNOPSIS

This feature will allow an attendant console to query the status of a Virtual Facility Group (VFG).

FEATURE DESCRIPTION

This feature consists of two distinct flavours. The first is Virtual Group Busy (VGB); this is required to indicate to the attendant the status (BUSY or IDLE) of the VFG. The status will be signified by lamp states.

The second flavour is used when there are more than one VFG per customer group and it is not feasible to assign numerous dedicated keys to provide the service. For this reason Global Virtual Group Busy (GVGB) is provided. This will allow the console operator to choose which VFG is to be monitored. Because of the volatility of the data involved, GVGB will provide a snapshot of the current status and provide indication as to the VFG's availability by visual display on the console. This will allow the attendant to query any VFG in the consols customer group at any time to obtain status reports.

Package	NTX112AB03 IBN - VIRTUAL FACILITY GROUPS
Feature set	IBN
Feature	ATTENDANT CONTROL OF VFG
Feature no	F3791

FEATURE SYNOPSIS

This feature will allow attendants to limit access to virtual facility groups within their customer group, at their discretion via a single key depression.

FEATURE DESCRIPTION

When virtual facility access control (VAC) is in effect, attendants can, at their discretion, give a caller access to the controlled VFG by non-delay or delayed operation. An attendant can also give a station access by through dialling.

If VAC has been applied to a VFG and there is an alternate route, an attempt will be made to complete the call via the alternate route. If the VFG, with VAC active, is the last or only choice in the route list, then intercept treatment may be applied.

Attendant control over a VFG can be achieved by one of the three ways:

- One dedicated lamp and key per VFG
- VFG control through a special key, Global VFG access control key (used when there is more than one VFG per customer group) followed by a VFG number
- Wildcard key

Package	NTX112AB03 IBN - VIRTUAL FACILITY GROUPS
Feature set	IBN
Feature	VFG USAGE DATA
Feature no	F3841

FEATURE SYNOPSIS

The virtual facility group (V.F.G.) is a software entity which is used to implement INWATS and OUTWATS. This feature provides for traffic usage measurements on virtual facility groups. It can be used to accumulate traffic usage measurements on WATS circuits.

FEATURE DESCRIPTION

The present operational measurements on VFG are:

VFGTOTAL - number of outgoing call attempts

VFGBLCKD - number of outgoing call attempts which were unable to find an idle resource

VFGLSCBL - number of outgoing call attempts which were blocked by screening code restrictions.

This feature will add a traffic usage OM to the existing OM on VFG (VFG TRU). VFG TRU will provide an indication of the amount of traffic using each VFG during the measurement interval.

There will be one VFG TRU for each VFG. The usage will be accumulated using a 100 second scan rate. Every 100 seconds the VFG TRU will be incremented one for each member in the VFG which is call processing busy.

Package	NTX112AB03 IBN - VIRTUAL FACILITY GROUPS
Feature set	ADMINISTRATION
Feature	VFG INWATS OVFL TOTALS TO AMA TAPE - IBN
Feature no	G0003

FEATURE SYNOPSIS

This feature provides Inward Wide Area Telephone Service (INWATS) overflow pegging on Virtual Facility Groups (VFG's) used to route INWATS calls to Integrated Business Network (IBN) stations. These overflow peg counts are written to the Automatic Message Accounting (AMA) stream as call code 071 Bellcore format AMA records on a periodic basis for use by Telco in providing billing information to the customer.

FEATURE DESCRIPTION

Prior to this feature there were no INWATS pegging counters assigned to VFG's used for INWATS. INWATS overflow pegging was only maintained on POTS INWATS lines. This feature implements INWATS overflow pegging on VFG's and the capability to display and reset this information via the REGISTER command. In addition, the INWATS overflow audit which runs periodically in the DMS now generates INWATS overflow records for VFG INWATS as well as POTS INWATS. The audit resets the overflow counts to zero after they are used to generate a record. This audit is present only with the Bellcore format AMA package.

VFG INWATS overflows are pegged when the following two conditions occur:

- 1) The call is an INWATS call to a VFG.
- 2) No VFG member is available for the call.

Ref: FDOC AL0603

Package	NTX113AA01 IBN - AUTOVON INTERFACE
Feature set	INTERFACES
Feature	PRECEDENCE CALL TRANSFER
Feature no	F1634

FEATURE DESCRIPTION

This feature provides a Precedence Deflection Route (PDR) for incoming PNID Autovon calls which cannot complete.

All incoming Autovon calls with a precedence level higher than routine, that cannot terminate because of:

1. called party does not answer,
2. blank directory number,
3. called party busy with another call,
4. called party not allowed to receive Autovon calls,
5. all tie trunks to DPABX busy and not preemptable,

will be routed to either a Precedence Deflection Route or an attendant console..sp DEFINITION

CND - the conditional route selector of the IBNRTE table

AC - attendant console selector in the IBNRTE table

IBNTREAT - the IBN treatment table

IBNRTE - the IBN routing table

PDR - Precedence Deflection Route

SDPARMS - Scopedial Parameters Table

EXISTING FEATURE OPERATION

This feature is intended to ensure termination of precedence calls in a scopedial office. Currently any failure to terminate, (busy line, vacant code, timeout on a trunk), causes hard-coded rerouting of the call to an attendant console. The attendant console is determined by the customer group and subgroup of the call's original destination, or defaulted to

zero. Some offices may have a 24-hour operator at another location and require unanswered precedence calls to route there.

NEW FEATURE OPERATION

Deflection of precedence calls will now be done via datafill. Each customer group can specify the routing of deflected precedence calls with an ibn treatment in the IBNTREAT table. The ibn treatment to be used for the deflection treatment will be specified in SDPARMS for each customer group. This "DEFLECT" treatment will default to ibn treatment 0 until the tuple in SDPARMS has been changed for the customer group. If deflection to a special route is not required, this ibn treatment should be the ici of the attendant console. This will ensure termination of the call at an attendant console when it can not terminate on its original destination.

When using the Precedence Deflection feature, the T route of the ibn treatment should be an IBNRTE which uses the CND selector. The CND route selector can be used to test whether an attempt has been made to deflect the call. If the call has not been deflected before (PDR FIRST), the route list can jump to the Precedence Deflection Route¹, otherwise (PDR LAST), to an AC route selector because the PDR failed (e.g. line was busy). PDR LAST will always route a precedence call if PDR FIRST is not there, or fails. Routine calls sent to the DEFLECT treatment in IBNRTE would fail both PDR tests and fall through to the remaining elements in the list.

NEW ATTENDANT CONSOLE ROUTE

A new selector in IBNRTE will provide the ability to send a call to an attendant console in a chosen customer group and subgroup. The customer group and subgroup supplied can be used as an 'override' of the calls associated customer group, subgroup or as a 'default' when there is none associated with the call. Override is specified as 'y' for the OVERRIDE field, default is 'n'. The ici code can also be specified for non-precedence calls. Precedence calls will use the corresponding precedence ici code.

DATA FILL EXAMPLE

The following tuples illustrate the conditional route for PDR. The DEFLECT treatment for the customer group is 5. The first deflection of a precedence call will go to IBNRTE 11. If IBNRTE 11 fails, the call will

¹ See Feature Interaction section for restrictions on Precedence Deflection Route

be deflected to the customer group COMKODAK, subgroup 0, ici (prec. level). Note that as well as overriding the ici code, precedence calls always go to subgroup 0. A non-precedence call going to this AC selector would go to customer group COMKODAK, subgroup 2, ici 10.

TABLE IBNTREAT

IBNT_KEY ITDATA

COMKODAK 5 Y T IBNRTE 9

TABLE IBNRTE

RTE RTELIST

9 (CND PDR FIRST ST 11) (CND PDR LAST ST 12)

11 (N N N N AVTRUNK 3)

12 (AC Y COMKODAK 2 10)

NTX119AA02 Status: RTM IBN-MESSAGE SERVICE

SERVICES	:	
STATION MESSAGE WAITING		F1479
P_PHONE MESSAGE WAITING		F1481
ATTENDANT MESSAGE WAITING		F1625
MESSAGE WAITING LAMP - LINK PHONE		F3413
MESSAGE WAITING LINE CARD FACILITY MNTC		F3414
STUTTERED DIAL TONE FOR MESSAGE WAITING		F3446

Package	NTX119AA02 IBN-MESSAGE SERVICE
Feature set	SERVICES
Feature	STATION MESSAGE WAITING
Feature no	F1479

FEATURE SYNOPSIS

This feature provides notification to users that a message has been queued against their directory number. In case a message waiting lamp is provisioned on the set, the lamp will be used to give a visual indication. If a message waiting lamp is not provisioned on the set, then an audible indicator i.e. a stuttered dial tone will inform the user that a message is waiting.

FEATURE DESCRIPTION

The feature can be implemented by either using a Message Center (one or more attendants) where unanswered or busy calls are diverted, or by using a message queuing capability without the use of the message center.

The message center allows an incoming trunk call and/or internal call to be automatically routed to the message center if the call is not answered at the original destination.

The called station can be provided with an audible or visual indication that a message is waiting and can retrieve messages by directly accessing the message center.

Using the message queuing capability the feature will operate as follows: A calls an idle station B. B does not answer. A flashes the switchhook and dials the call request activate feature code. Station B notices the call request indication (visual or audible) that another station wishes to be called back. B originates and dials the call request retrieve feature code and A is automatically rung. Multiple call requests on a station are supported.

Package	NTX119AA02 IBN-MESSAGE SERVICE
Feature set	SERVICES
Feature	P_PHONE MESSAGE WAITING
Feature no	F1481

FEATURE SYNOPSIS

This feature allows the p-phone user to be notified of any messages. The functions of message waiting and call request are similar for p-phones and 500/2500/link phones.

FEATURE DESCRIPTION

A message waiting lamp is used to indicate to the station user that a message is waiting at the message center and/or via call request. If the customer group has defined a message center, the user will dial the message center directory number to retrieve messages.

The message center attendant will control the DN's message lamp. The call request feature also uses the message waiting lamp to indicate to a station user that another station wishes to talk to him.

To retrieve a message from the message center the user will dial the message center directory number.

Call Request

Call request will allow message queuing between stations. A visual message indicator will alert the station user than another station user wishes to be contacted. A station cannot have Call Request without Three Way Calling/Call Transfer and Message Waiting.

Call Request Activation

Station A calls station B. No answer or busy tone is received from station B. To leave B a call request, B must have Call Request capabilities and A must have Three Way Calling/Call Transfer on his station. A initiates the following:

1. Depress Three Way Calling/Call Transfer key (for code access).
2. Dial Call Request Activate (CRA) feature code.
3. A hears confirmation tone indicating that a request is queued for B.
4. Go on-hook.

Deactivation

Station B's message waiting lamp is ON indicating another station requests B to call.

1. Go off-hook.
2. Dial Call Request Retrieve feature code. Station A receives ringing.
3. Lamp is set OFF (providing no other messages are queued).

If A is busy or does not answer, B will hear busy tone or ringing respectively, and the call request will remain queued. The message waiting lamp will remain ON. If on call back, A has telephone service removed, i.e. plug-up or suspended, B will receive reorder tone and the request will be dequeued.

Multiple call requests can be queued for a station. Call Request retrieval will be served in the order they arrived.

Package	NTX119AA02 IBN-MESSAGE SERVICE
Feature set	SERVICES
Feature	ATTENDANT MESSAGE WAITING
Feature no	F1625

FEATURE SYNOPSIS

The message waiting capability consists of one or more attendant consoles. Stations will be allowed to forward calls to the message center where messages are stored and message waiting is activated for the station. Stations will be able to retrieve messages from the message center. Two or more customer groups can share a message center.

FEATURE DESCRIPTION

Attendant consoles used as the message center must be equipped with one MSG INDIC key/lamp pair if message waiting activation and cancellation control is required. On attendant consoles, message calls are indicated by a message center ICI key. A DIRECT ICI and INDIRECT ICI must be provisioned on the console. The ICI denotes the type of call to the attendant. Therefore, the attendant can choose between callers wishing to leave a message i.e. INDIRECT calls and callers wishing to retrieve messages i.e. DIRECT calls.

All stations can have message waiting capability. 500/2500 sets can be allowed message waiting using a visual indication (i.e. lamp). In case a lamp is not provisioned on the set an audible indication can be provided (a stuttered dial tone).

Package	NTX119AA02 IBN-MESSAGE SERVICE
Feature set	SERVICES
Feature	MESSAGE WAITING LAMP - LINK PHONE
Feature no	F3413

FEATURE SYNOPSIS

The link phone is a telephone offering from Northern Telecom that is equipped with a message waiting lamp and a line interrupt circuit activated by a dedicated button (flash button). The lamp will be OFF when:

- 1) There are NO messages queued for the station and the station is ON-hook.
- 2) The station is OFF-hook.

The lamp will be flashing at 60 IPM when:

- 1) There are messages queued for the station and the station is ON-hook.

Package	NTX119AA02 IBN-MESSAGE SERVICE
Feature set	SERVICES
Feature	MESSAGE WAITING LINE CARD FACILITY MNTC
Feature no	F3414

FEATURE SYNOPSIS

This feature provides for diagnostic tests to check the lamp and the message waiting line card.

FEATURE DESCRIPTION

The telephone faceplate of a 500 or 2500 set may be equipped with a light. This light flashes once every second to acknowledge that a message is waiting for the customer. He or she can then dial the message center for the information.

As a side effect, the lamp also provides a visual ringing indication. That is, it will light in accordance with the physical ringing of the telephone.

To maintain the integrity of the message waiting feature, diagnostics are required. A short diagnostic is run on a per message basis to monitor the integrity of the bulb at the customers unit. This will diagnose a faulty bulb each time the message waiting lamp is activated.

A long diagnostic is carried out in the ALT or LTP modes from the MAP level. This detailed diagnostic analyzes the message waiting line card and the 150V supply card (required to power the line cards) for any faults. It distinguishes between a lamp failure and a card failure and tries to indicate the faulty device. During the lamp test the bulb will flash at least once.

Package	NTX119AA02 IBN-MESSAGE SERVICE
Feature set	SERVICES
Feature	STUTTERED DIAL TONE FOR MESSAGE WAITING
Feature no	F3446

FEATURE SYNOPSIS

Stuttered dial tone will be used to inform users that a message is waiting for them. Stuttered dial tone is used for stations without message waiting lamps. The feature is supported on line modules (LM's) and line concentrating modules (LCM's).

FEATURE DESCRIPTION

Stuttered dial tone is defined as 160 millisecc of dial tone (350/440 hz) followed by 160 millisecc of silence repeated.

It takes the place of regular dial tone upon call origination if a message is queued for the station. A line option specifying stuttered dial tone is required for lines with the stuttered dial tone option for message waiting.

This stuttered dial tone option will be the notification type for the Message Waiting (MWT) line option. Feature interaction lines with the stuttered dial tone option and a message queued will receive stuttered dial tone at the time of origination. Stuttered dial tone will be removed when the first dialed digit is received.

Stuttered dial tone will only be heard on a regular two port call (A goes OFF-hook to call B). It will NOT be heard at any other time. Therefore, if a station invokes 3WC, the station established conference feature, etc, dial tone as defined for those features will be heard.

Package	NTX120AA01 OFFICE HARDWARE INVENTORY PACKAGE
Feature set	ADMINISTRATION
Feature	OFFICE HARDWARE INVENTORY PACKAGE
Feature no	F2350

FEATURE SYNOPSIS

The object of implementing this feature is to provide telcos with a mechanism for establishing and maintaining an inventory of operational and spare circuit packs associated with a DMS-100 family central office switch. This resulting data base would also be used by Northern Telecom for support, engineering and change control purposes.

FEATURE DESCRIPTION

The feature is implemented as an optional standalone resident feature and will be included in NTX120AA package. This feature implements two tables called OHIP and OHIPBULK. Table OHIP is capable of keeping track of all the inservice hardware inventory (including HOST and REMOTES) except line cards. Table OHIPBULK keeps track of all the spare circuit packs and all line cards on a quantity basis if required. Both of these tables are implemented using the existing Table Editor and New Table Control. The data will be stored in memory (data store).

Note that the OHIP and OHIPBULK tables are interdependent, ie it is not possible to have one of the tables without the other. MAN-MACHINE INTER-FACE

Each tuple in table OHIP is associated with a particular SITE_NAME and circuit pack slot position and has the form:

< SITE_NAME, LOCATION, PEC, RELEASE, STATUS, DATE >

where:

SITE_NAME identifies the site to which the circuit pack belongs. It can be any 4 character alphanumeric defined to be legal for that office. Note that HOST is legal in all offices and that the maximum number of possible sites is 32.

LOCATION indicates the location of the corresponding circuit pack slot position. The <LOCATION> is itself a tuple, of the form:

< FRAME_NAME, FRAME_NO, SHELF_POS, CARD_NO >

Currently the following frame names are defined in the system: CCC, MEX, NET, DNI, MTC, TME, DCE, PDC, SLC, RSE, MIS, MSS, LGE, DTE, LTE, LCE, MS6E, MS7E, STE

If any new frame names are added to the system, they will be accessible to this feature automatically.

PEC is the NT Product Engineering Code for the circuit pack (e.g. 2X67AB). It must be exactly 6 alphanumeric, but no checks are made for PEC code validity. Note that a maximum of 511 PECs is allowed.

RELEASE is the NT release designation for the pack. It must be exactly 2 alphanumeric, but again no check for validity is made.

STATUS indicates the circuit pack's status as follows:

<u>Status</u>	<u>Description</u>
U	unequipped
O	ordered
D	delivered
I	installed
R	replaced
B	borrowed

DATE indicates the date, in the form YYMMDD. The craftsman will be allowed to enter the date. The date will be checked for validity. If incorrect, it will be prompted back. If the craftsman does not want to type in the date he can enter ' ' and the system date as generated by the DMS switch will be used.

The Key field for uniquely accessing tuples in table OHIP is the combination of SITE_ID and LOCATION. Each tuple in table OHIPBULK will have the form:

< SITE_ID, PEC, RELEASE, STATUS, QUANTITY, DATE >

where SITE_ID, PEC, RELEASE, and DATE are as described earlier. The remainder of the fields are as follows:

STATUS is as described earlier with the following addition:

<u>Status</u>	<u>Description</u>
S	spare

QUANTITY is the total number of circuit packs of that type.

The Key field for uniquely accessing tuples in table OHIPBULK is the combination of SITE_ID, PEC, RELEASE, and STATUS.

Table OHIPBULK will be used to keep track of spare circuit packs. If required, the customer can also use this table to control his inventory of line cards. utilizing the Table Editor as the user interface mechanism means that a wide variety of commands, already familiar to the customer, can be used. For example:

(a) To update a record in table OHIP, say 'HOST DCM 1 14 9', the craftsperson can position to the tuple by typing:
POS HOST DCM 1 14 9
Then the tuple can be updated by issuing the command 'CHA'.

(b) Similarly to find out the status of all the circuit packs with PEC 1X55AA and RELEASE 01 the following can be typed:
LIST ALL ((PEC EQ 1X55AA) AND (RELEASE EQ 01))

Access to the data base by NT can be in either of two ways:

(a) One method is for NT to log on to the switch using a remote hard-copy terminal or an intelligent terminal (e.g. NT503) via the ETAS port and use the Table Editor to print out the required information.

(b) The other method is to generate a file (perhaps on tape) containing the required information on the switch (using Table Editor preceded by a SEND command). This file can then be retrieved by NT to update the ORR database residing on the IBM-3081.

The table will initially be datafilled with Northern Telecom's latest view of the TELCO's hardware and kept updated by the TELCO maintenance staff to reflect any changes made to the office inventory. The initial datafill is to be done by the customer, but can be contracted out to NT if negotiated.

Data in these tables will be accessed by the Change Control department for change application purposes and by Customer Engineering for office extensions.

The existing dump/restore facilities will be used to retain tables across BCS releases.

Journal files will be used to update the tables in the event of a reload from a previous image.

NTX121AA01 Status: RTM OVERLAP OUTPULSING (TRK TO TRK)

SWITCHING AND TRANSLATION :
OVERLAP OUTPULSING TRUNK TO TRUNK F2319

Package	NTX121AA01 OVERLAP OUTPUTSING (TRK TO TRK)		
Feature set	SWITCHING AND TRANSLATION		
Feature	OVERLAP OUTPUTSING	TRUNK TO TRUNK	
Feature no	F2319		

FUNCTIONAL DESCRIPTION

dsad

Overlap outputting is a method of outputting developed to minimize post dialling delay (the period from completion of dialling to audible ringing). With overlap outputting, the call is advanced toward its destination as soon as sufficient address information is available. Once a call is advanced, the last set of digits is sent forward as soon they are all received.

It should be noted that overlap outputting is a cross-threaded capability; that is, it is possible and useful only for certain pairs of incoming and outgoing call processing agents. It has been implemented for line to outgoing local dial pulse (DP) trunks. Feature R0319 will implement this capability for pairs of DP trunks of the following trunk group types:

INCOMING:	OUTGOING:
1. 1W & 2W intertoll	1. 1W & 2W intertoll
2. 1W & 2W local	2. 1W & 2W local
	3. 1W & 2W IBN

Incoming CAMA/TSPS trunks are excluded because they route the call to the destination only after the ANI spill. Since the spill is initiated only after all the called digits are collected, overlap outputting can be done.

To provide another level of control on this feature on a per subgroup basis, a new boolean attribute will be added to the incoming trunk subgroup data tuple. If the outputting type is DP and overlap outputting desired, this bool must be set to Y; otherwise, to N.

The line to DP trunk overlap outputting implementation starts outputting after routing translation a digit at a time, incurring an 80 percent increase over the normal call processing CC activity. Feature R0319 will be implemented to start outputting after N-2, and then N digits, where N is the number of digits expected on the incoming trunk. For local trunks overlap will commence when MINDIGS and enough digits to translate are received. Since the variable digit selector for local trunks defaults to 7, trunk subgroup data must be engineered for efficient overlapping (mindigs set to whatever digit count will determine a route.

This incurs a 20 percent increase in CC activity.

Package	NTX122AA02 OM - CALL ATTEMPTS SUMMARY
Feature set	ADMINISTRATION
Feature	BASIC OPERATIONAL MEASUREMENT - CALL DISPOSITION S
Feature no	F2345

FEATURE SYNOPSIS

This feature provides the following counters\ machine blockage, NCA incoming, NCA outgoing and total machine attempts. This information is available in the OM tables and from the MAP.

FEATURE DESCRIPTION

Package	NTX127AA01 WARM LINE
Feature set	SERVICES
Feature	WARM LINE
Feature no	F2400

FUNCTIONAL DESCRIPTION

The warm line feature (WML) is basically a time delayed automatic line.

If a subscriber with a warm line feature goes offhook and commences dialling within the time delay period, the call will proceed normally. If dialling has not started before the end of the time delay period, the call is treated as an automatic line (hot line). The called number, specified in the line data (LENFEAT), will be loaded and used as the forward number.

The time delay is specified on a per-line basis, and stored in the line data (LENFEAT). Its value may range from 0 to 20 seconds, with a usual value being 4 or 5 seconds.

Subscribers with digitone stations may avoid the time delay by keying the octothorpe to activate the automatic number outpulsing.

Information for this feature will be stored as a new data_feature cell in the LENFEAT table. The WML cell will have four sub-fields (1) CUSTMOD of type boolean, (2) ACTIVE of type boolean, (3) DN of type digit_register, and (4) TIMEOUT of type int which specifies the time delay period. TIMEOUT will be converted to 160 ms units in physical store.

The ACTIVE bit indicates whether or not the feature has been activated.

If the CUSTMOD bit is set, the subscriber has the capability of resetting the forward number at any time using a procedure similar to that of setting speed calling or call forwarding numbers. He goes offhook, receives dialtone and dials the update code, XX. The update code will be specified by the Telco using office parameter WML_ACCESS_CODE located in table OFCVAR. Special dialtone is received after a 4-second timeout. (Digitone subscribers may circumvent this by keying the octothorpe.) The subscriber then dials the number (which contains at least one digit) which is to become the forward number, including all prefix digits necessary for normal dialling of that number. Again there is a short timeout to determine that all digits have been received (digitone subscribers may key octothorpe). There will be no verification done of the forward number - the subscriber should try a call to check that he has set it correctly. The number will be recorded in the LENFEAT table and confirmation tone returned to the subscriber. Should the subscriber not key in any digits after receiving special dialtone, it will be interpreted that he wishes to deactivate the feature. DN will not change, however ACTIVE will be set to N, and confirmation tone returned. The feature can be reactivated by dialling the access code, and giving a forward number after special dialtone is received.

If the CUSTMOD bit is not set, only the Telco may change the number, using a service order, and the subscriber may not activate and deactivate the feature.

When WML is initially applied to a subscriber's line, the Telco will assign the forward number (their choice of a default value, or following customer request) using a service order.

If a subscriber without the warm line feature, or without the modification capability dials the change code, partial dial treatment is returned.

In offices with journal file record, updates by customers to warm lines will be recorded. If the journal file is inactive, there will be no journal file record, however the update will be recorded in the line data, and a log printed indicated that the update was not recorded in the journal file.

Interaction with other features =====

- (1) Warm Line (WML) is independent of and incompatible with Automatic Line (AUL), Manual Line (MAN), and Denied Origination (DOR).
- (2) WML can exist on 1FR, 1MR, CSDDS, ZMD, and ZMZPA lines.
- (3) WML may coexist with speed calling (short and long).
- (4) A subscriber may use a warm line feature to initiate the second call of a three-way-call. However, he may not use the second call to assign the forward number.
- (5) There is no interaction or incompatibility with call forwarding.

Package NTX129AA02 TWO WAY OPERATOR OFFICE TRUNK
Feature set SWITCHING AND TRANSLATION
Feature TWO WAY OPERATOR OFFICE TRUNKS(TWOOT)
Feature no F2207

BACKGROUND -

In BCS6, facility was provided so that calls coming in on SCama (Super-Cama) trunks can terminate on RC (Recording-Completing) trunks. SCama trunks can either be Incoming or 2-way trunks. Provision was available to provide Audible-ringing to the originator by specifying it in the RC trunk data in the BCS6 loads.

Feature C0493 (BCS9), provided a facility by which telcos can select the type of supervision needed on Scama to Recording-Completing calls.

A new field was added in the RC trunk-group data:

HOLDTYPE (nohold, jnthold, termhold)

- If nohold is specified, the call will come down whenever either the originator or the terminator goes on hook.
- Jnthold will bring the call down only if both parties are on hook.
- Finally, selecting termhold will make the call go down when the terminator goes on hook.

This new field is only valid on SC to RC calls.

Super-Cama to Recording-Completing calls could however not support in-band coin control signals.

In-band coin control signals are made-up of an on-hook wink followed by a Mf signal.

This feature is part of the switched access of Two Way Operator Office trunks feature and will allow SC to RC calls terminating on 3cl boards to handle in band coin-control signals.

NTX134BA02 Status: RTM REMOTE OPERATOR CENTRALIZATION DATA LINK

ADMINISTRATION	:	
OPERATOR CENTRALIZATION - REMOTE		F1317
TOPS	:	
REMOTE ONI VIA O.C.		F2602

Package	NTX134BA02 REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING
Feature set	ADMINISTRATION
Feature	OPERATOR CENTRALIZATION - REMOTE
Feature no	F1317

FEATURE SYNOPSIS

FEATURE DESCRIPTION

OC (Operator Centralization) is a feature which allows a single DMS TOPS switch (the HOST) to provide operator services for several remote DMS Toll Switches (the REMOTES). Communication between the Host and the Remotes is by means of digital data links (2 for reliability) and digital or analog voice links (provisionable).

The facilities/functions which are provided at the Remote are:

- a. Operator calls recognition - recognize the need for operator assistance on the basis of trunk type (dedicated call type or station type or travelling class marks contained in received digits).
- b. Communication with Host - forward all pertinent information to the HOST via data channels in a call arrival message.
- c. Rating system - send rating results to the HOST for display to operator.
- d. AMA recording - generate AMA records based on pertinent operator keying input received over the data link.
- e. Hotel administration system - Generate voice quote and/or Autoquote printer messages.
- f. Trouble reporting system - generate trouble report messages based on operator input while pertinent call is connected to the operator. Route to appropriate printer.
- g. Operational Measurement - provide OM for the operator Centralization data and voice links.

It is to be noted that a Remote switch will not support RONI trunks. All RONI services for an OC configuration must be provided using RONI trunks terminating on the Host.

Package	NTX134BA02 REMOTE OPERATOR CENTRALIZATION DATA LINK HANDLING
Feature set	TOPS
Feature	REMOTE ONI VIA O.C.
Feature no	F2602

FEATURE SYNOPSIS

Remote Operator Number Identification (RONI) is provided on an office equipped with the operator centralization (OC) remote package.

FEATURE DESCRIPTION

This feature will make RONI compatible with the OC environment as well as standalone.

The method applied here is the concept of gating. Instead of duplicating everything for each environment a 'gate' is added in common code to access environmental specific functions.

The two environments in TOPS are:

- stand alone
- centralized

A table is set up to be indexed by environment and the type of function to be performed.

NTX136AA03 Status: RTM AUTOMATIC TRANSMISSION MEASURING SYSTEM

MAINTENANCE AND TESTING	:	
MANUAL OR SCHEDULED AUTOMATIC TESTS		F1122
ORIGINATION OF 105 TEST TYPES		F1123
ERL AND SRL CAPABILITY TO ATMS'		F3828
105 TESTLINE ERL/SRL		F5409

Package	NTX136AA03 AUTOMATIC TRANSMISSION MEASURING SYSTEM
Feature set	MAINTENANCE AND TESTING
Feature	MANUAL OR SCHEDULED AUTOMATIC TESTS
Feature no	F1122

FEATURE SYNOPSIS

This feature provides flexible scheduling of two way transmission loss and noise measurements to distant office 105 terminating test line. Manual or automatic testing can be scheduled on the ATT or TTP MAP.

FEATURE DESCRIPTION

Package	NTX136AA03 AUTOMATIC TRANSMISSION MEASURING SYSTEM
Feature set	MAINTENANCE AND TESTING
Feature	ORIGINATION OF 105 TEST TYPES
Feature no	F1123

FEATURE SYNOPSIS

This feature provides flexible scheduling of two way transmission loss and noise measurements to distant office 105 terminating test line. Manual or automatic testing can be scheduled on the ATT or TTP MAP.

FEATURE DESCRIPTION

Package	NTX136AA03 AUTOMATIC TRANSMISSION MEASURING SYSTEM
Feature set	MAINTENANCE AND TESTING
Feature	ERL AND SRL CAPABILITY TO ATMS'
Feature no	F3828

FEATURE SYNOPSIS

The purpose of this feature is to provide an addition balance test; echo return loss (ERL) and singing return loss (SRL) to existing 105 originating test line.

FEATURE DESCRIPTION

This feature provides the DMS 105 originating test line capability to perform return loss measurements; ERL and SRL (low and high).

The test can be requested from the TTP or ATT. The commands to be used to request the tests are listed in section test commands.

More than one test can be performed with a single test connection. The additional tests that can be performed are as follows:

a) Return Loss Measurement

far-to-near return loss measurement with quiet termination.

near-to-far return loss measurement with quiet termination.

b) Self Check

return loss self check with quiet termination

Test Description

The description of the additional tests represented by the types are as follows:

ERL - echo return loss measurement

ERLSC - echo return loss self check

SRL - low frequency return loss measurement

SRLSC - low frequency return loss self check measurement

SHI - high frequency return loss measurement

SHISC - high frequency return loss self check measurement

Ref: FDOC BC0326
FDOC BC1157

Package	NTX136AA03 AUTOMATIC TRANSMISSION MEASURING SYSTEM
Feature set	MAINTENANCE AND TESTING
Feature	105 TESTLINE ERL/SRL
Feature no	F5409

FEATURE SYNOPSIS

This feature includes ERL/SLR test capability to the 105 test line.

FEATURE DESCRIPTION

The echo return loss (ERL) and singing return loss (SRL) measurements of band limited white noise signal over trunk circuits is provided as additional test capability of 105 test line. This feature adds 6 each of originating and terminating tests to the 105 test line.

The following are hardware related requirements:

NT2X47AD - MU-Law TTU with 105 ERL/SRL
NT1V04AB - 105 ERL/SRL Prom F/W

This feature needs ATMS features BC1157 and BC1083.

Reference

FDOC - BF0547

Package	NTX139AA01 REVERTIVE PULSING ON DIGITAL LINES
Feature set	SIGNALING
Feature	REVERTIVE PULSING SIGNALLING ON DTC
Feature no	F2420

FEATURE DESCRIPTION

1.0 INTRODUCTION

Revertive pulsing is a DC signalling type which consists of transmitting the pulses backward from the terminating office to the originating office. A start/seizure signal received on an incoming trunk causes this trunk to commence transmitting pulses back to the originating office. The originating office counts the pulses and sends a stop signal to the terminating office to indicate end of selection. The terminating office stores the pulse count and the cycle repeats until all the selections are received. The terminating office then sends an incoming advance signal to indicate it has successfully received all the selections. The originating office should establish the talking path upon reception of this incoming advance signal.

2.0 DESCRIPTION

The translation and routing systems used in the DMS-100, provides all the capabilities required to support revertive pulsing calls described below.

- Incoming RP calls with low/high five
- Outgoing RP calls with low/high five
- Tandem RP calls with low/high five

NTX140AA02 Status: RTM TOPS DIAL UP AUTOQUOTE

TOPS	:	
300 BAUD DIAL-UP AUTOQUOTE		F2428
CC SUPPORT FOR THE DUAQ MODEMS		F5551
	:	
1200 BAUD DIAL-UP AUTOQUOTE		F5743

Package	NTX140AA02 TOPS DIAL UP AUTOQUOTE
Feature set	TOPS
Feature	300 BAUD DIAL-UP AUTOQUOTE
Feature no	F2428

FEATURE SYNOPSIS

The dial up autoquote feature allows hotel billing data to be accumulated and transmitted to a receiving device over a switched network path.

Currently hotels receive billing information either over dedicated lines to their autoquote devices or verbally from an operator of the hotel billing information center. With the dial up autoquote feature, expensive dedicated lines are not required since the hotel device can be accessed in the same fashion as any remote telephone set.

FEATURE DESCRIPTION

When a hotel originated call ends, the system determines if the associated billing record must be sent to a DUAQ device. This is done by checking table SPLDNID for the hotel billing number. If the receiving device is identified as DUAQ, then the billing record is placed in the DUAQ queue. The collection threshold of records held (RECHELD) and time period of minutes held (MINHELD) for each hotel queue is contained in table HOBICDEV. When the collection threshold is reached or the holding time expires, a network path to the DUAQ device is established and the collection of records transmitted to the hotel. After transmitting the last record the network path is released. Whenever a new collection of billing records is ready for transmission, the network path to the receiving DUAQ device is reestablished.

Reference: FDOC BR0428

Package	NTX140AA02 TOPS DIAL UP AUTOQUOTE
Feature set	TOPS
Feature	CC SUPPORT FOR THE DUAQ MODEMS
Feature no	F5551

FEATURE SYNOPSIS

This feature provides the necessary software to support a new analogue modem required for dial up auto quote applications in the HOBIC environment, or to transmit billing data in batches.

FEATURE DESCRIPTION

The dial up auto quote feature allows hotel billing data to be batched and transmitted to the receiving device (the hotel teleprinter) over a switched access circuit. The existing digital modems (NT3X02 and NT3X03) do not have the capability to detect the carrier from the auto answer modem and hence a new analog modem is introduced to provide the answer detection (to recognise carrier signal) from the receiver terminal.

The analog modem is connected to the signal processor in the MTM (NT3X02) via an RS232 port and its output (modem output) is connected to the trunk module as an incoming trunk. The auto answer modem at the receiving end is also connected to a trunk module as an outgoing trunk.

When the system decides to transmit a batch (block) of billing data to a customer premises, it selects a free modem from the DUAQ modem pool (queues up) and a network path is established between the incoming trunk to which the selected modem is connected and the outgoing trunk to the customer premises modem. The receiving modem sends the PTS (proceed to send) in the form of a carrier tone which is recognised by the DUAQ modem and the billing data is sent down.

Initially only 300 band modems shall be supported and 1200 band speed shall be available later.

References:

FDOC BC1407

DMS-200 TOPS Hotel System Description NTP 297-2271-102N

Dial-up Autoquote FDOC BR0428

AT&T Compatibility Bulletin #150

Package	NTX140AA02 TOPS DIAL UP AUTOQUOTE
Feature set	
Feature	1200 BAUD DIAL-UP AUTOQUOTE
Feature no	F5743

FEATURE SYNOPSIS

Enhance the dial up autoquote capability by allowing 1200 BPS operation.

FEATURE DESCRIPTION

The dial up autoquote (DUAQ) feature allows hotel billing data to be accumulated and transmitted to a receiving device over a switched network path.

Currently, hotels receive billing information either over dedicated lines to their autoquote devices or verbally from an operator of the hotel billing information center (HOBIC). With the dial up autoquote feature, expensive dedicated lines are not required since the hotel device can be accessed in the same fashion as any remote telephone set.

Ref: BC2138
BR0428

Package	NTX141AA01 TOPS CITY ZONE RATING
Feature set	TOPS
Feature	CITY ZONE RATING
Feature no	F2429

FUNCTIONAL DESCRIPTION

CITY ZONE RATING is an extension of V & H (vertical and horizontal) RATING. It is a data base fill on a per office code basis. 15 different city zones are identifiable in the data base. This is greater than specified in the feature request, i.e. 4, but requires the same amount of store. The customer specifiable rate distance, e.g. 40, allows each city zone the ability to have different rate distances. The V & H calculations are automatically done based on the actual coordinates for the calling and called parties. If the mileage is greater than the customer specifiable rate distance then the called's V & H coordinates are replaced by the city's central coordinates and the calculations are redone. The new mileage is then used with a minimum mileage of rate distance plus one.

This feature will be released in bcs11.

Package	NTX142AA01 DS-1 64 KBPS CLEAR
Feature set	SIGNALLING
Feature	CLEAR CHANNEL 64 KB/S SIGNALLING
Feature no	F6359

FEATURE SYNOPSIS

This feature will provide the basic CC support required for the new 6X50AB carrier interface for XPM DS1 carrier including options which will support its use for clear 64 kbps. Included will be:

- Table control for:
- CARRMTC - new carrier options
- IACPSINV - new CARRMTC index field for IAC carriers
- LTCPSINV - new CARRMTC index field for carriers for DTC, LGC, LTC, SMR, SMS, SMU.
- RCCPSINV - new CARRMTC index field for RCC p-side carriers.

³ Data download for XPMs on the c-side of the carrier.

FEATURE DESCRIPTION

This feature will allow the table CARRMTC of carrier attributes to include the following new fields applicable to the 6X50AB:

³ CARD - NT6X50AA or NT6X50AB

³ FF - Frame format:
 SF - standard format
 ESF - extended superframe format

³ ZLG - zero logic:
 ZCS - zero code suppression
 B8ZS - bipolar 8-bits zero substitution

³ BERB - bit error ratio base:
 BPV - bipolar violation
 CRC - cyclic redundancy code

³ DLK - data link:
 NILDL - nil
 SLC96 - subscriber loop carrier for 96 subscribers
 FDL1 - facility data link: input from time slot 2
 FDL2 - facility data line: input from external interrupt

This feature allows only NILDL, as the XPMs do not support the other options at this time.

³ IAT - inhibit alarm transmit (Y/N)

- ³ LCGAST - local carrier group alarm set threshold
- ³ LCGACL - local carrier group alarm clear threshold
- ³ RCGAST - remote carrier group alarm set threshold
- ³ RCGACL - remote carrier group alarm clear threshold
- ³ AISST - alarm indication signal set threshold
- ³ AISCL - alarm indication signal clear threshold
- ³ BERML - bit error rate maintenance limit threshold
- ³ BEROL - bit error rate out of service limit threshold
- ³ ES - errored second limit
- ³ SES - severe errored second limit

In addition, the default tuples corresponding to CARRMTC index 0 for the various PMS in CARRMTC cannot be deleted, and the only options which can be changed in the default tuples are the ones which are not sent to the associated PMS, viz., ES and SES and the existing thresholds for slips and loss of frame.

The P-side DS1 carriers of the XPMs will now have a new field for the CARRMTC index in tables IACPSINV, LTCPSINV and LTCPSINV. This index can be changed only when the carrier is MANB or OFF1.

When a XPM is returned to service, the information associated with all the CARRMTC tuples used by its p-side carriers along with the CARRMTC indices associated with each carrier will be sent to the XPM with the static data.

Ref: DDOC BC2093

Package	NTX143AA01 DS-1 - ESF
Feature set	SIGNALLING
Feature	ESF USING NTX6X50AB
Feature no	F6507

FEATURE SYNOPSIS

This feature will provide the basic CC support required for the new 6X50AB carrier interface for XPM DS1 carrier including options which will support its use for clear 64 kbps. Included will be:

³ Table control for:

- CARRMTC - new carrier options
- IACPSINV - new CARRMTC index field for IAC carriers
- LTCPSINV - new CARRMTC index field for carriers for DTC, LGC, LTC, SMR, SMS, SMU.
- RCCPSINV - new CARRMTC index field for RCC p-side carriers.

³ Data download for XPMs on the c-side of the carrier.

FEATURE DESCRIPTION

This feature will allow the table CARRMTC of carrier attributes to include the following new fields applicable to the 6X50AB:

³ CARD - NT6X50AA or NT6X50AB

³ FF - Frame format:

- SF - standard format
- ESF - extended superframe format

³ ZLG - zero logic:

- ZCS - zero code suppression
- B8ZS - bipolar 8-bits zero substitution

³ BERB - bit error ratio base:

- BPV - bipolar violation
- CRC - cyclic redundancy code

³ DLK - data link:

- NILDL - nil
- SLC96 - subscriber loop carrier for 96 subscribers
- FDL1 - facility data link: input from time slot 2
- FDL2 - facility data line: input from external interrupt

This feature allows only NILDL, as the XPMs do not support the other options at this time.

³ IAT - inhibit alarm transmit (Y/N)

- ³ LCGAST - local carrier group alarm set threshold
- ³ LCGACL - local carrier group alarm clear threshold
- ³ RCGAST - remote carrier group alarm set threshold
- ³ RCGACL - remote carrier group alarm clear threshold
- ³ AISST - alarm indication signal set threshold
- ³ AISCL - alarm indication signal clear threshold
- ³ BERML - bit error rate maintenance limit threshold
- ³ BEROL - bit error rate out of service limit threshold
- ³ ES - errored second limit
- ³ SES - severe errored second limit

In addition, the default tuples corresponding to CARRMTC index 0 for the various PMS in CARRMTC cannot be deleted, and the only options which can be changed in the default tuples are the ones which are not sent to the associated PMS, viz., ES and SES and the existing thresholds for slips and loss of frame.

The P-side DS1 carriers of the XPMs will now have a new field for the CARRMTC index in tables IACPSINV, LTCPSINV and LTCPSINV. This index can be changed only when the carrier is MANB or OFF1.

When a XPM is returned to service, the information associated with all the CARRMTC tuples used by its p-side carriers along with the CARRMTC indices associated with each carrier will be sent to the XPM with the static data.

Ref: DDOC BC2093

NTX145AA05

Status: RTM REMOTE SWITCHING CENTER

MAINTENANCE AND TESTING	:	
RSC MAINTENANCE		F1357
RSC T1 MAINTENANCE		F1358
RSC RMM MAINTENANCE		F1360
SIGNALING AND SUPERVISION	:	
RSC SIGNALLING CHANNEL SUPERVISION		F1361
ADMINISTRATION	:	
RSC OPERATIONAL MEASUREMENTS		F1366
MAINTENANCE AND TESTING	:	
RSC METALIC LINE TESTING		F1370
RSC LINE TESTING USING LTU		F1371
RSC TRUNK WARM SWACT		F5767
ADMINISTRATION	:	
RCC CSIDE LINK DIAGNOSTIC		F6090
RCC C-SIDE NON CONSECUTIVE LINKS		F6571

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	MAINTENANCE AND TESTING
Feature	RSC MAINTENANCE
Feature no	F1357

FEATURE SYNOPSIS

This feature provides common basic maintenance for the RCC including 7X72 formatter diagnostic.

FEATURE DESCRIPTION

Messages to and from the CC to the RCC will be routed by LGC messaging, allowing RCC basic maintenance to be performed by the CC. Link maintenance of message links will be as with the LCM.

The diagnostic will test features of the 6X72AA formatter card which is used with the RCC. The diagnostic will check for card presence, test the host loop and the control RAM. Loop test may be performed in service. The other tests in active busy and inactive modes.

References:

FDOC BF0247
FDOC BF0249

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	MAINTENANCE AND TESTING
Feature	RSC T1 MAINTENANCE
Feature no	F1358

FEATURE SYNOPSIS

This feature implements C-side DS-1 maintenance in RCS's.

FEATURE DESCRIPTION

In remote peripherals such as the RCC (remote cluster controller), DS-1 circuits are connected to the C-side of the peripheral. This feature allows the following functions to be performed:

- enable/disable monitoring of DS-1 circuit's physical presence
- enable/disable maintenance monitoring of DS-1 circuits
- update status of inactive unit to reflect current state of DS-1
- manipulation of A/B bits through the 6X72 formatter for use by C-side DS-1 diagnostics.

Reference

FDOC BF0246

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	MAINTENANCE AND TESTING
Feature	RSC RMM MAINTENANCE
Feature no	F1360

FEATURE SYNOPSIS

This feature provides the basic support for the RCC RMM.

FEATURE DESCRIPTION

The RMM used with the RSC has one link to the RCC. Each RCC may have 0, 1 or 2 RMM's.

The RMM provides for the scanning of service circuits, dial pulse collection, test trunks alarm circuit packs, etc.

The RMM supports 2 DS-30A ports with a DMSX message channel on channel 0 of these ports. The primary port is used for connecting the RMM to the RSC. Failure of the primary link takes the RMM out of service.

Reference: FDOC BC0716

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	SIGNALING AND SUPERVISION
Feature	RSC SIGNALLING CHANNEL SUPERVISION
Feature no	F1361

FEATURE SYNOPSIS

This feature provides supervision for call processing.

FEATURE DESCRIPTION

In the LTC-RSC-LCM configuration, there is CSM (channel supervision message) hardware located in the LTC. Although the CSM hardware 6X42AA card is not present in the RSC, supervision must still be maintained for call processing and call transparency to the user. This feature ensures the above.

Reference:

FDOC BF0242

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	ADMINISTRATION
Feature	RSC OPERATIONAL MEASUREMENTS
Feature no	F1366

FEATURE SYNOPSIS

To provide support for the operational measurements for the RSC.

FEATURE DESCRIPTION

Operational measurements on PM's are currently kept on an office basis for each PM type. Similarly for the RCC, the following counts will be kept:

1. Errors
2. Fault
3. Inits
4. Reload required
5. Unit system busy usage
6. Unit man busy usage
7. Module system busy usage
8. Module man busy usage
9. Control transfer
10. Emergency control transfer
11. CCTSB - p side link system busy
12. CCTMB - p side link man busy
13. CCTFL - p side link diagnostic fault detect
14. CCTER - p side link unsolicited message

Providing that the optional RCC software is present, the provision of OM measurements is included as a standard function along with other maintenance activity for the RCC.

References: FDOC BV1108

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	MAINTENANCE AND TESTING
Feature	RSC METALIC LINE TESTING
Feature no	F1370

FEATURE SYNOPSIS

Provides ALT (automatic line testing) for RSC lines.

FEATURE DESCRIPTION

This feature supports the integration of the RSC into ALT. No changes are required to support the integration of RSC's into ALT.

Reference

FDOB BC0894

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	MAINTENANCE AND TESTING
Feature	RSC LINE TESTING USING LTU
Feature no	F1371

FEATURE SYNOPSIS

Provides ALT (automatic line testing) for RSC lines.

FEATURE DESCRIPTION

This feature supports the integration of the RSC into ALT. No changes are required to support the integration of RSC's into ALT.

Reference

NTP 297-2101-121

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	MAINTENANCE AND TESTING
Feature	RSC TRUNK WARM SWACT
Feature no	F5767

FEATURE SYNOPSIS

The feature provides the necessary mechanisms for the remote cluster controller (RCC) and the line and trunk controller (LTC) warm SWACT for trunk calls in a remote switching centre (RSC).

Note that a warm SWACT is a mechanism provided for a hardware module to switch activity from one unit to another while maintaining all the calls in the talking state (i.e. stable calls).

FEATURE DESCRIPTION

The feature will maintain stable trunk calls in the RSC when the RCC or LTC SWACT takes place. The switching of activity may occur whenever a serious fault is detected. For example, the ability to communicate with its C-side by the RCC or LTC is lost or a manual request from maintenance personnel is initiated.

i) RCC Warm SWACT:

Existing LTC software mechanism for warm SWACT will be utilized by the RCC software. No major software structural code change was necessary for the RCC warm SWACT application. Major issues addressed for RCC warm SWACT include the enabling/disabling a-b bits transparency in the inactive RCC, the setting up of CSM in the inactive LTC and the starting of the scanner on the LTC C-side.

After an RCC warm SWACT, trunk calls in (stable) talking state are maintained. Any trunk which has not yet synchronized its data in the inactive RCC will be dropped. For any trunk which is stable at one time of an RCC warm SWACT, the trunk will remain in its talking state. Should that trunk require additional supervision, other than going on hook, the trunk (and its call) will be idled.

ii) LTC Warm SWACT:

The mechanism for maintaining the status of trunks on a RCC across an LTC warm SWACT is much the same as that used for lines on an RCC. Only the specific data required will be different for trunks versus lines.

All stable trunks that survive an RCC warm SWACT will also survive an LTC warm SWACT with one exception - those which have not yet been set up in the inactive LTC. Trunks that are not yet stable in the LTC will be brought down by the CC.

Ref:

FDOCs:

BF0963 RSC Trunk Warm SWACT
BF0364 LTC - SWACT Peripheral Enhancement
BF0242 RSC - LTC Line Call Processing

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	ADMINISTRATION
Feature	RCC CSIDE LINK DIAGNOSTIC
Feature no	F6090

FEATURE SYNOPSIS

This feature will integrate diagnostic coverage from the PM MAP for the carrier links from the host LTC to the RCC. This incorporates diagnostics accessible from the carrier level only in BCS20.

FEATURE DESCRIPTION

This feature is designed to enhance the manual testing for p-side DS1 links of XPMs.

TST link command uses a p-side link test to test a link. Similarly, the RTS runs a p-side link test to test a link before returning a link to service. Both TST and RTS commands are entered at PM level of the map. Basically, the p-side link test provides speech test (PLNKDIAG) and message test (message route back) depending on capabilities and conditions of DS1 links.

Speech and message test only run tests on transmitting and receiving part of 6X50 interface card. The result is that the existing p-side DS1 link test does not provide a thorough test on 6X50 card.

This incomplete test may create some problems, for instance, a faulty component (i.e. control/status) of 6X50 card exists and the test can be successful. Another example is without the 6X50 card on LGC shelf (LGC-RCC) the existing TST returns success. These problems will be eliminated in this feature.

This feature invokes the 6X50 card diagnostic which will perform a complete test on 6X50 interface before the speech (PLNKDIAG) and message (message route back) are executed. This enhancement will supply an additional test to both TST and RTS command for a link at PM level.

FDOC AL0096

Package	NTX145AA05 REMOTE SWITCHING CENTER
Feature set	ADMINISTRATION
Feature	RCC C-SIDE NON CONSECUTIVE LINKS
Feature no	F6571

FEATURE SYNOPSIS

This feature provides the capability to configure a larger remote, called a Dual RSC (Remote Switching Center) through Interlink Table Control and Static Data. It allows a craftsperson to datafill an inventory table for Dual RSC and download the necessary static data to the peripherals affected.

FEATURE DESCRIPTION

This feature provides two distinct functions required in order to configure a Dual RSC as follows:

- Table Control
- Static Data

Table Control - This function provides the capability to configure a new Dual RSC or reconfigure an existing Dual RSC. For this purpose a new inventory table called "IRLNKINV" is created to datafill the Interlinks which interconnect the two RCCs to form a Dual RSC.

Static Data - The static data is the information that the CC sends to each RCC of a Dual RSC after it has been configured or reconfigured. This data is required by both RCCs to perform their Dual RSC functions such as inter-calling and interlink maintenance.

Currently, static data to an RCC is sent in the form of a series of tables when it is returned to service (RTS). The same mechanism will be used to download the static data to both RCCs for Dual RSC configuration.

Ref: FDOC - AF0566
FDOC - F6461

NTX146AA03 Status: RTM REMOTE LINE CONCENTRATING MODULE (RLCM)

SWITCHING AND TRANSLATIONS	:	
RLCM BASIC		F1420
MAINTENANCE AND TESTING	:	
RLCM MAINTENANCE		F1423
RLCM FACILITY MAINTENANCE		F1424
RLCM RMM MAINTENANCE		F1426
RLCM-LTC-SPCH PATH DIAG. ENHANCEMENT		F3949

Package	NTX146AA03 REMOTE LINE CONCENTRATING MODULE (RLCM)
Feature set	SWITCHING AND TRANSLATIONS
Feature	RLCM BASIC
Feature no	F1420

FEATURE SYNOPSIS

This feature provides basic support for remoting an LCM as a Remote Line Concentrating Module. The LCM DS-30A ports are mapped onto the equipped DS-1 line cards by the Link Control Card (LCC).

The RLCM consists of an LCM, DS-1 line card and link control cards (one per LCM unit). Optionally an Emergency Stand Alone (ESA) processor and a Remote Maintenance Module (RMM) may be included.

Each of the LCCs provides an interface between an LCM units DS-30A ports (on the Digroup Control Card) and all the RLCM's equipped DS-1 line cards. In normal operation the two LCM units load share with each of the LCCs accessing the even and odd numbered lines respectively. In the event of an LCC failure the mate unit has the capability to handle all the DS-1 lines.

The LCCs also provide the system clocks for the DCC, RMM and DS-1's. Each LCC derives a clock by frequency locking to the primary DS-1 link. The clocks are used in hot standby with both units being driven from the same clock source.

FDOC F0270 should be referenced for detail of the channel mappings.

Package	NTX146AA03 REMOTE LINE CONCENTRATING MODULE (RLCM)
Feature set	MAINTENANCE AND TESTING
Feature	RLCM MAINTENANCE
Feature no	F1423

FEATURE DESCRIPTION

This feature provides RLCM support such as busy, RTS and load actions for the LCM units within the RLCM. Support for the optional modules (RMM and ESA) are provided by F1426 and F1447 respectively.

Package NTX146AA03 REMOTE LINE CONCENTRATING MODULE (RLCM)
 Feature set MAINTENANCE AND TESTING
 Feature RLCM FACILITY MAINTENANCE
 Feature no F1424

FEATURE SYNOPSIS

This feature provides the ability to perform a partial line card diagnostic on an RLCM which does not have a serving RMM. The partial diagnostic will be referred to as the "No LTU Diagnostic". The No LTU Diagnostic will only be supported for the following line cards:

- A 6X17AA Pots Line Card
- E 6X19AA Message Waiting Line Card
- C 6X21AA Electronic Business Set Line Card
- D 6X71AA Data Unit Line Card

<u>DIAGNOSTIC</u>	<u>LINE CARD TYPE</u>		
Loop signalling at line card	C	D	
Transhybrid loss	A	C	E
Test pads in line card	A	C	E
Noise test	A	C	E
Buffer full flag H/L	C	D	
Loop signalling at keyset	C	D	
Terminal equalization test	C		
Ringling and supervision	A		E
Message waiting			E

TABLE 1 "No LTU" Diagnostic Test vs Card Type

Package	NTX146AA03 REMOTE LINE CONCENTRATING MODULE (RLCM)
Feature set	MAINTENANCE AND TESTING
Feature	RLCM RMM MAINTENANCE
Feature no	F1426

FEATURE SYNOPSIS

The Remote Maintenance Module (RMM) is a new remote peripheral may be optionally provided with an RLCM to provide maintenance and service capabilities.

The RMM is a single shelf module consisting of 2 power converters, an RMM control card, a CODEC and TONE card and space for 15 test trunks/service circuit packs. The RMM terminates on DS-30A links on the RLCM LCCs (one on each). The RMM messages to the host LTC or LGC via a message channel on one of the two DS-30A links. This channel is nailed up to a channel on one of the primary DS-1 links to the host peripheral.

The MTM provides support for:

- local line test unit
- metallic test interface
- scan and SD point control
- dial pulse and digitone digit reception
- remote metallic access

Package	NTX146AA03 REMOTE LINE CONCENTRATING MODULE (RLCM)
Feature set	MAINTENANCE AND TESTING
Feature	RLCM-LTC-SPCH PATH DIAG. ENHANCEMENT
Feature no	F3949

FEATURE SYNOPSIS

To create a peripheral p-side diagnostic and to improve the robustness of the existing speech path diagnostic.

FEATURE DESCRIPTION

The following deficiencies in the current speech path diagnostic will be corrected:

a) The diagnostic produces 'No Resources' errors for a number of different reasons. Each such error will now be augmented with an error log entry detailing the resource failure that led to the error.

b) The diagnostic currently tests only two speech channels, and two p-side links. Both the speech channels and the p-side links are chosen at random, leading to unpredictable and inconsistent results. Consistent with the mode of the XPM, all channels, and all p-side loops (or as many as are available to the unit) will be tested.

c) The diagnostic tests only two c-side formatter loop arounds. Consistent with the mode of the XPM, all c-side formatter loop arounds will be tested.

d) The diagnostic is currently unable to detect the removal of, or absence of, a 6X48 circuit pack that should be there. The diagnostic will now check, before each run, that all 6X48's that were data filled are still present. If any boards are missing, the diagnostic will fail.

e) The diagnostic currently performs p-side link testing on LCM (6X48) links only. Only one randomly chosen link is tested. P-side link testing will be extended such that it will be performed on all links, regardless of the remote attached to them. The approach taken will be flexible enough to accomodate many different link/node types.

The current diagnostic will be split into two separate diagnostics. These are:

a) SPCHDIAG: This diagnostic will cover all internal components of the XPM speech path. This involves c-side and p-side looparounds, and the speech bus.

b) PLNKDIAG: This diagnostic will cover p-side link testing for any remote on the p-side of an XPM (note that c-side link testing is already provided by NETDIAG).

The speech path diagnostic will consist of four separate tests. These are detailed below:

a) Hardware presence test: the function of this test is to ensure that the 6X41, 6X43 and 6X44 (formatter, message and timeswitch) cards are present.

b) 6X48 (DS30A) presence test: the function of this test is to ensure that the 6X48 circuit packs that were data filled are still present. Specifically, this test will detect a removed or failed 6X48. The test will terminate following the first detected board.

c) P-side loop test: the function of this test is to check all of the dedicated loop arounds on all of the p-side interface cards available to the XPM unit (6X50's will be excluded when the unit is in an inactive mode). As well, the operation of the hiway mux is checked.

d) Internal loop test: the function of this test is two fold. The major function of this test is to check all the XPM speech channels. In out of service modes, a full test on all channels will be run. If the XPM is in an inservice mode, the test will operate like the current diagnostic, just checking two randomly selected maintenance/ diagnostic channels. A second function of this test is to check the operation of the PCM enable/disable gates.

The p-side links diagnostic will consist of three separate tests. These are detailed below:

a) Hardware presence test: the function of this test is to ensure that the 6X43 and 6X44 (message and timeswitch) cards are present.

b) 6X48 (DS30A) presence test: the function of this test is to ensure that the 6X48 cards that were data filled are still present. This test is identical to the test in the speech path diagnostic.

c) Full peripheral test: the function of this test is to check one channel of each p-side link. This will test all p-side links, regardless of the type of peripheral at the remote end. This test will be run only in active modes (Act/Ins, Act/Busy). The nature of the test run on each link will be determined by the link type and the p-side node type.

NTX147AB01 Status: RTM OUTSIDE PLANT MODULE MAINTENANCE (UPGRADE

MAINTENANCE	:	
OPM SCHEDULED BATTERY ROTATION		F2811
MAINTENANCE AND TESTING	:	
OPM CC MTCE SOFTWARE		F5433

Package	NTX147AB01 OUTSIDE PLANT MODULE MAINTENANCE (UPGRADE OF NTX147
Feature set	MAINTENANCE
Feature	OPM SCHEDULED BATTERY ROTATION
Feature no	F2811

FEATURE SYNOPSIS

This feature enhances the outside plant module power and environmental system by providing modified battery rotation procedures, low voltage alarm and a charge bus diagnostic test.

FEATURE DESCRIPTION

Up to four pairs of battery strings may be provided for OPM backup power. In order to maintain the level of charge, battery strings are rotated on the load bus. This feature provides for battery rotation modes as follows:

1. Normal battery rotation mode.
2. AC failure mode.
3. Post AC failure mode.

The normal battery rotation allows each pair of battery strings to be rotated between charge bus and load bus, each pair of strings remaining on the charge bus for 1 day (24 hours) then returning to the load bus. The next pair which is placed on the charge bus is determined by datafill.

In the case of an AC failure, the normal battery rotation mode is interrupted and all batteries are moved to the load bus. During this period which is called the AC failure mode, the batteries cannot be removed from the load bus.

When AC power is restored the battery rotation enters the POST AC FAILURE MODE which ensures that all batteries remain on the load bus for at least 24 hours (48 max) after AC is restored.

When the post AC failure mode expires without other AC failure, the first equipped battery string pair (usually 0) is moved to the charge bus for 1 day, resuming normal battery rotation mode.

Ref: DDOC BR0811

Package	NTX147AB01 OUTSIDE PLANT MODULE MAINTENANCE (UPGRADE OF NTX147
Feature set	MAINTENANCE AND TESTING
Feature	OPM CC MTCE SOFTWARE
Feature no	F5433

FEATURE SYNOPSIS

OPM specific maintenance functions are implemented. These include the display and control of environmental and power systems for the OPM. Automatic power changing is not implemented.

FEATURE DESCRIPTION

The OPM (outside plant module) is a repackaged RLCM in an environmentally controlled cabinet. Optionally the cabinet may contain an emergency battery backup power supply. This feature consists of the software to control and monitor the power and environment system of the OPM cabinet (OPMPES).

A new table OPMINV is used to handle the information relating the OPM cabinet to the RLCM and battery setup (if any). A new frame type will be added to the types definition to enable OPM identification as OPE. The LCMINV and RMMINV tables are changed to show if RLCM and RMM are in an OPM by the frame type of OPE.

MAP support of OPMPES is provided as follows:

- . Make the maintenance of OPMPES accessible through the PM level of the MAP.

- . The control of switching the battery strings will be by cross points in an MTA (NT3X90AA), activating switching circuits within the OPM BCC (NT8X02AA), and the alarm detection card (NT0X10AA) will be on the RMM.

- . The MAP will continue to display the three system status lines at the top of the screen and the 'PM' status alarm field will show 'PES' in the event one or more OPMPES have a red or amber. This could be overridden by any PM alarm.

- . There is no impact on the call processing or maintenance aspects of the RLCM.

This feature covers:

- 1) The table control for the OPMPES data (OPMINV).

- 2) MAP and maintenance support for the OPMPES, consisting of:

- a) remote control of battery string switching:

- . open circuit, to remove a battery string pair from either the

- load bus or the charge bus.
 - . put a battery string pair onto the load bus
 - . put a battery string pair onto the charge bus
- b) Bsy, Rts, Tst, Offl for the circuits used to control battery string switching and detect alarm/state conditions of an OPMPES.
- 3) Alarm detection and automatic battery switching on certain types of alarms conditions. As a failsafe, craftsperson will be prevented from switching the battery strings when the following conditions are detected:
- . AC failure
 - . BCC fuse 0 or 1 failure
 - . rectifier 0 or 1 failure
 - . extremely high temperature
- 4) Log reports in the LOG system to reflect the changing events or failures encountered in the OPMPES system.
- 5) Hourly audits on the OPMPES for periodic verification of the condition of the OPMPES as viewed in software. If a mismatch between software and hardware is detected then the audit will restore the hardware to the current condition of the software and generate a log message indicating this.
- 6) Displaying the shelves and bay id in the circuit location and the QUERYPM information.
- 7) Make OPMPES circuits visible at TTP level but inaccessible.
- 8) Agency aspects to reflect the state of the RMM in the state of the OPMPES circuits.

Reference

FDOC BC1440

NTX149AA02 Status: RTM RSC EMERGENCY STAND ALONE OPERATION - LI

ESA - RSC	:	
RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BASIC SERVICE		F1378
RSC - ESA TRANSLATION		F1383
TAKE OVER/TAKE BACK		F1384
RSC ESA - AUTO UPDATE OF SUBSCRIBER/TRANSLATION DATA VIA DOW		F1386
RSC - ESA TABLE CONTROL		F1387
ESA-RLCM	:	
RLCM ESA - BASIC PM MAINTENANCELIN		F1447
ESA-RSC	:	
ESA - PREFIX TRANSLATION TABLE CONTROL		F5768
RSC-ESA - STATIC DATA HANDLING IN XPM		F5769
MAINTENANCE	:	
RLCM/RCE ESA CHANNEL CAPACITY INCREASE		F6303

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA - RSC
Feature	RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BAS
Feature no	F1378

FEATURE SYNOPSIS

Emergency stand alone (ESA) occurs whenever the communications between the RSC and the host switch fails. The feature provides line to line call handling in the RSC under ESA situation. It also defines the translation data structure as well as translation operation for line to line calls. The ESA central control is a software module residing in the MASTER PROCESSOR (MP) and emulates the host central control (CC). The feature includes a mechanism to collect static data in the host CC and download the data to the RSC.

Under normal condition when RSC is controlled by the host, call translations are performed in the host CC. During ESA, only basic calls are supported. No special line features are allowed.

FEATURE DESCRIPTION

The feature provides line to line call processing in a remote switching centre (RSC) when it enters into ESA mode of operation. It also defines translation data structure, its operations and deals with the bulk data downloading from the host CC.

The ESA CC software runs as a state machine driven by events (input messages). Data concerning translation and subscribers in the RSC are obtained from the CC in the host switch. The ESA translation data is composed and sent down by the CC. This bulk data downloading occurs periodically and when the RSC is returned to service. Any table control changes will not be updated in the RSC immediately. Therefore, a manual downloading request is required if desired, to ensure the data is up to date. Other data which are dynamic during the life of the call processing are also required. This confines mainly to two data structure areas. These are:

i) Unprotected Line Data - refers to the terminal status table. The table is used by the ESA CC to decide what action to take when a line generates an error during call process. An error count is kept and if the count reaches a preset threshold, the line is put out of service. Its cause of error is recorded. In addition, the table provides a call process block (CPB) index/origination count data field. If resource is unavailable during origination, this field stores the number of re-origination attempts. It also stores the index to the CPB after the origination phase.

ii) Dynamically Allocated Data Block - refers to the ESA call process blocks (CPB). As it's name implies, this is the call processing related

data base associated to a call in progress. Since the number of calls the ESA can support is much lower than the number of lines RSC supports, the number of CPBs allocated is therefore only half the maximum number of intra-switch channels available (i.e., 240).

All calls in the ESA mode are intra-switched and an intra-switched channel is required to complete a call. If for some reasons this channel is unavailable, the ESA CC will be informed and the originator is given a reorder tone. Lines that are busied out due to repeated errors such as too many originations, translation error, digit receive error etc., are returned to service by the line audit process after a specific period of time. This will ensure that lines suffered a transient fault are not denied of service indefinitely.

While in ESA, the ESA software keeps a count of various operational measurements. These measurements include traffic peg counts (e.g., origination/termination attempts, call completed etc) and error peg count (e.g. ringing failure, coin failure etc). Note that when RSC exits from ESA, all peg counts can be retrieved by the CC.

References:

FDOCs:

BF0256 RSC-RCC Line Intra-switching
BF0254 RSC-RCC ESA Line Call Processing
BF0614 RSC-ESA Translation
BF0615 RSC-ESA Static Data Handling

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA - RSC
Feature	RSC - ESA TRANSLATION
Feature no	F1383

FEATURE SYNOPSIS

This feature provides translation facilities for the remote switching centre (RSC) during emergency stand-alone (ESA) line to line call operations. It deals with the data structure of the translation data and the actual translation operations for line to line calls.

FEATURE DESCRIPTION

The RSC is normally under the control of the host and the translation is performed in the host central control (CC). During ESA the RSC acts upon a set of ESA translation data which is composed and sent down by the host CC periodically or when the RSC is returned to service. The ESA translation data is basically a subset of the host CC translation data sufficient to support ESA operation environment where only basic service calls are supported.

Translation data base for ESA operation consists of the terminal data table, AUL data table, customer group table, prefix table, prefix header table, extension prefix table, extension prefix header table, digit translation tables, hunt group header table, hunt group table and office parameter table. The tables contain the line data and directory number data for origination and termination set up respectively.

When the ESA CC receives an origination message, it checks the valid terminal number and terminal type for the line concerned. The message buffer index is then written into the call process block (CPB). A procedure call for the line translation is invoked. It checks the message type in the message buffer. As soon as the ESA CC receives the digits message or the last digit message, the procedure performs digit translation to obtain a terminator. It copies the digits from the message buffer to the CPB digit register and attempts to translate the collected digits. Translation result is written into the CPB. When a terminator is obtained, the ESA CC is then in a position to set up the call.

References:

FDOCs:

BF0495 RLCM ESA Table Control
BF0494 RLCM ESA Translation
BF0254 RSC ESA Call Control
BF0615 RSC ESA Table Control
BF0940 RSC ESA Static Data Handling in XPM

BF0614 RSC ESA Translation

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA - RSC
Feature	TAKE OVER/TAKE BACK
Feature no	F1384

FEATURE SYNOPSIS

This feature facilitates the entry to and exit from ESA (Emergency stand alone) mode of operation in the remote switching centre (RSC). At present only the 'cold' ENTER/EXIT operation is implemented. This means that intra-switched calls in a stable talking phase also will not survive the transition in the RSC (i.e. all calls are dropped).

FEATURE DESCRIPTION

When the RCC (remote cluster controller) C-side communication is lost, the RCC enters the ESA mode of operation. The ESA central control software takes over the call processing responsibility. When the RCC host communication is restored, the RCC exits ESA mode under the control of the host CC. The CC takes back the call processing responsibility.

There are two ESA ENTER/EXIT options. They are referred to as 'warm' and 'cold' ENTER/EXIT. For warm transition, all intra-switched calls in stable talking phase are preserved, the rest will be dropped. For cold, all calls are dropped in the transition.

i) RCC-ESA ENTER:

RCC-ESA ENTER is triggered if the loop-around message audit has detected the loss of communication of the host CC or the XPM maintenance software in conjunction with the DS-1 maintenance discover that both RCC units have broken the DS-1 message links to the host CC. Timeout controls are provided in both cases and their timeout values are settable as office parameters.

Loop around message audit failure timeout is implemented to prevent a peripheral module from entering ESA while its C-side module (e.g. host CC) is performing a restart. While DS-1 link failure timeout is to protect the possibility of bouncing link. The RCC remains in its running state during the timeout period. The state of the links are checked by the RCC when timeout matures. If the fault persists, ESA is entered.

ii) RCC-ESA EXIT:

When the host DS-1 message links and C-side communications are restored, host CC will initiate the ESA-EXIT sequence. Timeout as an office parameter is also implemented in the ESA-EXIT sequence to guard against bouncing links. There are two possible EXIT situations:

- System EXIT: it is an automatic exit from ESA invoked by the CC if the RCC is not in the ManB state or the exit time-out is non-zero.

- Manual EXIT: this involves craftsperson interventions during the exit process if the time-out parameter is set to zero or when the RCC unit is in the ManB state.

Since the default value of the time-out parameter is zero, manual EXIT is the default exit procedure. This means that after the communication to the host is re-established, the CC does not return RCC to service and RCC remains running in ESA until RTS command is issued via the MAP. This feature allows the craftsperson to delay the ESA exit if there are a large number of calls currently in active on the unit. Appropriate displays will be output on the MAP in all cases.

References:

FDOCs:

BF0616 RSC-ESA Entry and Exit
BF0254 RXC-RCC ESA Call Processing
BF0614 RSC-ESA Translation
BF0266 RLCM-ESA Basic PM Maintenance
BF0267 RLCM-LTC PM Mtc
BF0497 RLCM-ESA ENTER/EXIT

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA - RSC
Feature	RSC ESA - AUTO UPDATE OF SUBSCRIBER/TRANSLATION DA
Feature no	F1386

FEATURE SYNOPSIS

The feature provides the central control (CC) resident maintenance support for Emergency Stand Alone (ESA) in the remote cluster controller (RCC) of the remote switching centre (RSC). This feature only supports 'cold' exit from ESA mode of operation. This means that all calls will be lost during the exit from ESA.

FEATURE DESCRIPTION

This feature provides the following CC maintenance support for ESA mode of operation in the RSC.

Office Data Management:

For ESA maintenance usage, data is required to be added to the office parameter table RCCINV. These data parameters include those to support RSC ESA entry/exit delays, RSC ESA static data updating time and RSC ESA static data update boolean.

Note that the ESA feature in RSC is provisioned on a per office basis. If the CC load has the ESA packages equipped, then all the RSCs in the office will have the ESA capability.

MAP Commands/Display:

RCC commands such as RTS, query PM and load PM are available to serve for the control of the ESA functions in the RCC. Display of these functions on the MAP VDU is provided.

Node/Link States:

The RCC node/unit states are the same as a non-ESA RCC and there is no new indication when the RCC is running in ESA node. This has to be assumed from the link failure. However, these will be confirmed (e.g. by an ESA-OM log message after ESA exited) that the RCC was running in ESA when the RCC is recovered.

Loading of ESA Static Data:

A failure in downloading of the ESA static data will trigger a log message output giving the table id that failed and a text string describing the table. No attempt to load the rest of the table will be made.

ESA Entry and Exit:

The RSC will control entry into ESA. However, ESA exit will be controlled by the CC unless datafill indicates that manual intervention is required. Entry time-out is incorporated to guard against bouncing link(s). In order to allow the restored links to stabilize before they are used, an exit time-out is also built in. Manual exit from ESA is possible with no ESA time out required.

Audits:

Status information in the audit message from the peripheral (RCC) will inform the CC if it is running in an ESA mode. This is checked for the in service RCC in ensure that it has not entered ESA in error. If it has then the node will be busied and returned to service.

Automatic Nightly Updating of Static Data:

Changes to the line and trunk data are not forwarded to the RCC ESA control software as they are made. Instead, the system will update the ESA static data in all RCCs at a specified time of day (e.g. 2 am) where traffic is low. The data is sent to each in service RCC in sequence, one at a time.

SWACT:

When communication between the RSC and the host CC fails, a number of possible actions can be taken by the RCC. These are SWACT, entering ESA etc. See Ref. 1 for further details.

References:

FDOCs:

BF0247 RSC-RCC Basic Mtc
BF0256 RCC-ESA Call Processing
BV0975 ESA Mtc for 3000 Line Remote
BF0615 RSC-ESA Static Data Handling
BF0616 RSC-ESA Entry and Exit

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA - RSC
Feature	RSC - ESA TABLE CONTROL
Feature no	F1387

FEATURE SYNOPSIS

This feature provides a mechanism to collect static data in the CC and download the data to the RSC. The static data is primarily translation data required by ESA call processing but some non-translation data are also included.

The feature can be activated by a MAP command, periodically (daily) updates or when RSC is returned to service where RSC does not already contain the valid data.

FEATURE DESCRIPTION

The bulk of the work in this feature is the collection of translation data. This required scanning and collecting the current data needed by the RSC-ESA translation in the host CC for each line in the RSC.

The collection of the data in the CC is done by scanning each terminal sequentially and fills the appropriate tables with the relevant data. Overflow during data collection may occur whenever the table size is exceeded. In all overflow cases a log message will be produced identifying the table concerned and issuing a warning that call processing for some lines will be affected. For example, if automatic line (AUL) table overflows all extra AULs will automatically dial 0. Any customer group processed after the limit of the customer table has been reached will have its lines treated as POTS lines.

This feature is also responsible for sending the static data to the RSC. The downloading of this RSC-ESA translation data uses the standard method of loading XPM static data. This requires that message buffers be loaded with data entries for each table until it has been completely downloaded.

References:

FDOCs:

BF0615 RSC ESA Static Data Collection & Downloading to RCC
BV0975 ESA Mtc for 3000 Line Remote
BF0940 ESA Static Data Handling in XPM
BF0254 RSC-RCC ESA Call Processing

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA-RLCM
Feature	RLCM ESA - BASIC PM MAINTENANCE LIN
Feature no	F1447

FEATURE SYNOPSIS

This feature provides basic PM maintenance for the remote line controller module (RLCM) during emergency stand-alone (ESA) mode which includes error/trap recovery and general audits.

FEATURE DESCRIPTION

The ESA maintenance package provides the RSC with basic maintenance supervision and integrity control. The main issues which are considered in the maintenance of the RSC while in ESA are:

- handling host (CC) bound messages from RSC software. This includes call processing messages from the LCM's and maintenance reports from the software resident in the RCC (Remote Cluster Controller).
- maintaining ESA state over hardware or software failure in one unit of the RSC.
- handling ESA entry and exit transitions.

References:

FDOC BF0266

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA-RSC
Feature	ESA - PREFIX TRANSLATION TABLE CONTROL
Feature no	F5768

FEATURE SYNOPSIS

This feature provides the ESA prefix translation table (ESAPXLA) which defines the prefix translation data used for POTS and IBN customer groups for RLCM/RSC operating in stand alone mode. Modification to the customer header table (CUSTHEAD) are also made so that an ESA prefix translator may be associated with an IBN customer group.

FEATURE DESCRIPTION

The feature provides the ESA prefix translation table to translate special dialing sequences and to give them special attention. The prefix table entries have a three part key; a ESA prefix translator name, node number and an entry number. The translator name is a unique identifier not used for any other table. Each customer group is assigned a prefix translator name if they are to receive prefix treatment in ESA. There can be several nodes for each prefix translator name. The number of nodes can vary from 1 to 4095. Entries per translator name/node pair can also be up to 4095. The data structure was designed with this flexibility and be memory efficient.

By using linked lists for table control, the data structure provided flexibility. Each customer can define many prefix translators for ESA. It also means that the customer groups are not limited to occupy a preset number of nodes.

The feature also provides a new option in the customer header table to link information in the prefix tables to a particular customer group. The option specifies the prefix translation table name that should be used for that customer group. Since it is possible to have the customer groups spread over different remotes, a prefix translation name can have data for more than one node. It is also allowed to have more than one customer group sharing a prefix translator name. The prefix name will be associated when datafield options is assigned to the customer group in table CUSTHEAD.

Ref: FDOCs:

BC2087 ESA-Prefix Translation Table Control
BF0615 RSC-ESA Static Data Handling

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	ESA-RSC
Feature	RSC-ESA - STATIC DATA HANDLING IN XPM
Feature no	F5769

FEATURE SYNOPSIS

This feature provides the reception of static data tables from the CC necessary for ESA translation and call processing in the RLCM/ RSC. The feature also provides storage allocation for these tables and auditing procedure for checking the validity of the data received.

FEATURE DESCRIPTION

The emergency stand alone (ESA) state in the RLCM/RSC is entered when the communication with the host CC is not possible. This feature enables the reception of the ESA static data from the CC. The data is necessary for the RLCM/RSC to provide call processing functions (see Ref 1). The data required for ESA call processing is mainly the translation tables which are used to attempt a termination for the digits received. The CC periodically collects ESA static data for the RLCM/RSC and transmits portions of the tables to the RLCM/RSC via messages until all tables have been completely received.

i) Memory Allocation:

A table reset message is sent to the RLCM/RSC when CC has finished collecting all the ESA static data. The message serves as a notification to reset all tables in preparation for the reception of new tables. The memory for the old tables is deallocated since the new table may be of different sizes. New memory is then allocated based on the size of the tables.

Note that in practice, the size of the header table is only sent and not the size of the individual tables which are sent in the messages containing the actual header tables.

ii) Validity of Data:

The CC queries the XPM on the validity of the ESA static data by a data checking procedure call. The procedure checks for NIL table pointers or for incorrect number of entries being sent to the XPM.

An invalidity or non-existence of ESA static data in the XPM will trigger CC to collect ESA static data and starts the data downloading process.

After the completion of data downloading, the CC again queries the XPM on the validity of the ESA static data. An invalid result means that the loading of ESA static data has failed.

References:

FDOCS:

1. BF0254 RSC-ESA Call Control
2. BF0615 RSC-ESA Table Control
3. BF0614 RSC-ESA Translation
4. BF0940 RSC-ESA Static Data Handling in XPM

Package	NTX149AA02 RSC EMERGENCY STAND ALONE OPERATION - LINES
Feature set	MAINTENANCE
Feature	RLCM/RCE ESA CHANNEL CAPACITY INCREASE
Feature no	F6303

FEATURE SYNOPSIS

This feature allows all RLCM or RCC intra channels to be used under ESA call processing.

FEATURE DESCRIPTION

Under ESA conditions intra as well as inter channels are used to make call connections. This increases the number of intra channels available under ESA for both the RSC and RLCM. The call capacity under ESA will therefore increase proportionately.

Ref: DDOC AG0344

NTX149AB02 Status: RTM RSC ESA OPERATION - LINE AND TRUNK

ESA - RSC	:	
RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BASIC SERVICE		F1378
TRUNKS - ESA	:	
RSC - ESA TRUNK CALL PROCESSING		F1382
ESA - RSC	:	
RSC - ESA TRANSLATION		F1383
TAKE OVER/TAKE BACK		F1384
RSC ESA - AUTO UPDATE OF SUBSCRIBER/TRANSLATION DATA VIA DOW		F1386
RSC - ESA TABLE CONTROL		F1387
ESA-RLCM	:	
RLCM ESA - BASIC PM MAINTENANCE LIN		F1447
ESA-RSC	:	
ESA - PREFIX TRANSLATION TABLE CONTROL		F5768
RSC-ESA - STATIC DATA HANDLING IN XPM		F5769
TRUNKS - ESA	:	
RSC - TRUNK INTEGRATION		F5894
ESARSC	:	
RSC ESA TRUNK TRANSLATION		F6042
MAINTENANCE	:	
RLCM/RCE ESA CHANNEL CAPACITY INCREASE		F6303
ESA - RCC	:	
RSC - ESA TRANSLATION VERIFICATION DOCUMENTATION		F6344

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA - RSC
Feature	RSC EMER. STAND ALONE OPERATION-POTS SUBSCRIB. BAS
Feature no	F1378

FEATURE SYNOPSIS

Emergency stand alone (ESA) occurs whenever the communications between the RSC and the host switch fails. The feature provides line to line call handling in the RSC under ESA situation. It also defines the translation data structure as well as translation operation for line to line calls. The ESA central control is a software module residing in the MASTER PROCESSOR (MP) and emulates the host central control (CC). The feature includes a mechanism to collect static data in the host CC and download the data to the RSC.

Under normal condition when RSC is controlled by the host, call translations are performed in the host CC. During ESA, only basic calls are supported. No special line features are allowed.

FEATURE DESCRIPTION

The feature provides line to line call processing in a remote switching centre (RSC) when it enters into ESA mode of operation. It also defines translation data structure, its operations and deals with the bulk data downloading from the host CC.

The ESA CC software runs as a state machine driven by events (input messages). Data concerning translation and subscribers in the RSC are obtained from the CC in the host switch. The ESA translation data is composed and sent down by the CC. This bulk data downloading occurs periodically and when the RSC is returned to service. Any table control changes will not be updated in the RSC immediately. Therefore, a manual downloading request is required if desired, to ensure the data is up to date. Other data which are dynamic during the life of the call processing are also required. This confines mainly to two data structure areas. These are:

i) Unprotected Line Data - refers to the terminal status table. The table is used by the ESA CC to decide what action to take when a line generates an error during call process. An error count is kept and if the count reaches a preset threshold, the line is put out of service. Its cause of error is recorded. In addition, the table provides a call process block (CPB) index/origination count data field. If resource is unavailable during origination, this field stores the number of re-origination attempts. It also stores the index to the CPB after the origination phase.

ii) Dynamically Allocated Data Block - refers to the ESA call process blocks (CPB). As it's name implies, this is the call processing related

data base associated to a call in progress. Since the number of calls the ESA can support is much lower than the number of lines RSC supports, the number of CPBs allocated is therefore only half the maximum number of intra-switch channels available (i.e., 240).

All calls in the ESA mode are intra-switched and an intra-switched channel is required to complete a call. If for some reasons this channel is unavailable, the ESA CC will be informed and the originator is given a reorder tone. Lines that are busied out due to repeated errors such as too many originations, translation error, digit receive error etc., are returned to service by the line audit process after a specific period of time. This will ensure that lines suffered a transient fault are not denied of service indefinitely.

While in ESA, the ESA software keeps a count of various operational measurements. These measurements include traffic peg counts (e.g., origination/termination attempts, call completed etc) and error peg count (e.g. ringing failure, coin failure etc). Note that when RSC exits from ESA, all peg counts can be retrieved by the CC.

References:

FDOCs:

BF0256 RSC-RCC Line Intra-switching
BF0254 RSC-RCC ESA Line Call Processing
BF0614 RSC-ESA Translation
BF0615 RSC-ESA Static Data Handling

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	TRUNKS - ESA
Feature	RSC - ESA TRUNK CALL PROCESSING
Feature no	F1382

FEATURE SYNOPSIS

This feature provides 1) modifications to the RCC call processing to enable certain types of trunk calls to be supported in Emergency Standalone (ESA).

2) The capability for the CC to collect and download the static data necessary for RSC ESA trunk call processing. It also deals with the reception of the data in the RSC and insertion into the appropriate tables.

3) Provides the translation facilities required within the RSC to support line to trunk, trunk to trunk and trunk to line call processing during emergency standalone (ESA) operation.

FEATURE DESCRIPTION

This feature 1) introduces call processing to support trunk calls when the RSC is in ESA mode. Implementation is achieved by modifying the call processing block to incorporate the requirements of trunk terminations and by altering call processing code to include a new set of supervisory templates pertinent to trunk calls.

2) To support trunk call processing under ESA conditions, data pertinent to the trunk lines terminated on the RSC must be present in the remote cluster controller (RCC) memory. This feature allows the CC to gather a subset of the static data for ESA supported trunks on a given RSC and forward it for initialising/updating purposes to the RSC. The RSC resets its data store in preparation for receipt of the new information.

3) This feature introduces modifications to the prefix translator tables in the remote cluster controller (RCC) to allow trunk operation during ESA.

A new table is introduced to allow access to outgoing trunks resident on the RSC. Also a new procedure is introduced to enable a degree of received digit manipulation on incoming trunks to facilitate further call processing when the RSC is in ESA mode.

Ref: DDOC BF0532

Ref: DDOC 0055

Ref: DDOC AC0057

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA - RSC
Feature	RSC - ESA TRANSLATION
Feature no	F1383

FEATURE SYNOPSIS

This feature provides translation facilities for the remote switching centre (RSC) during emergency stand-alone (ESA) line to line call operations. It deals with the data structure of the translation data and the actual translation operations for line to line calls.

FEATURE DESCRIPTION

The RSC is normally under the control of the host and the translation is performed in the host central control (CC). During ESA the RSC acts upon a set of ESA translation data which is composed and sent down by the host CC periodically or when the RSC is returned to service. The ESA translation data is basically a subset of the host CC translation data sufficient to support ESA operation environment where only basic service calls are supported.

Translation data base for ESA operation consists of the terminal data table, AUL data table, customer group table, prefix table, prefix header table, extension prefix table, extension prefix header table, digit translation tables, hunt group header table, hunt group table and office parameter table. The tables contain the line data and directory number data for origination and termination set up respectively.

When the ESA CC receives an origination message, it checks the valid terminal number and terminal type for the line concerned. The message buffer index is then written into the call process block (CPB). A procedure call for the line translation is invoked. It checks the message type in the message buffer. As soon as the ESA CC receives the digits message or the last digit message, the procedure performs digit translation to obtain a terminator. It copies the digits from the message buffer to the CPB digit register and attempts to translate the collected digits. Translation result is written into the CPB. When a terminator is obtained, the ESA CC is then in a position to set up the call.

References:

FDOCs:

BF0495 RLCM ESA Table Control
BF0494 RLCM ESA Translation
BF0254 RSC ESA Call Control
BF0615 RSC ESA Table Control
BF0940 RSC ESA Static Data Handling in XPM

BF0614 RSC ESA Translation

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA - RSC
Feature	TAKE OVER/TAKE BACK
Feature no	F1384

FEATURE SYNOPSIS

This feature facilitates the entry to and exit from ESA (Emergency stand alone) mode of operation in the remote switching centre (RSC). At present only the 'cold' ENTER/EXIT operation is implemented. This means that intra-switched calls in a stable talking phase also will not survive the transition in the RSC (i.e. all calls are dropped).

FEATURE DESCRIPTION

When the RCC (remote cluster controller) C-side communication is lost, the RCC enters the ESA mode of operation. The ESA central control software takes over the call processing responsibility. When the RCC host communication is restored, the RCC exits ESA mode under the control of the host CC. The CC takes back the call processing responsibility.

There are two ESA ENTER/EXIT options. They are referred to as 'warm' and 'cold' ENTER/EXIT. For warm transition, all intra-switched calls in stable talking phase are preserved, the rest will be dropped. For cold, all calls are dropped in the transition.

i) RCC-ESA ENTER:

RCC-ESA ENTER is triggered if the loop-around message audit has detected the loss of communication of the host CC or the XPM maintenance software in conjunction with the DS-1 maintenance discover that both RCC units have broken the DS-1 message links to the host CC. Timeout controls are provided in both cases and their timeout values are settable as office parameters.

Loop around message audit failure timeout is implemented to prevent a peripheral module from entering ESA while its C-side module (e.g. host CC) is performing a restart. While DS-1 link failure timeout is to protect the possibility of bouncing link. The RCC remains in its running state during the timeout period. The state of the links are checked by the RCC when timeout matures. If the fault persists, ESA is entered.

ii) RCC-ESA EXIT:

When the host DS-1 message links and C-side communications are restored, host CC will initiate the ESA-EXIT sequence. Timeout as an office parameter is also implemented in the ESA-EXIT sequence to guard against bouncing links. There are two possible EXIT situations:

- System EXIT: it is an automatic exit from ESA invoked by the CC if the RCC is not in the ManB state or the exit time-out is non-zero.

- Manual EXIT: this involves craftsperson interventions during the exit process if the time-out parameter is set to zero or when the RCC unit is in the ManB state.

Since the default value of the time-out parameter is zero, manual EXIT is the default exit procedure. This means that after the communication to the host is re-established, the CC does not return RCC to service and RCC remains running in ESA until RTS command is issued via the MAP. This feature allows the craftsperson to delay the ESA exit if there are a large number of calls currently in active on the unit. Appropriate displays will be output on the MAP in all cases.

References:

FDOCs:

BF0616 RSC-ESA Entry and Exit
BF0254 RXC-RCC ESA Call Processing
BF0614 RSC-ESA Translation
BF0266 RLCM-ESA Basic PM Maintenance
BF0267 RLCM-LTC PM Mtc
BF0497 RLCM-ESA ENTER/EXIT

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA - RSC
Feature	RSC ESA - AUTO UPDATE OF SUBSCRIBER/TRANSLATION DA
Feature no	F1386

FEATURE SYNOPSIS

The feature provides the central control (CC) resident maintenance support for Emergency Stand Alone (ESA) in the remote cluster controller (RCC) of the remote switching centre (RSC). This feature only supports 'cold' exit from ESA mode of operation. This means that all calls will be lost during the exit from ESA.

FEATURE DESCRIPTION

This feature provides the following CC maintenance support for ESA mode of operation in the RSC.

Office Data Management:

For ESA maintenance usage, data is required to be added to the office parameter table RCCINV. These data parameters include those to support RSC ESA entry/exit delays, RSC ESA static data updating time and RSC ESA static data update boolean.

Note that the ESA feature in RSC is provisioned on a per office basis. If the CC load has the ESA packages equipped, then all the RSCs in the office will have the ESA capability.

MAP Commands/Display:

RCC commands such as RTS, query PM and load PM are available to serve for the control of the ESA functions in the RCC. Display of these functions on the MAP VDU is provided.

Node/Link States:

The RCC node/unit states are the same as a non-ESA RCC and there is no new indication when the RCC is running in ESA node. This has to be assumed from the link failure. However, these will be confirmed (e.g. by an ESA-OM log message after ESA exited) that the RCC was running in ESA when the RCC is recovered.

Loading of ESA Static Data:

A failure in downloading of the ESA static data will trigger a log message output giving the table id that failed and a text string describing the table. No attempt to load the rest of the table will be made.

ESA Entry and Exit:

The RSC will control entry into ESA. However, ESA exit will be controlled by the CC unless datafill indicates that manual intervention is required. Entry time-out is incorporated to guard against bouncing link(s). In order to allow the restored links to stabilize before they are used, an exit time-out is also built in. Manual exit from ESA is possible with no ESA time out required.

Audits:

Status information in the audit message from the peripheral (RCC) will inform the CC if it is running in an ESA mode. This is checked for the in service RCC in ensure that it has not entered ESA in error. If it has then the node will be busied and returned to service.

Automatic Nightly Updating of Static Data:

Changes to the line and trunk data are not forwarded to the RCC ESA control software as they are made. Instead, the system will update the ESA static data in all RCCs at a specified time of day (e.g. 2 am) where traffic is low. The data is sent to each in service RCC in sequence, one at a time.

SWACT:

When communication between the RSC and the host CC fails, a number of possible actions can be taken by the RCC. These are SWACT, entering ESA etc. See Ref. 1 for further details.

References:

FDOCs:

BF0247 RSC-RCC Basic Mtc
BF0256 RCC-ESA Call Processing
BV0975 ESA Mtc for 3000 Line Remote
BF0615 RSC-ESA Static Data Handling
BF0616 RSC-ESA Entry and Exit

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA - RSC
Feature	RSC - ESA TABLE CONTROL
Feature no	F1387

FEATURE SYNOPSIS

This feature provides a mechanism to collect static data in the CC and download the data to the RSC. The static data is primarily translation data required by ESA call processing but some non-translation data are also included.

The feature can be activated by a MAP command, periodically (daily) updates or when RSC is returned to service where RSC does not already contain the valid data.

FEATURE DESCRIPTION

The bulk of the work in this feature is the collection of translation data. This required scanning and collecting the current data needed by the RSC-ESA translation in the host CC for each line in the RSC.

The collection of the data in the CC is done by scanning each terminal sequentially and fills the appropriate tables with the relevant data. Overflow during data collection may occur whenever the table size is exceeded. In all overflow cases a log message will be produced identifying the table concerned and issuing a warning that call processing for some lines will be affected. For example, if automatic line (AUL) table overflows all extra AULs will automatically dial 0. Any customer group processed after the limit of the customer table has been reached will have its lines treated as POTS lines.

This feature is also responsible for sending the static data to the RSC. The downloading of this RSC-ESA translation data uses the standard method of loading XPM static data. This requires that message buffers be loaded with data entries for each table until it has been completely downloaded.

References:

FDOCs:

BF0615 RSC ESA Static Data Collection & Downloading to RCC
BV0975 ESA Mtc for 3000 Line Remote
BF0940 ESA Static Data Handling in XPM
BF0254 RSC-RCC ESA Call Processing

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA-RLCM
Feature	RLCM ESA - BASIC PM MAINTENANCE LIN
Feature no	F1447

FEATURE SYNOPSIS

This feature provides basic PM maintenance for the remote line controller module (RLCM) during emergency stand-alone (ESA) mode which includes error/trap recovery and general audits.

FEATURE DESCRIPTION

The ESA maintenance package provides the RSC with basic maintenance supervision and integrity control. The main issues which are considered in the maintenance of the RSC while in ESA are:

- handling host (CC) bound messages from RSC software. This includes call processing messages from the LCM's and maintenance reports from the software resident in the RCC (Remote Cluster Controller).
- maintaining ESA state over hardware or software failure in one unit of the RSC.
- handling ESA entry and exit transitions.

References:

FDOC BF0266

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA-RSC
Feature	ESA - PREFIX TRANSLATION TABLE CONTROL
Feature no	F5768

FEATURE SYNOPSIS

This feature provides the ESA prefix translation table (ESAPXLA) which defines the prefix translation data used for POTS and IBN customer groups for RLCM/RSC operating in stand alone mode. Modification to the customer header table (CUSTHEAD) are also made so that an ESA prefix translator may be associated with an IBN customer group.

FEATURE DESCRIPTION

The feature provides the ESA prefix translation table to translate special dialing sequences and to give them special attention. The prefix table entries have a three part key; a ESA prefix translator name, node number and an entry number. The translator name is a unique identifier not used for any other table. Each customer group is assigned a prefix translator name if they are to receive prefix treatment in ESA. There can be several nodes for each prefix translator name. The number of nodes can vary from 1 to 4095. Entries per translator name/node pair can also be up to 4095. The data structure was designed with this flexibility and be memory efficient.

By using linked lists for table control, the data structure provided flexibility. Each customer can define many prefix translators for ESA. It also means that the customer groups are not limited to occupy a preset number of nodes.

The feature also provides a new option in the customer header table to link information in the prefix tables to a particular customer group. The option specifies the prefix translation table name that should be used for that customer group. Since it is possible to have the customer groups spread over different remotes, a prefix translation name can have data for more than one node. It is also allowed to have more than one customer group sharing a prefix translator name. The prefix name will be associated when datafield options is assigned to the customer group in table CUSTHEAD.

Ref: FDOCs:

BC2087 ESA-Prefix Translation Table Control
BF0615 RSC-ESA Static Data Handling

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA-RSC
Feature	RSC-ESA - STATIC DATA HANDLING IN XPM
Feature no	F5769

FEATURE SYNOPSIS

This feature provides the reception of static data tables from the CC necessary for ESA translation and call processing in the RLCM/ RSC. The feature also provides storage allocation for these tables and auditing procedure for checking the validity of the data received.

FEATURE DESCRIPTION

The emergency stand alone (ESA) state in the RLCM/RSC is entered when the communication with the host CC is not possible. This feature enables the reception of the ESA static data from the CC. The data is necessary for the RLCM/RSC to provide call processing functions (see Ref 1). The data required for ESA call processing is mainly the translation tables which are used to attempt a termination for the digits received. The CC periodically collects ESA static data for the RLCM/RSC and transmits portions of the tables to the RLCM/RSC via messages until all tables have been completely received.

i) Memory Allocation:

A table reset message is sent to the RLCM/RSC when CC has finished collecting all the ESA static data. The message serves as a notification to reset all tables in preparation for the reception of new tables. The memory for the old tables is deallocated since the new table may be of different sizes. New memory is then allocated based on the size of the tables.

Note that in practice, the size of the header table is only sent and not the size of the individual tables which are sent in the messages containing the actual header tables.

ii) Validity of Data:

The CC queries the XPM on the validity of the ESA static data by a data checking procedure call. The procedure checks for NIL table pointers or for incorrect number of entries being sent to the XPM.

An invalidity or non-existence of ESA static data in the XPM will trigger CC to collect ESA static data and starts the data downloading process.

After the completion of data downloading, the CC again queries the XPM on the validity of the ESA static data. An invalid result means that the loading of ESA static data has failed.

References:

FDOCS:

1. BF0254 RSC-ESA Call Control
2. BF0615 RSC-ESA Table Control
3. BF0614 RSC-ESA Translation
4. BF0940 RSC-ESA Static Data Handling in XPM

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	TRUNKS - ESA
Feature	RSC - TRUNK INTEGRATION
Feature no	F5894

FEATURE SYNOPSIS

This feature is the test gate for RSC trunking and is created for integration testing of all RSC trunking features.

Ref: DDOC AC0056

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	MAINTENANCE
Feature	RLCM/RCE ESA CHANNEL CAPACITY INCREASE
Feature no	F6303

FEATURE SYNOPSIS

This feature allows all RLCM or RCC intra channels to be used under ESA call processing.

FEATURE DESCRIPTION

Under ESA conditions intra as well as inter channels are used to make call connections. This increases the number of intra channels available under ESA for both the RSC and RLCM. The call capacity under ESA will therefore increase proportionately.

Ref: DDOC AG0344

Package	NTX149AB02 RSC ESA OPERATION - LINE AND TRUNK
Feature set	ESA - RCC
Feature	RSC - ESA TRANSLATION VERIFICATION DOCUMENTATION
Feature no	F6344

FEATURE SYNOPSIS

This is a documentation feature. The RSC emergency standalone translation verification facility is documented.

Ref: DDOC AG0374

NTX150AA03

Status: RTM RSC - INTRA RSC CALLING

RSC INTRA CALL	:	
RSC INTRA SWITCHING LINES		F1388
RSC - INTRA SWITCHING		F1390
ADMINISTRATION	:	
INTRASWITCHING OMS		F3820
RSC INTRA CALL	:	
RSC - INTRA SWITCHING OMS		F5508
TRUNKING	:	
RSC INTRASWITCHED END TO END SIGNALLING		F5938
RSC INTRA CALL	:	
RCC LINE INTRASWITCHING PADS		F6285

Package	NTX150AA03 RSC - INTRA RSC CALLING
Feature set	RSC INTRA CALL
Feature	RSC INTRA SWITCHING LINES
Feature no	F1388

FEATURE SYNOPSIS

Provides intra switching for the RSC.

FEATURE DESCRIPTION

For call processing purposes, the RCC (remote cluster controller) is viewed as an LTC with 16 DS1 host network ports. The speech bus of the RCC contains 32 channels per port.

Each equipped DS1 port utilizes 24 channels for speech and 1 channel for signalling, the remaining 7 channels are looped back for intra switching. Each unequipped port has all 32 channels looped back for intra switching purposes. Intra switching will be attempted on the RLCM first and if blocking should occur at that level then intra switching will be attempted at the RCC level using intra RCC channels.

The type of agents allowed for intra switched calls are as in F1453 FDOC BF0260 RLCM intra calling.

References: FDOC BF0256, BF0260, BF0367

Package	NTX150AA03 RSC - INTRA RSC CALLING
Feature set	RSC INTRA CALL
Feature	RSC - INTRA SWITCHING
Feature no	F1390

FEATURE SYNOPSIS

Provides intra-switching capability for RSC.

FEATURE DESCRIPTION

Intraswitching will be available on those peripherals having channels specifically reserved for it. Intraswitching allows agents located on the same peripheral to be connected remotely, without the use of CC links. Intraswitching will be allowed on IBN, 3 way calling, call waiting and call forwarding lines.

Reference: FDOC BF0367

Package	NTX150AA03 RSC - INTRA RSC CALLING
Feature set	ADMINISTRATION
Feature	INTRASWITCHING OMS
Feature no	F3820

FEATURE SYNOPSIS

This feature provides the OM capability for intra-switching on RLCM and RSC sites. The measurements provide call event (PEG) counts and usage for the small and large remotes.

FEATURE DESCRIPTION

Small Remote (RLCM)

The measurements are taken on intra-site calls that have the following properties:

- originated at remote
- access granted to digit receiver
- passed dialling features
- passed destination busy checks
- passed network blocking
- terminated at same remote

Intra switching is not attempted on:

- service analysis calls
- three way in effect calls
- custom calls
- features in effect calls
- calls containing a receiver or echo supressor
- calls containing a sender
- calls having attenuation pad exceeding the maximum

OMS performed:

- PEG: intra site line to line call attempts
- PEG: intra site line to line calls blocked
- USAGE: intra switching channels traffic busy
- PEG: inter unit call attempts
- PEG: inter unit calls blocked
- USAGE: inter unit channels traffic busy
- PEG: intra unit 0/1 call attempts
- PEG: intra unit 0/1 calls blocked by all busy
- USAGE: intra unit 0/1 channels traffic busy

LARGE REMOTES

The measurements are taken on the following intra site call types :

- line to line

-line to trunk
-trunk to line
These calls have the following properties:
-originate at the remote
-access granted to digit receiver
-passed dialling failures
-passed destination busy check
-passed network blocking
-passed trunk blocking
-terminate at the same remote

Oms performed :

- PEG : line to line call attempts
- PEG : line to line calls blocked by all intra-switching channels busy
- PEG : line to trunk call attempts
- PEG : line to trunk calls blocked etc.
- PEG : trunk to line call attempts
- PEG : trunk to line calls blocked etc.
- USAGE : intra-switching channels traffic busy

References:

NTP 297-1001-114 DMS-100F OMS
NTP 297-1001-518 DMS-100F OM MMI
FDOC BC1154

Package	NTX150AA03 RSC - INTRA RSC CALLING
Feature set	RSC INTRA CALL
Feature	RSC - INTRA SWITCHING OMS
Feature no	F5508

FEATURE SYNOPSIS

Provides the operational measurements necessary to monitor intra switching usage in the RSC.

FEATURE DESCRIPTION

Intra switching is a feature allowing calls which both originate and terminate within a remote to be switched internally to that remote, via intra switching links. Once the connection is established, the DS-1 channel to the host office used for origination will be released for other uses. Should no idle intra switching link be available the call will be switched via the host office.

The DS-1 links and the intra switching links, among other equipments, are provisioned based on traffic requirements.

Intra switching OM provides telco with measurements useful for equipment provisioning for the remote site.

A set of measurements on intra switched calls and intra switching link usage will be taken.

Note that intra switched calls on which measurements are taken consist of line to line, line to trunk, trunk to line, or trunk to trunk calls, and have the following properties:

- . originated at given large remote
- . granted access to digit receiver (if needed)
- . passed various dialing failures
- . passed destination busy check
- . obtained channel for terminator
- . terminated at same large remote

Furthermore, intra switching will not be attempted on:

- . service analysis calls
- . three way in effect calls
- . custom calls
- . features in effect calls
- . calls containing a receiver or echo suppressor
- . calls containing a sender
- . calls having attenuation pad exceeding the maximum value allowed for the remote

Note also that having passed the above checks, the host office will automatically direct the remote to intra switch the call regardless of a possible intra switching channel overflow condition. Should overflow occur, the remote will report blocking to the host office for re-switching the call via host network, and blocking pegs will be incremented but pegs for call attempts will not be decremented.

There are several types of intra switched calls possible in the RSC. These types are line to line, line to trunk, trunk to line, and trunk to trunk. A line to line call originates and terminates at a line, where a line is either a LCM or a RLCM. Various configurations can support line to line calls. Configuration 1 - a LCM off an RSC. Calls originate and terminate on this LCM. Configuration 2 - two LCMs off the same RSC. Calls originate on one LCM and terminate at the other LCM. Note: For the above two configurations, the LCMs could also be RLCMs. Line to trunk calls originate at a line (LCM or RLCM) on the RSC and terminate at a trunk on the same RSC. Trunk to line calls originate at a trunk on a RSC and terminate at a line (LCM or RLCM) on the same RSC. Trunk to trunk calls originate and terminate at different trunks on the same RSC.

With a RSC equipped to intra switch only a certain maximum number of lines on the RSC are allowed to intra switch. If all these lines are intra switched and an intra switch call is requested, the intra switch call is reported as blocked and the call is handled by the CC.

An interesting case arises with an intra switch equipped RLCM hanging off an intra switch equipped RSC. If a call requests intra switching at the RLCM and the RLCM has no more available intra switch lines then the RLCM blocks the call back to the RSC which attempts to intra switch the call at the RSC level. This type of call is pegged in the RLCM intra switch OMS (OM group RLCMIS).

The following measurements will be performed for each RSC:

1. PEG: RSCISALL : total intra switched line to line call attempts
2. PEG: RSCISBLL : total intra switched line to line calls blocked by all intra switching channels busy condition (subset of above)
3. PEG: RSCISALT : total intra switched line to trunk call attempts
4. PEG: RSCISBLT : total intra switched line to trunk calls blocked by all intra switching channels busy condition (subset of above)
5. PEG: RSCISATL : total intra switched trunk to line call attempts
6. PEG: RSCISBTL : total intra switched trunk to line calls blocked by all intra switching channels busy condition (subset of above)
7. PEG: RSCISATT : total intra switched trunk to trunk call attempts

8. PEG: RSCISBTT : total intra switched trunk to trunk calls blocked by all intra switching channels busy condition (subset of above)
9. USAGE: RSCISCBU : intra switching channels traffic busy.

Package	NTX150AA03 RSC - INTRA RSC CALLING
Feature set	TRUNKING
Feature	RSC INTRASWITCHED END TO END SIGNALLING
Feature no	F5938

FEATURE SYNOPSIS

The end to end signalling feature provides the electronic business set with the ability to output dual tone multi-frequency (DTMF) digits while calls are in a talking stall. This feature provides the same ability to electronic business set users when the call is intraswitched on a remote switching centre (RSC).

FEATURE DESCRIPTION

An intraswitched call is a call made between two parties located on the same peripheral, using a connection via the peripheral rather than the host network.

When end to end signalling is activated by depressing a digit key, DTMF tones are outputted via a path from the DTMF tone generator card within the RSC. Once the tone is outputted, the speech path is reconnected to preserve the cross connection. For each digit key depressed, 130 msec of DTMF will be outputted. Between outputting of digits the speech path is reconnected.

Ref: AG0068

Package	NTX150AA03 RSC - INTRA RSC CALLING
Feature set	RSC INTRA CALL
Feature	RCC LINE INTRASWITCHING PADS
Feature no	F6285

FEATURE SYNOPSIS

This feature inserts odB of loss on all line to line intra-switched calls to maintain a consistent grade of service between host switched and intra switched calls.

FEATURE DESCRIPTION

Talker echo is controlled in the DMS Family by insertion of loss in the receive path of each line card. The amount of loss is determined by the talker echo path delay. On RSC's which are located at greater than 80 km from the host, a certain loss is required for echo control. Line to line RSC calls which are intra switched at the RSC now have equal loss with calls which are host switched. This feature will insert a odB pad value instead of the value specified in PADDATA for intraswitched RSC line to line calls.

Ref: DDOC AG0318

NTX152AB01 Status: RTM RSC TRUNKING (UPG. OF NTX152AA)

TRUNKING	:	
RSC TRUNK INTASWITCHING DYNAMIC CHANNELS		F1389
RSC - RCC TRUNK CALL PROCESSING		F1406
RSC - ROUTING CONTROL		F1407

Package	NTX152AB01 RSC TRUNKING (UPG. OF NTX152AA)
Feature set	TRUNKING
Feature	RSC TRUNK INTASWITCHING DYNAMIC CHANNELS
Feature no	F1389

FEATURE SYNOPSIS

This feature provides trunk intraswitching and dynamic channel assignment for trunks in the rsc.

FEATURE DESCRIPTION This feature provides the RSC with the capability for trunk intraswitching as well as to allow the call to revert back to a network connection when necessary.

In order to economically extend the geographic coverage of the DMS-100 Family of switching systems, REMOTE peripherals have been introduced. Remotes are specially equipped standard DMS Advanced peripherals which are remotely located and are accessed by the office via a DS1 digital transmission facility and a host office controller. Remote peripherals offer advantages such as centralized maintenance and administration, traffic concentration and allows the introduction of DMS-100 Family features to subscribers that could not be so served in the past. A major cost associated with serving customers at distant locations is the cost of outside plant; i.e. the cost of copper loop, distribution frames, repeaters, etc. This cost can be controlled to a large extent on remote peripherals if :

- Subscribers are assigned to peripherals in such a fashion as to ensure that a large portion of their calls are made to parties also served by that same peripheral.
- Peripherals have the ability to make connections between subscribers that are served by it through its own resources; i.e. using its own network connections.

Peripherals which have this ability to switch calls internally have intraswitching (I/S) capability. A peripheral with I/S will upon instruction from the CC switch a call internally. The prime advantage of I/S is a reduction in the number of circuits required from the remote peripheral to the host system without any loss in capacity.

In order to migrate even more of the actual call switching away from the host side and thereby achieve an even greater saving in outside plant, the Remote Switching Centre (RSC) has been developed. The RSC serves as a remote switching point for a number of trunks and line peripherals modules (LCM, RLCM).

Ref: FDOC BC1281, BC1363.

Package	NTX152AB01 RSC TRUNKING (UPG. OF NTX152AA)
Feature set	TRUNKING
Feature	RSC - RCC TRUNK CALL PROCESSING
Feature no	F1406

FEATURE SYNOPSIS

This feature modifies the LTC trunk call processing code for use by the RSC.

FEATURE DESCRIPTION

The RSC will utilize as much as possible of the existing code for LTC call processing. The LTC trunk call processing code is retained essentially unchanged for RSC trunk call processing.

Ref: BF0482

Package	NTX152AB01 RSC TRUNKING (UPG. OF NTX152AA)
Feature set	TRUNKING
Feature	RSC - ROUTING CONTROL
Feature no	F1407

FEATURE SYNOPSIS

This feature provides flexible site dependent routing for trunks off of an RSC.

FEATURE DESCRIPTION

This feature allows the user to select a route depending on the originating station's location and therefore permit a more efficient routing of calls by datafilling (in the routing tables) a priority list of routes to choose from. By intra-calling within an RCC, the customer can cut down on the number of T1 links required to the host.

References:

FDOC BC1279

NTX154AA03 Status: RTM RLCM - EMERGENCY STAND ALONE OPERATION

ESA-RLCM	:	
ESA - TAKEOVER/TAKEBACK		F1449
ESA - TRANSLATION		F1450
RLCM ESA - TABLE CONTROL		F1451
RLCM ESA - CALL CONTROL		F1452
ESA - RLCM	:	
RLCM - ESA MAINTENANCE SUPPORT		F3406
EAS - RLCM	:	
RLCM-ESA - SINGLE PROCESSOR CONFIGURATION		F5474
ESA - RLCM	:	
ESA EXIT SUPPORT FOR RLCM		F5919
ENHANCED CC MAINTENANCE SUPPORT FOR RLCM		F5920
MAINTENANCE	:	
RLCM/RCE ESA CHANNEL CAPACITY INCREASE		F6303

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	ESA-RLCM
Feature	ESA - TAKEOVER/TAKEBACK
Feature no	F1449

FEATURE SYNOPSIS

The Remote Line Concentrating Module (RLCM) is a Line Concentrating Module (LCM) designed to operate at a remote location from the host site. Communication between the RLCM and host site is by means of a DS-1 protocol link. The link may be susceptible to damage by people, animals or natural causes. If the link is damaged and communication to the RLCM disrupted, all customers to the RLCM are denied service.

To overcome this loss of service, the RLCM may be equipped with an optional module that provides limited call processing service during periods of communication failure with the host. This optional module is known as Emergency Stand Alone (ESA).

This feature provides the mechanisms involved in entering the ESA mode of operation and those involved in recovering the RLCM from ESA operation when host site communication is restored. These procedures are called ESA enter and exit respectively.

This feature supports COLD ENTER or EXIT where all active calls on the peripheral are taken down. Warm enter or exit are not supported by this feature.

FEATURE DESCRIPTION

The RLCM determines when ESA operation is required by detecting the loss of communication with the host site. ESA enter is initiated and the ESA processor assumes call processing. The time span between loss of communication and ESA mode depends on the type of failure. In the case of loss of carrier on a link of loss of messaging the RLCM enters ESA mode by a datafillable parameter.

When communications are restored to the host, the RLCM initiates the ESA exit sequence but does not immediately recover the peripheral from ESA mode. A time out period is established to allow the links to stabilize before recovery is attempted.

Under normal circumstances the CC automatically recovers the RLCM from the ESA mode of operation.

This is referred to as 'system exit'. It is possible for the craftsperson to override the system exit by forcing the RLCM to a manual busy state. Under conditions of manual exit, no automatic attempt is made by the CC to recover the RLCM from ESA. The craftsperson assumes full responsibility for recovery.

Ref: BF0497

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	ESA-RLCM
Feature	ESA - TRANSLATION
Feature no	F1450

FEATURE SYNOPSIS

This feature provides translation facilities for the Remote Line Concentrating Module Emergency Stand Alone option (RLCM ESA) line to line call operations.

FEATURE DESCRIPTION

When a line origination is detected, the line translation for the terminal is invoked to determine what line it is, e.g., DP or DT/DP line, automatic line etc. When the originator sends in digits, these collected digits are translated to the terminator terminal. If no termination can be found from the digit translation, then reorder tone is applied to the originator.

The ESA translation acts upon a set of translation data. The translation data is used only during ESA mode operation. When the RLCM is under the host control, the translation is performed in the host CC. The ESA translation data is a subset of the host CC translation data enough to support the ESA operating environment. In the ESA environment, only basic calls are supported, no special features on the lines. The following types are supported:

- single party flat rate
- individual message rate (as single party flat rate)
- two party flat rate
- four party flat rate fully selected (without ANI)
- eight party flat rate semi-selective (without ANI)
- multiparty flat rate (without ANI)
- coin line with refund for coin dial tone first, coin first and coin free dialing
- semi-postpay with no coin refund
- PBX lines
- loop and ground start lines
- electronic business set (PDN key, hold key and release key)
- digital data unit (PDN key, hold key and release key)
- lines with cutoff on disconnect option (cutoff relay is operated for 300ms).

The following services are provided:

- services for single party, multiparty, coin and PBX lines
- up to 16 prefix or special numbers of 15 digits each for special termination, e.g., 0+, 411, 911 etc
- three to seven digits local dialing plan

- invalid or vacant terminations are routed to reorder or announcement termination.

Ref: BF0494

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	ESA-RLCM
Feature	RLCM ESA - TABLE CONTROL
Feature no	F1451

FEATURE SYNOPSIS

This feature handles the collecting and downloading of translation data used to process calls in a remote line concentrating module (RLCM) while it is in the emergency stand alone (ESA) mode of operation.

FEATURE DESCRIPTION

The translation data necessary for call processing in a RLCM while in the ESA mode operation is a subset of the translation data present in the host office.

The data is downloaded to the ESA processor by the craftsperson initiating a maintenance administration position (MAP) command to load the peripheral (RLCM) or a return to service command. Automatic daily updates are requested by the ESA processor or if the processor cannot process calls with existing data.

Ref: BF0495

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	ESA-RLCM
Feature	RLCM ESA - CALL CONTROL
Feature no	F1452

FEATURE SYNOPSIS

This feature provides the software necessary for the Emergency Stand Alone (ESA) processor of the Remote Line Concentrating Module (RLCM) to handle line to line call processing. Call progress tones are provided during ESA.

FEATURE DESCRIPTION

The ESA CC is responsible for emulating the central control while the peripheral is unable to communicate with the host. The ESA CC is a module of software residing in the ESA processor for handling call processing in the ESA mode on a RLCM. The ESA CC handles line to line calls only on an RLCM.

The ESA CC processor supports the following five call progress tones: busy, reorder, receiver off-hook (ROH), audible, warble and dial tone. These tones are provided by the ESA clock and tone card.

Ref: BF0493, BF0262, BF0496

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	ESA - RLCM
Feature	RLCM - ESA MAINTENANCE SUPPORT
Feature no	F3406

FEATURE SYNOPSIS

This feature provides the CC resident maintenance support for the emergency stand alone (ESA) feature for the remote line concentrating module (RLCM) allowing the RLCM to enter and exit ESA in a controlled fashion. Support is provided for MAP display and commands; ESA diagnostics; office data management and link maintenance.

FEATURE DESCRIPTION

ESA is an optional feature of the RLCM. First it is necessary to datafill the option to indicate that ESA is available in an RLCM. Secondly, the craftsperson is able to interface to the maintenance system and the LOG system.

The maintenance support consists of:

- PM states which control the system configuration.
- MAP interface to allow the craftsperson to control the PM
- System actions to recover from faults
- Audits to monitor for faults
- LOG interface to monitor the system
- Other support to control resources such as links
- Diagnostics to allow fault identification and isolation

This feature also provides for PM logs and operational measurements (OMs).

Communication to the ESA processor is over the same physical DS-1 links as the RLCM. Two links are used for messaging to the RLCM.

The maintenance system will identify a faulty link and remove it from service. The other link will continue to support the RLCM messaging.

The ESA processor is controlled via an ESA map level accessed from the PM map level. This feature also provides for the routing exercise of the ESA hardware to test the parts of the hardware that are not used during normal service of the ESA processor.

These tests are invoked either on a routine basis, or using the TST command.

A hardware link loop around will also be performed to ensure that the ESA message channels are not faulty.

Ref: BC0990, BF0271, BF0262, BF0546, BF1028

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	EAS - RLCM
Feature	RLCM-ESA - SINGLE PROCESSOR CONFIGURATION
Feature no	F5474

FEATURE SYNOPSIS

This feature creates a base load for the ESA (emergency stand alone) service processor of an RLCM. The base load may be loaded from the host CC and returned to service, it provides the existing LTC debugging tools.

FEATURE DESCRIPTION

The ESA unit consists of:

- an LTC processor card (NT6X45AA)
- two or three 384K memory cards (6X47AA)
- an ESA clock and tone card (6X75)

The processor and memory cards are the same as in an LTC.

The ESA clock and tone card provides clock and tone during ESA as well as an interface for the ESA processor to message the host, both units of the RLCM and the RMM.

The feature reconfigures the standard RLCM software to run in single processor.

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	ESA - RLCM
Feature	ESA EXIT SUPPORT FOR RLCM
Feature no	F5919

FEATURE SYNOPSIS

This feature provides the CC resident maintenance support for the emergency stand alone (ESA) exit from the remote line concentrating module (RLCM). The function of ESA is to provide limited call processing to the RLCM node when it loses communication with the host site.

FEATURE DESCRIPTION

The entry into ESA is controlled by the RLCM as the CC is not able to communicate to the RLCM when it is required to enter ESA. An office parameter controls the entry timeout value.

The entry timeout value is sent to the RLCM as part of the ESA information in its static data load, and controls the time the RLCM waits for resumption of communication after a fault before entering ESA.

The exit from ESA is controlled by the CC when it finds that it is once again able to communicate with the RLCM. An office parameter specifies the time the CC waits after the resumption of communications before the RLCM is asked to leave ESA.

If the timeout value is set to zero then the system leaves the RLCM in ESA until a return to service (RTS) command is given from the MAP.

Manual exit from ESA may also be attempted by the craftsperson in which case the MAP will display the number of active ESA calls and then ask if it is desired to continue with the action. Note that this feature supports a 'cold' exit from ESA in which ESA calls are lost. 'Warm' exit from ESA is not presently supported for the RLCM by this feature.

Ref: AL0070

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	ESA - RLCM
Feature	ENHANCED CC MAINTENANCE SUPPORT FOR RLCM
Feature no	F5920

FEATURE SYNOPSIS

This feature provides the CC maintenance support software for the remote line concentrating module emergency stand alone (RLCM ESA) processor to allow the ESA processor to provide call processing while in the ESA mode and entry and exit from ESA.

FEATURE DESCRIPTION

This feature provides the CC resident maintenance support for call processing on the emergency stand alone (ESA) software module of a RLCM. The function of the ESA is to provide limited call processing to the RLCM node when it loses communication with the host site.

The ESA option for RLCMs provides matches the ESA mode currently provided on RLCMs.

The CC maintenance support for ESA call processing includes:

- office data management
- ESA call processing data
- automatic updating of ESA call processing data.

Additional support for ESA consists of:

- RLCM data requirements
- RLCM loop around message support.

Ref: AL0071

Package	NTX154AA03 RLCM - EMERGENCY STAND ALONE OPERATION
Feature set	MAINTENANCE
Feature	RLCM/RCE ESA CHANNEL CAPACITY INCREASE
Feature no	F6303

FEATURE SYNOPSIS

This feature allows all RLCM or RCC intra channels to be used under ESA call processing.

FEATURE DESCRIPTION

Under ESA conditions intra as well as inter channels are used to make call connections. This increases the number of intra channels available under ESA for both the RSC and RLCM. The call capacity under ESA will therefore increase proportionately.

Ref: DDOC AG0344

NTX156AA02 Status: RTM INTRA RLCM CALLING

ENHANCED CALL HANDLING	:	
RLCM - INTRA SWITCHING		F1453
ADMINISTRATION	:	
INTRASWITCHING OMS		F3820
RLCM INTRASWITCHING		F5579
ENHANCED CALL HANDLING	:	
RLCM INTRASWITCHED END TO END SIGNALLING		F5915

Package	NTX156AA02 INTRA RLCM CALLING
Feature set	ENHANCED CALL HANDLING
Feature	RLCM - INTRA SWITCHING
Feature no	F1453

FEATURE SYNOPSIS

Provides intra switching for the RLCM.

FEATURE DESCRIPTION

Intra switching is the term used to describe the connection between two parties located on the same peripheral via the peripheral rather than the network. This reduces the usage of the DS1 channels between the LTC and the CC. The various types of agents allowed to intra switch are 1FR, 2FR (2, 4 and 8 party), IBN lines, p-phones and data units. In addition lines with call waiting or threeway calling will be allowed to intraswitch i.e. intraswitched calls invoking features will result in the call reverting to a regular network connection.

Reference: FDOC BF0260, BF0367

Package	NTX156AA02 INTRA RLCM CALLING
Feature set	ADMINISTRATION
Feature	INTRASWITCHING OMS
Feature no	F3820

FEATURE SYNOPSIS

This feature provides the OM capability for intra-switching on RLCM and RSC sites. The measurements provide call event (PEG) counts and usage for the small and large remotes.

FEATURE DESCRIPTION

Small Remote (RLCM)

The measurements are taken on intra-site calls that have the following properties:

- originated at remote
- access granted to digit receiver
- passed dialling features
- passed destination busy checks
- passed network blocking
- terminated at same remote

Intra switching is not attempted on:

- service analysis calls
- three way in effect calls
- custom calls
- features in effect calls
- calls containing a receiver or echo supressor
- calls containing a sender
- calls having attenuation pad exceeding the maximum

OMS performed:

- PEG: intra site line to line call attempts
- PEG: intra site line to line calls blocked
- USAGE: intra switching channels traffic busy
- PEG: inter unit call attempts
- PEG: inter unit calls blocked
- USAGE: inter unit channels traffic busy
- PEG: intra unit 0/1 call attempts
- PEG: intra unit 0/1 calls blocked by all busy
- USAGE: intra unit 0/1 channels traffic busy

LARGE REMOTES

The measurements are taken on the following intra site call types :

- line to line

-line to trunk
-trunk to line
These calls have the following properties:
-originate at the remote
-access granted to digit receiver
-passed dialling failures
-passed destination busy check
-passed network blocking
-passed trunk blocking
-terminate at the same remote

Oms performed :

- PEG : line to line call attempts
- PEG : line to line calls blocked by all intra-switching channels busy
- PEG : line to trunk call attempts
- PEG : line to trunk calls blocked etc.
- PEG : trunk to line call attempts
- PEG : trunk to line calls blocked etc.
- USAGE : intra-switching channels traffic busy

References:

NTP 297-1001-114 DMS-100F OMS
NTP 297-1001-518 DMS-100F OM MMI
FDOC BC1154

Package	NTX156AA02 INTRA RLCM CALLING
Feature set	ADMINISTRATION
Feature	RLCM INTRASWITCHING
Feature no	F5579

FEATURE SYNOPSIS

This feature will extend intraswitching to fully featured environments such as IBN, AUTOVON and SCOPEDIAL.

FEATURE DESCRIPTION

In addition to the call types which are now allowed to be intraswitched, calls which invoke features will be allowed to intra switch but the call will revert to a regular network connection once the feature has been invoked. This does not apply to coin calls which will always be switched via a regular network connection.

Ref: FDOC BF0914

Package	NTX156AA02 INTRA RLCM CALLING
Feature set	ENHANCED CALL HANDLING
Feature	RLCM INTRASWITCHED END TO END SIGNALLING
Feature no	F5915

FEATURE SYNOPSIS

The end to end signalling feature provides the electronic business set with the ability to outpulse dual tone multi-frequency (DTMF) digits while calls are in a talking state. The regular end to end signalling feature works on non-intraswitched calls only. This feature provides the same ability to electronic business set users when the call is intraswitched on a remote line concentrating module (RLCM).

FEATURE DESCRIPTION

An intraswitched call is a call made between two parties located on the same peripheral, using a connection via the peripheral rather than the host network.

The RLCM itself does not have the capability of generating DTMF tones. Hence to provide end to end signalling, the call will be unintraswitched back to a host network connection. The incapability to generate DTMF tones in an RLCM implies that end to end signalling will not work in emergency stand alone (ESA) mode.

The end to end signalling is invoked when a digit key is depressed.

Ref: AG0067

Package	NTX157AA01 CCIS - INWATS OSO
Feature set	SCREENING
Feature	CCIS - INWATS OSO
Feature no	F2435

FEATURE SYNOPSIS

DESCRIPTION

This feature provides enhanced INWATS OSO (Originating Screening Office) function using the direct signalling capability of CCIS. The enhanced INWATS OSO function is designed to augment but not replace the existing INWATS OSO function.

A brief summary of the existing INWATS OSO capability is given, followed by a description of the new facilities introduced by this feature. Detailed descriptions of both the new and old systems may be found in Notes on the Network and AT&T Technical Advisory No. 38, Issue 2.

The current INWATS OSO functions are as follows:

1. The call must be recognized as an INWATS call.
2. The rate band of the call must be determined.
3. The call must be routed to the TSO (Terminating Screening Office).

The enhanced INWATS OSO functions are as follows:

1. The call must be recognized as an INWATS call.
2. The originating NPA of the call must be determined.
3. A Direct Signalling inquiry message is sent to the NCP (Network Control Point) associated with the OSO.
4. The reply message is analyzed and the POTS number corresponding to the INWATS number is extracted.
5. The call is then routed via standard POTS translation through the network, or the appropriate treatment is applied to the call.

The following additional functions are provided by this feature.

1. The OSO must be capable of handling network management control directives from the NCP by blocking the affected calls.
2. In the event that the NCP is unable to return a POTS number for a given INWATS number, the OSO must route the call via the existing INWATS scheme.

3. The OSO should be able to initiate a test call for any INWATS number as if it originated from any NPA served by the OSO. The response from the NCP should be available to the originator of the call.
4. The OSO should be able to send a Direct Signalling inquiry message and inspect the reply from the NCP through the MMI.

Network Management Requirements

The blocking requirements for this feature are similar in spirit to the existing network management code block controls but rather different in detail. Upon receipt of a INWATS NWM message from the NCP, the OSO must be capable of implementing blocking for the 6-digit (NPA-NXX) or 10-digit (NPA-NXX-XXXX) code given in the message. The OSO must then stop sending NCP inquiry messages for the given code for an initial t-seconds (where $3 \leq t \leq 300$ and is specified as part of the direct signalling message) and then send a maximum of 1 NCP inquiry message every t seconds for the next 5 minutes. At that time, the blocking for the code is removed and NCP inquiry messages can be sent as required. If a NWM message is received for a code that is currently being blocked, the existing block is cancelled and the new block is implemented (in practice, this will usually mean only a change in the t-value along with a resetting of the 5 minute timer). Also, 10-digit blocks have precedence over 6-digit blocks.

REFERENCES

1. Notes On the Network
2. ATT Technical Advisory No. 37, Issue 2 (CCIS Direct Signalling Requirements)
3. ATT Technical Advisory No. 38, Issue 2 (CCIS 800 Service Specification Document)
4. Feature F0560 - Direct Signalling

NTX159AA06 Status: RTM BELLCORE LAMA FORMAT

ATT LAMA FORMAT ENHANCEMENT	F1884
NUMBER IDENTIFICATION/CHARGING :	
A T & T CAMA FORMAT	F2378
A T & T - LAMA FORMAT	F2439
IBN COMPATIBILITY WITH ATT LAMA FORMAT AND MUMR	F2512
ADMINISTRATION :	
CALL CODE 009,003 & 121 ASSIGNMENT VIA TRANSLATION	F2759
SWITCHING AND TRANSLATIONS :	
DATAPATH AMA FORMAT-CALL CODES 072,117,121	F2793
ADMINISTRATION :	
RENAME ATT AMA TO BC AMA	F5549
NUMBER IDENTIFICATION/CHARGING :	
BC AMA INTERLATER WATS CALL CODE III	F5684

Package	NTX159AA06 BELLCORE LAMA FORMAT
Feature set	
Feature	ATT LAMA FORMAT ENHANCEMENT
Feature no	F1884

FEATURE DESCRIPTION

By providing new AMA record types (call codes) and enhancements to existing record types, this feature extends the capabilities of the following features:

R0378 - AT&T AMA FORMAT
C0504 - SST DETECTION
C0505 - AT&T TOLL AMA
R0439 - AT&T LOCAL AMA

1 - NEW RECORD TYPES

1.1 - Conference Trunk Usage

Call Code 026 (ref LSSGR 8.1.1.8.A, LSSGR 8.1.2.1.D.b)

A conference trunk usage record will be generated for each POTS three-way call. This record will include the seizure and release time of the conference circuit and the directory number of the controlling party. Seizure time is defined as the answer time of the added-on connection (second leg of the call). Release time is defined as the time of disconnect of any party from the three-way call. This record will be formatted using structure code 00076.

1.2 - Call Forwarding Activation/Continuation/Deactivation

Call code 031 (ref LSSGR 8.1.1.8.B, LSSGR 8.1.3.3)

A call forwarding activation record will be produced for each activation of the call forwarding feature. This record will include the customer's directory number, the forwarded-to directory number, the activation time and date, and the duration of the call. A call forwarding activation record will be produced upon each deactivation of the call forwarding feature. The call forwarding activation records will be formatted using structure code 00096.

A call forwarding continuation record (also referred to in the LSSGR as a call forwarding long-duration record) will be produced for each activation of the feature that has been operative over two successive midnights. This record will contain the customer's directory number, the forwarded-to directory number, the activation time and date, and the present time and date.

This record also will also include the long-duration record type indicators (A, B, C and D). These are to be interpreted in exactly the same way

as for normal long-duration call records. This record is formatted using structure code 00096.

It should be noted that for the purpose of Call Forwarding Activation and Continuation AMAB log reports, the answered field will be set to 'YES' in all cases.

2 - ENHANCEMENTS TO EXISTING RECORD TYPES

2.1 - Service Feature Field

(ref LSSGR 8.1.4.2.B.7 & LSSGR Appendix A, Table 12)

The service feature field is used to identify specific features of a particular call. The following service feature field codes will be implemented by this feature:

2.1.1 - Hotel/Motel Message Register Service

(ref LSSGR 8.1.1.4)

Hotel/Motel message register calls will include an indication in the service feature field.

2.1.2 - Prepay and Postpay Coin

(ref LSSGR 8.1.1.5)

Calls originating from a coin station that require ama treatment will include an indication in the service feature field.

2.1.3 - INWATS Calls

(ref LSSGR 8.1.1.7)

Calls that terminate on an INWATS line will include an indication in the service feature field.

2.1.4 - Three Way Calling

(ref LSSGR 8.1.1.8.A)

(Note: This part of the feature was)

(Implemented in BCS11)

If the third leg of a three way call requires AMA treatment, the record produced will include an indication in the service feature field.

2.1.5 - Call Forwarding

(ref LSSGR 8.1.1.8.B)

(Note: This part of the feature was)

(Implemented in BCS11)

If the terminating leg of a call-forwarding call requires AMA treatment, the record produced will include an indication in the service feature field.

2.1.6 - Remote Call Forwarding

(ref LSSGR 8.1.1.8.C)

(Note: This part of the feature was)

(Implemented in BCS11)

AMA records produced for the terminating leg of a remote call forwarding call (i.e. the leg from the base station to the remote station) will include an indication in the service feature field.

The remaining service feature field indications (as listed below) will not be implemented by this feature:

- Hotel/Motel sans Tax
- Picturephone
- Chargeable Quotation
- Dataphone
- Hotel/Motel with Tax
- Call Forwarding Busy/Don't Answer

2.2 - Network Completion Study Indicator (ref LSSGR 8.1.1.11.F)

A separate Network Completion Study Indicator is no longer required as an AMA option to measure subscriber dialed toll service, since this capability is already provided via the UNANSW option in table AMAOPTS.

2.3 - Message Register Not Stroked Indicator (ref LSSGR 8.1.1.4.A)

Message register pulsing was provided by feature R0440. If message register pulsing fails (i.e. if the peripheral is not able to deliver the pulsing), the message register not stroked indicator in the timing indicator field is to be included in the AMA record for the call.

Package	NTX159AA06 BELLCORE LAMA FORMAT
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	A T & T - LAMA FORMAT
Feature no	F2439

FEATURE DESCRIPTION

DMS-100 machines must produce AMA records in a format which is compatible with the AT&T specifications for local switching systems. In addition, a variety of recording options not currently supported by DMS-100 must be provided to meet AT&T requirements.

Specific details of the AT&T Local AMA Format are covered in the LSSGR. This DID relates the requirements in the LSSGR to existing DMS-100 capabilities and highlights the areas where development is needed.

The requirements for Features R0378 (AT&T AMA Format), C0505 (AT&T Format for AMA Records and AMATAPE), and C0504 (Short Supervisory Transition (SST) Detection) are a subset of the requirements for R0439. The capabilities developed for these features will be utilized and augmented as much as possible to meet the requirements of R0439.

The intent is to produce the same subset of the requirement as was done by DMS-10, as well as some straightforward enhancements if they can be implemented within the BCS-11 time frame. Any additional enhancements will be defined and implemented at a later date.

The DMS-10 offering covered message rate, station paid, directory assistance, long duration, trunk network numbers, Subscriber Line Usage (SLU) originations, and Complaint Observing (discussed under -- Heading id 'Studies' unknown --). Specific requirements not implemented in DMS-10 will be identified as such when they are mentioned in this DID.

This document discusses all the elements of the AT&T Local AMA Format as described in the LSSGR. A complete prioritization of these items for BCS-11 and beyond appears in Section 5, -- Heading id 'Prior' unknown --.

SUMMARY OF CAPABILITIES DEVELOPED FOR R0378, C0505, C0504**AMA RECORDING IN AT&T FORMAT (C0505)**

This capability allows recording of AMA data in AT&T format while minimizing the impact on call processing. It also includes a utility to dump the contents of an AT&T AMA tape for examination. The existing implementation handles the call types which occur in the toll environment (subsystem ATATSUB). It must be extended to handle all the call types which occur in the local environment. This extension should not affect the toll environment.

AMA RECORDING OPTIONS AND OPTION SCHEDULING (R0378)

Table AMAOPTS controls the recording of call types and call data not normally included in AMA records. All AMA options required in the toll environment are scheduled through this table. Additional options required in the local environment (described under 'AT&T Local AMA Options') should also be scheduled through this table, in such a way that they only affect the local environment.

SST DETECTION, REPORTING, AND HANDLING (C0504)

Short Supervisory Transition (SST) detection is implemented by Feature C0504 for CAMA trunks only. If required on interlocal trunks or lines, it must be detected in the peripheral modules. DMS-10 did not implement any SST detection. It will not be included in R0439, but may be a separate feature.

LONG DURATION CALL DETECTION, REPORTING, AND HANDLING (R0378)

The method used in R0378 (auditing active CCB's) will work equally well for local calls. An additional audit will be required for reports of long-duration call forwarding activation (LSSGR Sections 8.1.1.8-B and 8.1.3.3). This was not done by DMS-10.

OM PEG COUNTS AND TRACER RECORDS (R0378)

The capability developed for R0378 will be extended to the local environment (i.e, peg local calls as well as toll). Since many OM's are pegged by call type, one or more new OM groups (32 fields per group) may be required. The existing format of the tracer record will be extended to include the new OM's. A new structure code may be required. The contents of the tracer record will be defined by BNR, and the value of the structure code will be assigned by AT&T at a later date.

AT&T LOCAL AMA FORMAT

The AMA records to be generated can be classified as

- a. Call records, generated as a result of calls
- b. Statistical records
- c. Miscellaneous records

Each record contains a Structure Code, which uniquely determines the format of the remainder of the record. There are five fields common to all structure codes. The first of these is Call Type. Table 1 (from LSSGR, Section 8, Appendix A) shows the complete set of call types in the AT&T requirement. An asterisk (³) indicates the call types recorded in DMS-10.

TABLE 1 CALL TYPES

BCD Chars	CALL CODE	Meaning	
1-3	³ 001	Detailed Message Rate, Timed, MBI	
	³ 002	Message Rate, Timed, MBI	
	³ 003	Detailed Message Rate, Untimed, MBI	
	³ 004	Message Rate, Untimed, With MBI	
	³ 005	Detailed Message Rate, Timed, No MBI	
	³ 006	Station Paid	
	007	WATS (Station billing number)	
	³ 008	INWATS, Terminating Entry	
	³ 009	Directory Assistance (411)	
	011	FX, Automatic Flexible Routing	
	026	Conference Trunk Usage	
	030	WATS, Automatic Flexible Routing to WATS	
	031	Call Forwarding Activation	
	³ 033	Directory Assistance (555)	
	034	Signaling Irregularities	
	036	SLUS, Terminating Entry	Statistical Records
	037	SLUS, Overflow Counts	-----
	041	Local Coin	042 Time Change
	³ 042	Time Change	071 INWATS Overflow
	³ 067	Flat Rate	037 SLUS Overflow
	³ 068	WATS (Billing number)	
	069	WATS AFR to DDD	
	³ 071	INWATS Overflow Count	Miscellaneous Records
	074	Free Call	-----
	³ 090	Sensor Tracer	090 Sensor Tracer
	³ 092	Sensor/RAO Tracer	092 Sensor/RTO Tracer
			All Others are Call Records

For call records, the Structure Code chosen to record the AMA data for each call type depends on the following conditions:

1. Is the call answered or unanswered?
2. Is it a long duration call?
3. Is Customer Identification required?
(discussed under -- Heading id 'CustId' unknown --, not done by DMS-10)
4. Is a Point-to-Point study in effect?
(discussed under -- Heading id 'PTP' unknown --, not done by DMS-10)
5. Is a Switch Supervisory Unit (trunk id) required?
(determined from Table AMAOPTS, discussed under -- Heading id 'Unansw' unknown --
and -- Heading id 'SSU' unknown --)
6. Is Customer Dialed Account Recording (CDAR) applicable?
(discussed under -- Heading id 'CDAR' unknown --, not done by DMS-10)
7. Is the call eligible for High Runner Call Data Compression?
(LSSGR Section 8.1.4.5, not done by DMS-10, already done by C0505 for Station Paid Call Type 006)
- Certain frequently occurring call types may be recorded in a shortened format if no unusual conditions have occurred.

The exact structure code for each call type under all conditions can be determined from LSSGR Section 8, Appendix C and Section 8.1.4.4. Section 8, Appendix B gives the format for each Structure Code.

GENERATION AND RECORDING OF AT&T AMA DATA

This section describes in brief the generation and recording of AMA data for each call type. Further details can be found in the LSSGR.

FLAT RATE (SERVICE) PLAN**Local Calls**

- Not normally recorded.
- AMA data required only for individual and 2-party lines for special studies (discussed under -- Heading id 'Studies' unknown --) and billable features (discussed under -- Heading id 'Feat' unknown --).
- Recorded as Flat Rate Call Type 067.

Toll Calls

- AMA data required for customer dialled toll calls without operator intervention from individual and 2-party lines, including IDDD and INWATS.
- Recorded as Station Paid Call Type 006.

MESSAGE RATE (SERVICE) PLAN

- Described in R0440 (Multi-Unit Message Rate Service) Functional Description.
- AMA data required for local calls placed by individual or 2-party lines within a message rate service area and outside a small or non-existent flat rate area.
- A local message rate service area is defined by a set of destination codes each of which may have an associated Message Billing Index (MBI).
- Calls may be timed for billing or for study purposes.

- Recorded as a Message Rate Call Type (001 through 005), consistent with local tariffs.
- MBI is recorded in the field "WATS Band or Type Indicator (MBI)".
- Local calls within the optional flat rate area and toll calls from message rate lines are recorded as described under Flat Rate Plan, above.

HOTEL/MOTEL (H/M) MESSAGE RATE SERVICE

- Described in R0440 (Multi-Unit Message Rate Service) Functional Description.
- AMA data for local calls are recorded as described under Message Rate Plan, above, with an indication in the service feature field that the call originated from a hotel/motel line with a message register.
- Pulsing of the message register is a function of the number of message units used as described in LSSGR Section 8.1.1.4 and Tables 8.1-A and 8.1-B.
- AMA data is recorded when message register pulsing fails, with a "Message Register Not Stroked" indicator in the timing indicator field, and log messages to alert the office craft to the pulsing failure. This was not done by DMS-10.
- Toll calls from hotel/motel lines are operator-handled and do not require AMA data.

LOCAL COIN SERVICE

- AMA data normally required only for special studies and fraud detection.
- Optional recording of AMA data for coin calls charged at local office for selected coin lines or all coin lines.
- Recorded as Local Coin Call Type 041.
- Includes a study-generated record indicator in study field.
- None of the above was done by DMS-10.

OUTWATS

- AMA data for OUTWATS call includes:
 - (i) the "WATS Indicator"
 - Full Business Day or Measured Time Service (no indication provided by DMS-10)
 - existing DMS-100 OUTWATS is Measured Time Service only
 - (ii) the "WATS Band" used for the call
 - (iii) the calling NPA (used to check Band)
- Recorded as WATS Billing Number Call Type 068 if WATS line is identified by a standard 7-digit WATS number assigned by the Operating Telephone Company.
- Recorded as WATS Station Detail Call Type 007 when originating station is not a standard WATS line (i.e. IBN (Centrex) OUTWATS). This was not done by DMS-10.

INWATS

- AMA data is required for answered and unanswered INWATS calls.
- Recorded as INWATS Terminating Call Type 008.
- Daily report required of INWATS overflow, i.e. calls blocked due to all lines busy condition, (both real and virtual in IBN environment).
- Recorded as INWATS overflow Count Call Type 007.

VERTICAL SERVICES (CUSTOM CALLING FEATURES)

Usage-sensitive (billable) features as defined in the LSSGR Section 4 are not currently implemented in DMS-100 and are not within the scope of BCS-11.

Three-Way Calling (3WC)

- All of the following also applies to three-way calls from IBN Attendant Consoles (both source and dest present on loop).

- AMA data generated for each leg of the call if recording is normally required.
- If the second leg of the call is recorded, the 3WC indication is included in the Service feature field.
- Conference circuit usage is recorded as Conference Trunk Usage Call Type 026, for each three-way call, whether the legs are recorded or not. Seizure and release times are defined under -- Heading id 'Timing' unknown --. This was not done by DMS-10.
- Note that IBN Call Transfer is billed exactly like Three-Way Calling. The transferring party is billed for the second leg of the call for the duration of the call, even after he has gone on-hook.

Call Forwarding (CF)

- The call from the originator to the base station generates normal AMA data if recording is required.
- The forwarded leg of the call generates AMA data as if it were a call from the base station to the remote station, with a CF indication in the service feature field.
- Activation, deactivation, or long-duration activation of call forwarding (through two successive midnights, see -- Heading id 'LongDur' unknown --) is recorded as Call Forwarding Activation Call Type 031. This was not done by DMS-10. This does not apply to variants of call forwarding activated by service orders, such as IBN Call Forward Busy (CFB) and Call Forward Don't Answer (CFD). The call forwarding indication is included in the service feature field if the user subscribes to the feature on a flat-rate basis, but not if he subscribes on a usage-sensitive basis.
- Confirmation call generates normal AMA data. Note that a confirmation call is not made on activation of IBN call forwarding.

Remote Call Forwarding (RCF)

- Each leg of the call is recorded as for call forwarding.
- The leg from the base station to the remote station, if recorded, includes an RCF entry in the service feature field.
- This was not done by DMS-10.

BUSINESS CUSTOMER FEATURES

Recording of AMA data for Business Customer Features was not done by DMS-10.

Automatic Identified Outward Dialling (AIOD)

This feature identifies PBX stations originating DOD calls. It requires hardware development for DMS-100 and is not within the scope of BCS-11.

Customer Dialed Account Recording (CDAR)

This feature is equivalent to the IBN account code feature, and requires only that the CDAR data be added to the normal AMA data generated for a call. When CDAR data is added, for any call type, the first digit of the structure code becomes:

- Two (2) if SSU (Switch Supervisory Unit)² is not recorded.
- Three (3) if SSU is recorded.

e.g. for an answered station paid call with CDAR, the structure code would be 20001, as opposed to 00001 without CDAR.

Automatic Flexible Routing (AFR)

This feature is equivalent to DMS-100 ESN Automatic Route Selection as planned for BCS-12. AMA data are required for all IBN-originated calls routed under this feature. Depending on routing, the call type may be :

- * 006 Station Paid
- * 007 WATS, Station Detail
- * 011 FX, AFR - Call alternate-routed to FX trunk

² SSU'S are discussed under -- Heading id 'Unansw' unknown -- and -- Heading id 'SSU' unknown --.

* 030 WATS AFR WATS - WATS call alternate-routed to another WATS trunk (not first choice)

* 069 WATS AFR DDD - WATS call alternate-routed to DDD network

Design Note: This may require a new 'call_stage' (parameter of procedure process_all_lama_blocks)

Customer Identification (CI)

This feature provides a unique 4-digit identifier for all calls where the originating number is not the billing number (e.g. IBN lines with SPB option and IBN Attendant Consoles). The feature will be assigned as a customer group option, and the identifiers will be assigned to individual SPB lines and Attendant Consoles through datafill (development required).

SPECIAL CALLS

Directory Assistance (DA)

- Recording of AMA data for DA calls scheduled by AMAOPTS table, already implemented for R0378.

- Will be extended to record local calls.

Unanswered Calls

- AMA data required on an optional basis for:

- (a) all unanswered AMA calls
 - option already implemented for R0378 in Table AMAOPTS
- (b) unanswered local AMA calls
 - local call types to be defined by Operating Telephone Company (in Table AMAOPTS).
 - not done by DMS-10
- (c) unanswered toll calls
 - toll call types:
 - 006, 007, 030, 033, 068, 069
 - (030 and 069 not in BCS-11)
 - not done by DMS-10

- unanswered call recording indication in study field, unless call qualifies for high runner compression.
- Switch Supervisory Unit (SSU) must be recorded for unanswered calls.
- Already implemented by C0505 for trunk id's.
- May be required in future for lines.

High Revenue Calls Only

- Optional recording only of certain call types specified by Operating Telephone Company.
- Intended for emergency use only, e.g. failure of any part of AMA system, such as disk drive or tape drives.
- Not done by DMS-10.
- Remote activation and automatic deactivation not within scope of this feature.
- Manual activation and deactivation will be provided, scheduled through Table AMAOPTS. This table provides periodic logs indicating which AMA options are activated, and other precautions can be taken to ensure that this option does not remain activated long after the emergency is over (e.g. a time limit on activation).

Free Terminating Calls

- AMA data required for calls within the same office terminating on FNT lines.
- This was not done by DMS-10.

STUDIES

- Studies require generation of AMA data or modification of normally generated AMA data.
- Study indication included in study field or service observed/traffic sampled field.
- If study requires detailed AMA data for a call which is normally bulk billed, the call type is not changed because of the study. This applies to Call Types 002 (Message Rate, Timed, MBI) and 004 (Message Rate, Untimed, MBI).
- Data Generated solely for studies include a study generated record indicator in the study field.
- Studies for which AMA data was produced by DMS-10 were:
 - Complaint Observing
 - Subscriber Line Usage Studies (SLUS)
- Due to lack of information on the precise nature of AT&T Studies, BNR will make any assumptions necessary to produce AMA data in the required format, until and unless more information becomes available. Some of these assumptions are included in the following discussion of individual studies. Assumptions will be defined fully in the Design Description (DD) section of this document, to be completed around the time of development close.

Service Evaluation

- This is equivalent to DMS-100 Service Analysis.
 - Calls are sampled and presented to a Service Analysis position if they meet certain criteria specified by the analyst.
 - This is not equivalent to full-time observation of specified individual lines, sometimes called service observing. DMS-100 does not support service observing.
- AMA data generated for each service-analyzed call, both answered and unanswered.
- "Service observed" indication in "service observed/traffic sampled" field. (Note that "service observed" means "service analyzed" in DMS-100.)

Complaint Observing

- This is equivalent to the CDR option on lines.
- Detailed AMA generated for each answered and unanswered call which would normally produce AMA data, including those which are normally bulk billed (call type does not change).
- Note that this includes terminating calls to these lines.

Traffic Sampling

- Coin calls are sampled for division of revenue and tax determination.
- **This is not currently implemented in DMS-100 and is not within the scope of BCS-11.**
- Assigned by line class or SSU.
- Detailed AMA data generated for each sampled answered and unanswered call.
- Traffic sampled indication in service observed/traffic sampled field.

Subscriber Line Usage Studies (SLUS)

- Assigned on a per line basis or for an entire line module.
- AMA options
 - originating & terminating calls
 - originating calls only
 - terminating calls only
- Detailed AMA data for answered and unanswered calls, and calls to busy lines.
- Terminating calls are recorded as SLUS Terminating Call Type 036.
- Terminating calls to busy lines are accumulated and recorded daily as SLUS Overflow Count Call Type 037.
- Terminating calls were not recorded by DMS-10.

- AMA recording of SLUS calls in the AT&T format will not change the basic philosophy or implementation of SLUS in DMS-100.

Point-to-Point (PTP) Traffic Data Sampling

- SSU's to be sampled and sampling rate user-specified.
- Detailed AMA data, required for each answered and unanswered PTP sampled call.
- This is not currently implemented in DMS-100 and is not within the scope of BCS-11.

Network Completion Studies

- Network completion data obtained from analysis of AMA data.
- Requires AMA data for unanswered toll calls (see "Unanswered Calls" on page 2003, and -- Heading id 'Options' unknown --).

SWITCH SUPERVISORY UNIT (SSU) IDENTIFICATION

- Format defined for trunks by C0505.
- Can also be recorded for lines if required.
- Options:
 - all answered calls (already provided by R0378).
 - answered toll calls.
 - answered local calls with specification of call types.

SHORT SUPERVISORY TRANSITIONS (SST'S)

- Optional recording of SST's already scheduled through AMAOPTS Table (R0378)
- Defined as:
 - (i) called party off-hook for more than 100ms

and less than minimum chargeable duration, or
(ii) calling party disconnect after called party
off-hook, and before minimum chargeable
duration,
prior to recognition of answer and during timed release disconnect inter-
val (see -- Heading id 'Timing' unknown --). The minimum chargeable dura-
tion (MCD) is an office parameter whose value is typically 2 seconds.

- Already detected on CAMA trunks (C0504).
- **If required for interlocal trunks or lines, this must be a separate fea-
ture, since it will require modification of PM execs.**
- Recorded as Signalling Irregularities Call Type 034.
- Also generates a separate call record of the appropriate type, with
study generated record indicator if this record is created only because an
SST occurred.
- If multiple SST's occur in one call only the first 16 are recorded.

TEST CALLS

- Recording of test calls is optional on an office basis.
- Test call indication in study field.
- This was not done by DMS-10.
- Test calls will be defined as calls originating from test positions and
calls generated by automatic test programs (e.g. DTSR). Incoming calls to
test lines will be excluded from this definition.

VALIDATION TESTS

- During validation of a new AMA recording arrangement, data generated by
the new arrangement includes a validation test indication in the study
field. This does not apply to DMS-100, since when cutover occurs there is
only one source of AMA data.

TIMING

- AMA Timing is described in DMS-200 Technical Specification, Section 6.2.5.
- Calling party disconnect occurs when the calling party loses control of the holding of the connection. This occurs when:
 - (a) the calling party goes on-hook, and the flash timing interval expires, for lines to which it applies.
 - (b) the timed release disconnect (TRD) interval expires after the called party goes on-hook. This is typically 10 to 12 seconds.
- The flash timing interval is not chargeable unless a flash occurs, causing a request for further service.
- Seizure and release times for three-way conference connections are defined as follows:
 - seizure time is defined as the answer time of the added-on connection (second leg of the call).
 - release time is defined as the disconnect time of the first party to disconnect from the three-way call.

LONG DURATION CALLS

The method used by R0378 (auditing active CCB's) will work equally well for local calls. This audit sends a "midnight message" to the call process associated with the CCB. This message must be handled appropriately in all relevant recall processors (for an example, see the SuperCama Trunk Recall Processor, module SCTRPR).

Long duration call forwarding activation reports will require an audit of the CFW and CFX tables. All required processing, including generation of AMA records, will be done by the audit process.

ABNORMAL INPUTS

Treatment of calls with abnormal inputs will be the same as C0505 (see DMS-200 Technical Specification, Section 6.2.4.7.). No substitution of fill characters will be done. This will not cause problems at the downstream processor, since data type checking is implicit in DMS-100.

Calls with No Disconnect Message

If a warm restart occurs after the answer message is received, the difference between answer and restart times is recorded as call duration. Since the true disconnect time is unknown, a charge guard indicator is included in the timing indicator field.

If no restart has occurred, the elapsed time is set to zero, and a single time line indicator is included in the timing indicator field.

Calls with No Answer Message

If a disconnect message is received with no corresponding answer message, no data is recorded for the call.

Note that AMA recording does not apply to IBN trunks which do not return answer. Station Message Detail Recording (SMDR - IBN feature) records any required billing information for these trunks.

CALL ASSEMBLY COUNTS AND TRACER RECORDS

Call assembly counts and tracer records will be an extension of those provided by C0505 (see DMS-200 Technical Specification, Section 6.2.4.8 through 6.2.4.10, and "OM Peg Counts and Tracer Records (R0378)" on page 1994). All counts will be pegged for local calls as well as toll. The count of unanswered calls will correspond to the type of unanswered calls being recorded (see -- Heading id 'Options' unknown --).

AT&T LOCAL AMA OPTIONS

The following options will be scheduled through Table AMAOPTS :

1. Local Coin Service (see "Local Coin Service" on page 1999)
 - record selected coin lines, or all coin lines
2. INWATS (see "INWATS" on page 2000)
 - scheduling of overflow count report - daily or as required
3. Unanswered calls (see "Unanswered Calls" on page 2003)
 - Unanswered local, with specified call types³
 - Unanswered toll
 - All unanswered calls.
4. High revenue calls only, with specified call types² (see "High Revenue Calls Only" on page 2004)
5. Recording of free number terminating calls (see "Free Terminating Calls" on page 2004)
6. SLUS (see "Subscriber Line Usage Studies (SLUS)" on page 2006)
 - orig & term
 - orig only
 - term only
 - frequency of SLUS overflow - daily or as required
7. Recording of SSU's (see "Switch Supervisory Unit (SSU) Identification" on page 2007)
 - all answered calls
 - answered toll calls
 - answered local calls, with specified call types³
8. Recording of test calls (see "Test Calls" on page 2008)

Message rate options (detailed vs. bulk billing, timing, message registers and MBI's) will be activated as described in documentation for Feature R0440 (Multi-Unit Message Rate Service).

A new option will be required in Table CUSTGRP for Customer Identification (discussed under "Customer Identification (CI)" on page 2003). The Customer Identification feature will also require additional data to assign identifiers to individual SPB lines and Attendant Consoles.

³ These options may require separate tables for specification of sets of call types.

The CDAR feature (discussed under "Customer Dialed Account Recording (CDAR)" on page 2002) will be implied whenever IBN lines use the Account Code feature on AMA calls.

PRIORITIES ASSIGNED TO LOCAL AMA FEATURES

The following priorities were assigned through group discussion at the DID Review for this feature, held on August 26-27, 1982. As a result of this assignment of priorities, the feature may be broken down into sub-features for BCS-11 and beyond.

Some facts affecting the assignment of priorities :

* The stated intent of this feature is to produce the same subset of the requirement as was done by DMS-10.

* There are no IBN/AT&T switches to be delivered in the BCS-11 time frame.

* The ESN package is scheduled for delivery in BCS-12.

* Some items require moderate development (Priority 4), and some require extensive development (Priority 5).

At the present time, the priorities are as follows :

PRIORITY 1 : REQUIRED IN BCS-11

This category is identical to the DMS-10 subset. There is no sub-prioritization of items in this category. The call types to be recorded are :

- 001 Detailed Message Rate, Timed, MBI
- 002 Message Rate, Timed, MBI
- 003 Detailed Message Rate, Untimed, MBI
- 004 Message Rate, Untimed, With MBI
- 005 Detailed Message Rate, Timed, No MBI
- 006 Station Paid
- 008 INWATS, Terminating Entry
- 009 Directory Assistance (411)
- 033 Directory Assistance (555)
- 034 Signaling Irregularities (CAMA trunks only)

- 042 Time Change (required in Local, but not in Toll)
- 067 Flat Rate
- 068 WATS (Billing number)
- 071 INWATS Overflow Count
- 090 Sensor Tracer
- 092 Sensor/RAO Tracer

The data to be recorded for the above call types includes service feature indicators, timing indicators, long duration calls, and Switch Supervisory Units (SSU's) for trunks as described in the LSSGR.

In addition to the above call types, SLUS (originating calls only) and Complaint Observing will be implemented, since these studies were provided by DMS-10 (discussed under "Studies" on page 2005).

PRIORITY 2 : WANTED BUT NOT ESSENTIAL IN BCS-11

This category is sub-prioritized in order of urgency combined with ease of implementation.

Priority 2.1

* Unanswered call recording option for local and toll calls (discussed under "Unanswered Calls" on page 2003).

* High runner call data compression for all applicable call types (discussed under "AMA Recording in AT&T Format (C0505)" on page 1993, and LSSGR Section 8.1.4.5).

Priority 2.2

* Call Types :

- 036 SLUS, Terminating Entry
- 037 SLUS, Overflow Counts

- 034 Signaling Irregularities (for trunks carrying chargeable calls)
- SST recording and detection for trunks carrying chargeable calls (discussed under "Short Supervisory Transitions (SST's)" on page 2007).

Priority 2.3

* Call Types :

- 026 Conference Trunk Usage
- 031 Call Forwarding Activation
- 041 Local Coin
- 074 Free Call

* Remote Call Forwarding (discussed under "Remote Call Forwarding (RCF)" on page 2001).

Priority 2.4

* Customer Dialed Account Recording (discussed under "Customer Dialed Account Recording (CDAR)" on page 2002).

* Customer Identification (discussed under "Customer Identification (CI)" on page 2003).

PRIORITY 3 - WANTED IN FUTURE BCS

* Call Types :

- 007 WATS (Station billing number)
- 011 FX, Automatic Flexible Routing
- 030 WATS, Automatic Flexible Routing to WATS
- 069 WATS AFR to DDD

* Call Forwarding Activation - Long Duration (discussed under "Long Duration Calls" on page 2009).

- * Switch Supervisory Unit (SSU) for lines (discussed under "Switch Supervisory Unit (SSU) Identification" on page 2007).
- * Service Evaluation (discussed under "Studies" on page 2005).
- * Network Completion (discussed under "Studies" on page 2005).
- * High Revenue Calls Only (discussed under "High Revenue Calls Only" on page 2004).

PRIORITY 4 - WANTED IN FUTURE BCS

- * Message Register Not Stroked Indicator (discussed under "Hotel/Motel (H/M) Message Rate Service" on page 1999).
- * Short Supervisory Transitions (SST's) for calls terminating on lines (discussed under "Short Supervisory Transitions (SST's)" on page 2007).

PRIORITY 5 - NEW FEATURES - EXTENSIVE DEVELOPMENT REQUIRED

- * OUTWATS FBD/MT Indicator (discussed under "OUTWATS" on page 2000).
- * Usage Sensitive Features (discussed under "Vertical Services (Custom Calling Features)" on page 2000).
- * Automatic Identified Outward Dialling (AIOD) (discussed under "Automatic Identified Outward Dialling (AIOD)" on page 2002).
- * Traffic Sampling (discussed under "Studies" on page 2005).
- * Point-to-Point Traffic Sampling (discussed under "Point-to-Point (PTP) Traffic Data Sampling" on page 2007).
- * Test Calls (discussed under "Test Calls" on page 2008).

Package NTX159AA06 BELLCORE LAMA FORMAT

Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	IBN COMPATIBILITY WITH ATT LAMA FORMAT AND MUMR
Feature no	F2512

FEATURE DESCRIPTION

The basic purpose of this feature is to provide IBN originating calls with the same AT&T lama recording capabilities that currently exist for POTS originating calls. It should be noted at this time that Station Message Detail Recording (SMDR) is unaffected by this feature. AT&T LAMA recording will be provided independent of SMDR recording. For AT&T Bell Operating Company (BOC) customers, SMDR will be provided using NT AMA format. Hence separate AMA streams (tapes) will be required for such customers.

Specifically, the enhancements which will be provided by this feature are as follows:

- 1) AT&T format billing records will be produced for IBN originating calls with call type direct dialed (DD), to which AMA billing (long distance charges) would normally apply.
- 2) Calls which originate from an IBN line and which terminate to directory assistance (555-1212 or 411) will produce an AT&T billing record identical to the record which is produced for a POTS-Directory Assistance call (See LSSGR Section 8.1.1.10)

It should be noted that the checking for directory assistance checking will be accomplished based on address digits (digits dialed) after an internally set prefix fence. Hence under certain conditions, not all directory assistance terminating calls will be recorded. For example by if an office only receives the digits '1 1' on '4 1 1' tandem calls, this call will be missed by the AT&T LAMA recording system.

It should also be noted that NPA-555-1212 calls are considered to be DD type calls, and are treated as such for the purposes of LAMA recording.

- 3) Calls which originate from an IBN line and to which LAMA recording applies will have AT&T long duration records produced in accordance with the conditions outlined in the LSSGR Section 8.1.3.2 (Treatment of Long Duration Calls).
- 4) IBN originating calls which have the line option Lcdr (local call detail recording) and will produce an AT&T billing record similar to that which is produced for an originating call from a POTS line with the Lcdr line option (call code 67). (See LSSGR section 8.1.1.2 Flat Rate Service Plan).

It should be noted that a separate line option SMDR will be created to produce SMDR records for IBN originating lines. This new line option will be identical in function to the Lcdr option which has been used in the past for IBN customers. As a result of this change the option Lcdr will have an identical meaning in both the POTS and IBN environments. Lcdr and SMDR line options will be independent of one another in that any combination of the two can be applied to an IBN line.

- 5) Multiunit Message Rate Service records will be produced for those IBN lines with MUMR option (See R0440 for description of MUMR). The calls for which MUMR recording will occur is totally up to the individual telco (via TABLE MUMRTAB). If the intent is to apply MUMR recording to IBN-POTS calls only, TABLE MUMRTAB should have an entry corresponding to the access code to reach the POTS environment from an IBN originating line ('9' in many cases).

It should be noted that the number of allowed message rate service areas (MRSA's) will be increased from a maximum of 64 to a maximum of 255. The intent here is to allow the assignment of a separate MRSA to every customer group within an IBN switch environment. This change will be realized via feature C0916 'BNR Changes For Line Data'.

- 6) Hotel/Motel Register Pulsing (HOTMOT) will be supported for IBN as a result of this feature. (See R0440 Multiunit Message Rate Services for a description of HOTMOT.)
- 7) ATTLAMA and ATTAMA OM Group pegs will be used for IBN originating/terminating calls in the same manner as for POTS calls.
- 8) AT&T AMA records will be provided for INWATS terminations to IBN lines. These records will be identical to the INWATS records currently being provided for in the POTS environment, with the exception that the terminating number in the AT&T record will contain the special billing number of the INWATS virtual facility group (VFG) on which the call is terminated on.

If no special billing number exists, the terminating number will contain the snpa & nxx of the INWATS dn and the last four digits dialed by the originator. It should be noted that a special billing number SHOULD ALWAYS be datafilled.

- 9) AT&T AMA records will be created for OUTWATS calls originating from an IBN line, in a similar fashion as is currently supported for POTS OUTWATS calls. The only difference in the IBN AT&T records will be that the originating dn will contain the virtual facility group (VFG) identifier, and not the originating directory number. 10) Three Way Calling usage records will be supported for IBN controlling lines. The records produced will be identical to

those currently produced for POTS controlling conference calls. (See C0683 design document for a description of conference usage recording.)

As a result of this feature this recording capability, for both IBN and POTS lines will be controlled via the parameter TWC in table AMAOPTS. It should be noted that six port conference usage recording for IBN will not be supported by this feature.

It should also be noted that the AMAB log messages produced for IBN controlling 3WC usage records will have the 'calling dn' field filled in with digits corresponding to the dialed digits of the 2nd leg of the conference call. This differs from POTS conference records. (For POTS AMAB logs we fill in the 10 digit number corresponding to the directory number of the second leg of the three way call.) The reason for the difference is to provide the telco with more information regarding the second leg of the three way call (for example, was the second leg of the conference call achieved via an INTRA-IBN path or via an IBN-POTS-IBN path.) Note that the calling directory number does not appear on the actual AMA record written to tape; hence the actual call records will be identical for both IBN and POTS controlling 3WC usage records.

- 11) AT&T Call Forwarding Usage Records will be optionally produced for all IBN originating customer activated CFX. This optionality will be achieved via a decision parameter CALL_FWD in table AMAOPTS. This option will also control call forwarding usage recording for POTS lines. (See C0683 design document for a description of call forwarding usage recording.) 12) For all records created for IBN lines with AT&T LAMA format the following fields:

Structure Code	Common Fields
Call Type	-----
Sensor Type	
Sensor Identification	
Recording Office Type	
Recording Office Identification	
Date	Billing & Statistical Fields
Timing Indicator	-----
Study Indicator (see note)	
Answer	
Service Observed, Traffic Sampled	
Operator Action	
Service Feature	
Originating NPA & Number	
Overseas Indicator	
Terminating NPA & Number	

Time
Elapsed Time
Circuit Time
Wats Indicator
Wats Band (See LSSGR Section 8.1.4.2 Field Structure)

will be filled in in an identical manner as is currently done with POTS calls.

- 13) The Studies which will be supported by this feature will be identical to those provided in the POTS environment at this time:

Subscriber Line Usage Study (LUS option)
Unanswered Call Recording (UNANSLCL, UNANS in TABLE AMAOPTS)
Complaint Observed Call Recording (OBS option)

It should be noted that LUS and OBS study fields will not be supported for IBN INWATS Terminating records and OUTWATS originating records. This is due to the difficulty in identifying individual line options after the line has gone through retranslation.

In other words, by the time an IBN originating call has reached the retranslation stage, the only information available is the calling and called number (either of which may have been altered via a previous retranslation). The originating cpid may not be available due to the possibility that the originating agent field in the CCB has been overwritten. For these reasons, any attempt to try to identify the true originator of the call would yield inconsistent results.

Specifically the enhancements which will not be provided by this feature are as follows:

- 1) Customer Dialed Account Recording (CDAR) is not currently supported in the POTS environment and hence will not be provided for IBN lines by this feature.
- 2) Customer Identification (CID) is not currently supported in the POTS environment and hence will not be provided for IBN lines by this feature.
- 3) Short Supervisory Transition (SST) AT&T AMA records are currently only supported for CAMA calls and hence will not be provided for line calls (including IBN line calls) at this time.
(See LSSGR Section 8.1.1.15B)

Package	NTX159AA06 BELLCORE LAMA FORMAT
Feature set	ADMINISTRATION
Feature	CALL CODE 009,003 & 121 ASSIGNMENT VIA TRANSLATION
Feature no	F2759

FEATURE SYNOPSIS

This feature adds AMA pretranslation table which gives the Telco the ability to specify, by datafill, the generation of call codes 009 (411 directory assistance), 033 (555 directory assistance), and 121 (datapath terminating access record) on a per translation basis.

FEATURE DESCRIPTION

Prior to this feature generation of Bellcore AMA records for DA calls 411 (call code 009) and 555 (call code 033) by turning of or off the corresponding parameters in AMAOPT table. This feature adds table AMAPRT, as a subtable of table STDPRTCT, which, when properly datafilled by Telco, will generate call codes 009 and 033 on a per translation basis. This feature also adds a new call code 121 (datapath terminating access record). Without AMA pretranslation this call could only be recorded as call code 119 (terminating access record).

This feature covers both POTS and IBN lines and supports the following trunk groups: SC, OC, ATC, P2, PX, IBNT1, IBNT2.

Ref: FDOC BR0759
LSSGR Section 8.1

Package	NTX159AA06 BELLCORE LAMA FORMAT
Feature set	SWITCHING AND TRANSLATIONS
Feature	DATAPATH AMA FORMAT-CALL CODES 072,117,121
Feature no	F2793

FEATURE SYNOPSIS

This feature allows DMS-100 to provide call codes 072 and 117 for datapath and interlata datapath calls respectively and output AMA (automatic message accounting) data as referenced in lata switching systems generic requirements (LSSGR), December 1984 version, Section 8.1 - Billing.

FEATURE DESCRIPTION

Call code 072 is required for datapath calls originated from a data unit. Call code 072 supports structure codes 00190 answered, 00191 unanswered, and 00194 long duration. Other structure codes 00192, 00193 and 00195 are not supported by this feature.

Call code 117 is required for equal access billing ie, generating originating local access and transport area (lata) access for datapath calls. Call code 117 supports structure codes 00645 interlata and 00647 interlata, long duration. Other structure codes 00646 and 00648 are not supported by this feature.

The call codes are activated automatically when a data unit originate a billable call, call code 072 replaces call code 006 for datapath calls made via the public switched network. Call code 117 replaces 110 for datapath calls made via the equal access network.

Ref:

BR0793

Package	NTX159AA06 BELLCORE LAMA FORMAT
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	BC AMA INTERLATER WATS CALL CODE III
Feature no	F5684

FEATURE SYNOPSIS

This feature allows DMS-100 to provide call code III (interLATA, WATS, station details).

FEATURE DESCRIPTION

Call code III (CC III) is required for equal access billing i.e., generating originating local access and transport area (LATA) access records. If a interlata carrier/international carrier (IC/INC) provide services such as outwats, the appropriate interLATA WATS record similar to the non-interLATA record is generated. The interLATA record is necessary because additional carrier connect details are included. This feature allows DMS-100 to provide CC III with no special treatment and output the appropriate AMA data.

Ref: BC1698
LSSGR 8.1 - Billing
NTP 297-1001-119 AMA Reference Manual

NTX165AA06 Status: RTM BELLCORE - IBN/ESN DETAIL RECORDING

ATT100 AND ATT200	:	
IBN/ESN CALLS IN BELLCORE AMA FORMAT		F2615
CCSA	:	
CCSA LINE OPTION		F2746
CCSA VFG OPTION		F2747
ATT100 AND ATT200	:	
BOC - AMA CALL CODE 032		F3959
BELLCORE AMA CALL CODES 085 AND 011		F5504
CUSTOMER DIALED ACCOUNT RECORDING		F5617
OPERATION	:	
BELLCORE AMA - ENHANCED ARS TRANSLATIONS		G0034

Package NTX165AA06 BELLCORE - IBN/ESN DETAIL RECORDING
 Feature set ATT100 AND ATT200
 Feature IBN/ESN CALLS IN BELLCORE AMA FORMAT
 Feature no F2615

FEATURE SYNOPSIS

This feature provides the following new call code recording capability for AT&T format local AMA recording:

- Call code 007 - WATS Station Detail Recording
- Call code 021 - CCSA Sampling

FEATURE DESCRIPTION

WATS Station Detail Recording:

This call type provides facility to generate AMA data for a WATS call. The data for WATS call is recorded and formatted as follows:

- Call code 068 if SPB (Special Billing Number) is provided.
- Call code 007 if no SPB (Special Billing Number) is provided.

	Call Recorded Line with SPB	Call Recorded Line without SPB
Outwats call VFG with SPB	call code 068	call code 068
Outwats call VFG without SPB	call code 007	call code 007

CCSA Sampling:

This call type provides details for a call routed over a Common Control Switching Arrangement (CCSA) facility via a "CCSA" trunk group.

This feature indicates call code 21 o be recorded rather than the unique indication of the event in "STUDY INDICATOR" field of AMA.

Package	NTX165AA06 BELLCORE - IBN/ESN DETAIL RECORDING
Feature set	CCSA
Feature	CCSA LINE OPTION
Feature no	F2746

FEATURE SYNOPSIS

This feature provides the telco with the capability of assigning a CCSA (common control switching arrangement) option to IBN (integrated business network) stations. The CCSA option is used for Belcore AMA (automatic message accounting) recording purposes to identify the station as being a member of CCSA network.

FEATURE DESCRIPTION

CCSA service provides private communications facilities between centrex and PBX (private branch exchange) customer locations. The assemblage and interconnection of these locations is what is referred to as a CCSA network.

Through the use of this feature a telco can designate specific IBN stations as being members of a CCSA network. Assigning the CCSA option to an IBN station will cause a detailed AMA record to be generated. This AMA record is uniquely identified with call code 021. An 021 AMA record is produced only when no other billing requirements exist for the call. CCSA option can only be assigned to IBN stations with line class code equal to IBN. LCDR (local call detail recording) and CCSA line options are incompatible.

Ref:

LSSGR Section 8.1 (Billing)

BR0746 FDOC

Package	NTX165AA06 BELLCORE - IBN/ESN DETAIL RECORDING
Feature set	CCSA
Feature	CCSA VFG OPTION
Feature no	F2747

FEATURE SYNOPSIS

This feature provides the telco with the capability of assigning a CCSA (common control switching arrangement) option to incoming IBN (integrated business network) VFGs (virtual facility groups). The CCSA option is used for Belcore AMA (automatic message accounting) recording purposes, to identify VFG as being a member of a CCSA network.

FEATURE DESCRIPTION

CCSA services provides private communications facilities between centrex and PBX (private branch exchange) customer locations. The assemblage and interconnection of these locations is what is referred to as CCSA network. Through the use of this feature a telco can designate specific incoming IBN VFGs as being members of a CCSA network. Each call which is routed through a VFG with the CCSA option will cause a detailed AMA record (for study purposes) to be generated. This AMA record is uniquely identified with call code 021. An 021 AMA record is produced only when no other billing requirements exist for the call. CCSA option takes precedence over CDR option if both are assigned to a VFG.

Ref:

LSSGR Section 8.1 (Billing)
BR0747 FDOC

Package	NTX165AA06 BELLCORE - IBN/ESN DETAIL RECORDING
Feature set	ATT100 AND ATT200
Feature	BOC - AMA CALL CODE 032
Feature no	F3959

FEATURE SYNOPSIS

This feature provides the capability to designate an IBN two way or IB outgoing trunk group as a CCSA facility or a TDMTT facility. This results in generation of the appropriately coded AMA record when calls are routed via these facilities.

FEATURE DESCRIPTION

The feature replaces the call characteristics vector 'callchr' with an option vector containing two fields, one for call characteristics and the other for special billing record designation.

For trunk groups designated as TDMTT, AMA data for calls routed over that facility are recorded with call code 032. A trunk group designated as CCSA has call code 021 recorded for AMA.

Ref: FDOC BC1386.

Package	NTX165AA06 BELLCORE - IBN/ESN DETAIL RECORDING
Feature set	ATT100 AND ATT200
Feature	BELLCORE AMA CALL CODES 085 AND 011
Feature no	F5504

BELLCORE AMA CALL CODES 085 AND 011 (F5504/BC1678)

FEATURE SYNOPSIS

This feature provides the following new call code recording capability for BC format local AMA (Automatic Message Accounting) recording.

- 1) Call Code 011 - FX, Automatic Flexible Routing
- 2) Call Code 085 - Electronic Tandem Switched call

This feature is an enhancement of the feature BOC AMA CALL CODE which provides the Telco with the capability of designating IBNT2 (IBN two way) or an IBNTO (IBN outgoing) trunk group as being either a Common Control Signalling Arrangement (CCSA) facility or Tandem Tie Trunk (TDMTT) facility.

FEATURE DESCRIPTION

This feature provides the capabilities of designating IBNT2 or IBNTO trunk group as being FX (Automatic Flexible Routing) facility or EST (Electronic Tandem Switched Call) facility. This can be done by data-filling OPTION field vector in groupinfo area refinements of table trkgrp with (SPCLBLG FX) or (SPCBLG ETS).

Any one of the following special billing OPTION can be designated.

CCSA	Common Control Signalling Facility
TDMTT	Tandem Tie Trunk Facility
FX	Automatic Flexible Routing Facility
ETS	Electronic Tandem Switched Call Facility

Only one of the above can be added as special billing option to the trunk group. Attempt to add more than one special billing option to the trunk group will result in processing error by table control software.

1. Call code 011 - FX, AUTOMATIC FLEXIBLE ROUTING

This call type provides details for a call routed over Automatic Flexible Routing (FX) facility via FX trunk group. IBNT2 (IBN two way) or IBNTO (IBN outgoing) trunk groups can be designated as FX facility.

2. Call Code 085 - ETS, Electronic Tandem Switched call.

This call type provides details for a call routed over an Electronic Tandem Switched Call facility (ETS) via ETS trunk group. IBNT2 (IBN two way) or IBNTO (IBN outgoing) trunk groups can be designated as ETS.

Package	NTX165AA06 BELLCORE - IBN/ESN DETAIL RECORDING
Feature set	ATT100 AND ATT200
Feature	CUSTOMER DIALED ACCOUNT RECORDING
Feature no	F5617

FEATURE SYNOPSIS

Customer dialed account recording (CDAR) is an enhancement to the existing account codes feature. That feature allows an account code to be entered into a station message detail recording (SMDR) record. The CDAR feature expands on this by allowing the same account code to be entered into a Bellcore (BC) format automatic message accounting (AMA) billing record.

FEATURE DESCRIPTION

An account code is used by Meridian Services station user typically for charge back purposes to various departments, clients etc.

Whenever an account code is entered for a call, the account codes feature forces an SMDR record to be produced. The CDAR feature however, does not force an AMA record to be produced. The account code is only captured by the AMA system if the call would normally produce an AMA billing record.

An account code can be entered at different stages of a call as follows:

1. Prior to dialing the called number. This is accomplished by first dialing the feature access code assigned to the account code feature, followed by the account code itself.
2. After dialing the called number when prompted with special dial tone. Prompting is based on the attributes of the customer group, the station user's network class of service (NCOS), and the translation of the called number.
3. During the talking stage. The station user may flash, dial the feature access code assigned to the account code feature, followed by the account code, and then flash to return to the talking stage.

Package	NTX165AA06 BELLCORE - IBN/ESN DETAIL RECORDING
Feature set	OPERATION
Feature	BELLCORE AMA - ENHANCED ARS TRANSLATIONS
Feature no	G0034

FEATURE SYNOPSIS

This feature changes the method of producing the Bellcore Automatic Message Accounting (AMA) Call Codes 011, 021, 032, and 085.

It also allows a new option, TOLLRST, to be added to a POTS Virtual Facility Group (VFG) and allows the POTS VFG option IBNPIC to override the Primary InterLATA Carrier (PIC) of the VFG even when the line to VFG part of the call is not an Equal Access (EA) call.

FEATURE DESCRIPTION

Changes to Bellcore AMA Records

An IBNT0 or IBNT2 trunk may be designated as a special facility by adding the option SPCLBLG and the type of billing desired to Table TRKGRP. With this feature, when a call terminates on an IBNT0 or IBNT2 trunk with the SPCLBLG option, an AMA record will be generated. The specific AMA record generated depends upon the type of special billing indicated by the SPCLBLG option.

New POTS VFG Option

Through IBN translations, the restrictions Toll Denial (TDN) or Toll Diversion (TDV) may be applied. Toll Denial restricts an originator from making toll calls. Toll Diversion diverts the originator's toll calls to the attendant.

Translation for calls through VFGs is done in two legs: the first leg is from the IBN station to the incoming side of the VFG, and the second leg is from the outgoing side of the VFG to the terminator.

The POTS VFG option TOLLRST allows the toll restriction imposed on the first leg of the translation to be carried through to the second leg of the translation.

Changes to POTS VFG IBNPIC Option

When the IBNPIC option is present, the Primary InterLATA Carrier information from the first leg of translation is also used for the second leg.

Ref: FDOC AF1234

NTX167AB04 Status: RTM CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)

SERVICE	:	
CCS7 INDN USER PART		F5670
SERVICES	:	
ISUP TTP ENHANCEMENTS		F5839
ISUP GROUP MESSAGE HANDLING		F5840
ISUP TOLL SIGNALLING		F5841
INTERWORKING - ISUP TO TOPS		F5842
ISUP TANDEM CALL		F5843
ISUP TEST LINES TL100,TL102		F5844
ISUP CONTINUITY TEST		F6043
LOOP AROUND TRUNK FOR ISUP TO POTS LINE		F6044
ISUP SUPERVISION ENHANCEMENT		F6046
ISUP - FPE ENHANCEMENT TO HANDLE ISUP		F6271
ISUP TESTLINE ENHANCEMENTS		F6272
ISUP/POTS LINES INTERWORKING		F6273
ISUP 105 TESTLINE		F6414
ISUP MDC INTERWORKING		F6415
INTERWORKING	:	
ISDN-UP ACCESS TO CONSOLE VIA LOOPBACK TRUNK		F6458
ISDN-UP MDC FEATURE VIA LOOP-AROUND TRUNKS		F6459
ENHANCEMENTS	:	
LOOPBACK REDUCTION FOR ISUP/AC		F6652
INTERWORKING	:	
ISUP PBX TRUNK INTERWORKING		F6653
ADMINISTRATION	:	
OPERATIONAL MEASUREMENTS		F6654
PRODUCTS	:	
ISUP PROTOCOL VERSION CONTROL		F6959
ENHANCEMENT	:	
ISUP TRUNKS TO ATTENDANT CONSOLE INTERWORKING		F7086

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICE
Feature	CCS7 INDN USER PART
Feature no	F5670

FEATURE SYNOPSIS

This feature is the implementation of the integrated services digital network (ISDN) user part call processing and ISDN trunk maintenance.

FEATURE DESCRIPTION

This feature, CCS7 IDND user part (ISUP), defined by the T1X1.1 specification uses the CCS7 signalling system to provide enhanced trunk 'call processing capabilities to the North American market. It combines the advantages of faster call set up times and shorter call holding times on unsuccessful call attempts with the ability to carry both voice and data.

This feature is the BCS-20 offering of the ISDN user part as specified in the CCS7 product spec. This includes the necessary call processing, DMS maintenance, MMI, data schema, logs and OMs for ISUP inter-local trunk to trunk functionality only. The BCS-20 releasable features are:

- ISUP Maintenance System:

This feature provides for ISUP maintenance that is necessary to support ISUP call processing. It also provides the interface to basic DMS maintenance facilities.

- ISUP User Part Interlocal:

This is a partial implementation of the ISDN user part to provide interlocal and intertoll functionality in this BCS-20. The ISDN trunk will only be connecting to other local trunks and not to POTS or feature lines in this BCS. In further BCS deliveries the additional functionality will be provided.

- ISUP Table Operations:

This feature provides the ability to datafill ISUP trunks.

References:

FDOCs:

BV1998
BC2108
BC2109
BF0654

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP TTP ENHANCEMENTS
Feature no	F5839

FEATURE SYNOPSIS

This feature provides a new TTP sublevel for CCS7. This level will contain three new commands for queries and tests on CCS7 trunks.

FEATURE DESCRIPTION

This feature provides a new MMI level for ISUP trunks. It contains CCS7 specific commands for use on CCS7-ISUP trunks to do maintenance functions. The following commands are included in the CCS7 TTP sublevel:

1. ROUTESET

This command will display the routeset name for the currently posted trunk.

2. SIGQRY (Signalling Query)

This command displays the availability of a signalling path for the currently posted trunk based on the status of both internal (DMS) and CCS7 MTP and ISUP availability. This command is useful when a trunk is in the lockout (LO) state for determining the cause of the signalling problem(s).

3. TRKQRY (Trunk Query)

The TRKQRY command deals with state of the posted trunk. Three options are available:

Local - displays the current local CCS7 state of the posted trunk.

Remote - displays the far end CCS7 state of the posted trunk (uses the circuit query message).

(no parms) - displays both the local and far end CCS7 states of the posted trunk. If they are not compatible, the user will be shown what action(s) are required to fix it and will be prompted for a decision whether or not to take action. The set of actions is a set of the following:

- (1) send a blocking message
- (2) send release circuit message
- (3) send an unblocking message
- (4) mark remotely blocked
- (5) clear remotely blocked
- (6) set call processing to the idle state
- (7) mark ISUP far end unequipped and put to lockout state.

Ref: DDOC BC2318

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP GROUP MESSAGE HANDLING
Feature no	F5840

FEATURE SYNOPSIS

This feature implements the handling of maintenance group messages (blocking, unblocking, reset circuit) as described in the CCITT/ANSI Q.764 specifications.

FEATURE DESCRIPTION

This feature enhances the ISUP Maintenance System by reducing the traffic of maintenance messages between exchanges.

The function of the ISUP Maintenance System are:

- provide system and manual maintenance for ISUP trunks,
- support ISUP call processing (i.e., make ISUP trunks available).

The enhancements implemented by this feature allow the ISUP Maintenance System to send out and handle group messages (each group message will contain between 2 and 24 circuits), as well as single messages.

The group messages are for circuit blocking, circuit unblocking, and circuit reset, and their acknowledgements. This feature does not implement the sending of group blocking/unblocking messages and the reception of group blocking/unblocking acknowledgement (Ack) messages, since the ability to generate group blocking/unblocking from the MAP has not been determined to be useful to the craftsperson.

The sending and reception of group reset circuit message are implemented by this feature.

Ref: FDOC BC2319

Package NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set SERVICES
Feature ISUP TOLL SIGNALLING
Feature no F5841

FEATURE SYNOPSIS

This feature provides interworking between ISUP and toll access trunk, toll completing trunks, and intertoll trunks.

FEATURE DESCRIPTION

This feature provides interworking between ISUP and toll access, toll completing and intertoll trunks. This feature will provide the following call types:

ORIGINATOR TERMINATION

PTS local	ISUP intertoll
PTS toll access	ISUP intertoll
PTS intertoll	ISUP toll completing
PTS intertoll	ISUP intertoll
ISUP toll access	PTS intertoll
ISUP intertoll	PTS intertoll
ISUP intertoll	PTS toll completing
Supercama (toll connecting)	ISUP intertoll

This feature does not support ISUP as CAMA and therefore provides no spilling function for ISUP trunks. ISUP as CAMA will be completed in a later BCS.

Ref: FDOC BC2320

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	INTERWORKING - ISUP TO TOPS
Feature no	F5842

FEATURE SYNOPSIS

This feature provides an interworking between the CCS7 ISUP Intertoll trunk (IT) and the DMS TOPS and AOSS position.

FEATURE DESCRIPTION

This feature provides an interworking between the Common Channel Signaling System #7 ISUP IT trunks and the DMS TOPS and AOSS position. This feature allows the following:

1. Call incoming to a TOPS/AOSS position iva ISUP IT trunk.
2. Call outgoing from a TOPS position via IT trunks.

Ref: FDOC BC2321

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP TANDEM CALL
Feature no	F5843

FEATURE SYNOPSIS

This feature provides the ability to make ISUP to ISUP calls by allowing ISUP trunks to be connected in tandem.

FEATURE DESCRIPTION

This feature supports the following messages which are part of CCS7 Protocol as defined by the American National Standards Institute (ANSI) Specification Q.764:

- Initial Address Message (IAM)
- nature of connection indicators
- forward call indicators
- calling party category
- bearer capability
- called party address
- remaining parameters

- Address Complete Message (ACM)

- Answer Message (ANM)

- Release (RLS) Message

- Release Complete (RLC) Message

- Suspend (SUS) Message

- Resume (RES) Message

- Forward Transfer (FOT) Message

Other messages described in the ANSI Q.764 specification are not supported by this feature.

Ref: FDOC BC2322

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP TEST LINES TL100,TL102
Feature no	F5844

FEATURE SYNOPSIS

This feature enables currently existing Testline Tests T100 and T102 to be used on ISUP trunks. In addition, the feature also provides outpulsing (OP) capabilities on ISUP trunks.

FEATURE DESCRIPTION

Testline tests are manual/automatic trunk tests requiring no human intervention at the adjacent office.

The following tests, which are necessary to properly commission an office, is provided for use on ISUP trunks:

- T100 - Balance Termination Testline
- T102 - Milliwat Testline

This feature facilitates the use of two Trunk Test Position (TTP) MAP level commands, as well as Automatic Trunk Test (ATT) system trunk testing (where available) on ISUP trunks. Both are achieved by providing test call software for ISUP trunks.

Two TTP commands that utilize test call software are:

1. TST : Execute testline tests T100 and T102.
2. OLP : Initiates a call under TTP control.

The standard testline interface is utilized for ISUP trunks. Tests may be initiated from a MAP or they may be executed automatically from the ATT system.

Ref: FDOC BC2323

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP CONTINUITY TEST
Feature no	F6043

FEATURE SYNOPSIS

This feature provides continuity check on the ISUP trunk. It implements the continuity checking procedures as defined in the TIXI.1 (Apr 1985) specification of the ISUP. Demand continuity rechecking procedure is not supported by this feature since the test is initiated by a craftsman at the MAP and he/she should be in charge of the trunk.

FEATURE DESCRIPTION

Due to the nature of the CCS7 signalling, the call set up signalling is not transmitted on the ISUP voice facility itself. Hence, the quality of the voice connection is insured. It is not necessary to perform continuity checking on digital trunks due to the internal carrier maintenance. It is however, desirable on analog trunks. Continuity testing is done by connecting a tone and a receiver to the originating end and cause the tone to be looped back at the terminating end. The originator checks the validity of the tone. If the tone passes then voice may be connected. If not, reattempt on another trunk should occur.

Ref: DDOC AC0046

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	LOOP AROUND TRUNK FOR ISUP TO POTS LINE
Feature no	F6044

FEATURE SYNOPSIS

This feature provides automatic access to loopback trunks for situations where direct interworking between ISUP trunks and other agents in a call is not possible.

FEATURE DESCRIPTION

This feature provides a means of identifying loopback trunks in a DMS office such that they may be selected to terminate calls in situations which cannot be handled using existing call processing capabilities.

The initial application of this feature is to provide an interface between CCS7ISUP trunks and POTS extended lines.

This feature is intended only as a temporary measure. As call processing software evolves to handle interworking between ISUP trunks and other types of call agents, this loopback trunk feature will no longer be required.

Ref: DDOC AC0078

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP SUPERVISION ENHANCEMENT
Feature no	F6046

FEATURE SYNOPSIS

This feature is an internal enhancement feature to enhance the ISUP supervision to allow future call types to be interworked with ISUP trunks with as little development on the ISUP side as possible.

FEATURE DESCRIPTION

The purpose of this feature is to enhance the current ISUP supervision method so that future call interworkings can be easily supported without too much extra development. Its function is to inform the peripheral of all the necessary actions to take in the case of call events, and to allow the peripheral to react appropriately to this information in the correct circumstances.

This feature provides backwards compatibility with the existing supervision, while continuing to support the current call types available. These are:

- ISUP local/intertoll trunk with PTS trunk
- ISUP local trunk with POTS line
- ISUP local/intertoll trunk with TOPS position
- ISUP intertoll trunk with supercama/tops/AMR5 trunk
- ISUP trunk to ISUP trunk (local and toll)
- ISUP AUTOVON trunks
- ISUP 250 trunks
- ISUP MTC TTP level commands

Ref: FDOC AC0080

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP - FPE ENHANCEMENT TO HANDLE ISUP
Feature no	F6271

FEATURE SYNOPSIS

This feature enhances the FPE to support ISUP trunks. FPE networking utilities and their supporting software are enhanced to generate supervision messages in the new style employed by ISUP trunks.

FEATURE DESCRIPTION

The introducing of CCS7 ISUP trunks into DMS-100 requires that two aspects of the Feature Processing Environment (FPE) be enhanced:

1. CCS7 ISUP trunks require new forms of messages from the Central Control. When CC call processing (including custom calling features) needs to control the supervision of CCS7 ISUP trunks.
2. CCS7 ISUP trunks are capable of sending to the CC new messages which have no equivalent in POTS trunk. These messages must be handled by the FPE base software and by certain custom calling features.

Ref: DDOC AC0112

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP TESTLINE ENHANCEMENTS
Feature no	F6272

FEATURE SYNOPSIS

This feature is to extend the ISUP testline coverage to T100, T101, T102, T104 and T108 (i.e., add T101, T104 and T108).

FEATURE DESCRIPTION

Test line tests are manual/automatic trunk tests requiring no human intervention at the adjacent office. Due to the high level of cooperation between the adjacent offices performing tests of this nature, a number of standard tests have been established along with specific signalling protocols to support these tests.

ISUP trunks use CCS7 for all signalling requirements. The ISUP/CCS7 message based protocol contains specific details on how to handle test line tests for ISUP trunks. The purpose of this feature is to add test lines 101, 104 and 108 to the list of available test lines for ISUP trunks. These test lines will operate in the same way as the current test lines do for other trunk types.

Ref: DDOC AC0120

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP/POTS LINES INTERWORKING
Feature no	F6273

FEATURE SYNOPSIS

This feature allows extended POTS lines (with the exception of features such as 3WC) to be connected to ISUP trunks directly without the use of loopback trunks.

FEATURE DESCRIPTION

This feature provides the capability to connect extended POTS lines directly to ISUP trunks, and to connect ISUP trunks directly to extended POTS lines, with a few exceptions as follows:

- 3WC - three way calling
- CSDDS - circuit switched digital data service coin lines with local coin overtime(LCO) feature active
- originating POTS line with the AIOD option
- terminating POTS line with free number termination (FNT)
- terminating POTS ESL (emergency service line) line
- terminating POTS ESB (emergency service bureau) trunk.

Where the line cannot directly interwork with ISUP, a loopback trunk is required between the two.

Ref: DDOC AC0121

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP 105 TESTLINE
Feature no	F6414

FEATURE SYNOPSIS

This activity extends the ISUP testline coverage to T105, including ROTL and TTP i/f.

FEATURE DESCRIPTION

Test line tests are manual/automatic trunk tests requiring no human intervention at the adjacent office. Due to the high level of cooperation required between adjacent switches performing tests of this nature, a number of standard tests have been established along with signalling specific protocols to support these tests.

ISUP trunks use CCS7 (common channel signaling #7) for all signalling requirements. The ISUP/CCS7 message based protocol contains specific details on how to handle test line tests for ISUP trunks. The purpose of this feature is to add test line 105 to the list of available test lines for ISUP trunks as well as to provide Remote Office Test Line (ROTL) access to ISUP trunks. The T105 testline will operate in the same way as the current test lines do for other trunk types.

Ref: AC0199

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	SERVICES
Feature	ISUP MDC INTERWORKING
Feature no	F6415

FEATURE SYNOPSIS

This feature is one of a group of three features whose goal is to allow ISUP (ISDN User Part) trunks greater functionality in the IBN feature environment. This activity allows ISUP trunks to connect directly to IBN lines with the following features: CFD, Call Hold, Perm Hold, Call Park, CPU, MADN, CONF6, Preset Conf., EBO, DCPU, and 3WC. This feature also allows ISUP trunks to access the following IBN features: ACD, UCD, DISA and Meet Me Conference. Loopback trunk may be used.

FEATURE DESCRIPTION

This feature provides a direct interworking between ISUP trunks and the following IBN features :

- Call Forward Don't Answer (CFD)
- Call Hold (CHD)
- Permanent Hold (PHOLD)
- Call Park (PRK)
- Call Pickup (CPU)
- Trunk Answer From Any Station (TAFAS)
- Multiple Appearance Directory Number (MADN)
- Flexible Station Controlled Conference (CONF6)
- Preset Conference
- Three Way Calling
- Call Transfer
- Directed Call Pickup
- Directed Call Pickup with Barge-in
- Executive Busy Override

Previously, ISUP interworking with the listed IBN features was provided by Loopback trunks. This feature removes this restriction.

Note: "Three Way Calling (3WC)", throughout this document refers to NEW 3WC as implemented by features BC2023 "3 Way Call/FPE Compatability" and BR0800 "3 Way Call Chaining". Direct ISUP interworking to OLD 3WC is not provided by this feature and therefore OLD 3WC/ISUP interworking will still require the use of Loopback trunks.

This feature also allows ISUP trunks to access the following features:

ACD - Automatic Call Distribution

UCD - Uniform Call Distribution

DISA - Direct Inward System Access

Meetme Conference

For these four features, ISUP trunks are used only as they are currently implemented as standard POTS trunks. The same restrictions which apply to POTS trunks and their interactions with these IBN features apply to ISUP trunks. Also, any interactions and restrictions which apply to these IBN features are unchanged by their interworking with ISUP trunks.

This feature is concerned only with the interworking between ISUP trunks and the above four specified IBN features and does not deal with any ISUP/IBN networking issues.

Ref: AC0249

AC0250

AC0251

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	INTERWORKING
Feature	ISDN-UP ACCESS TO CONSOLE VIA LOOPBACK TRUNK
Feature no	F6458

FEATURE SYNOPSIS

This feature provides the capability to interwork ISDN User Part (ISUP) trunks and IBN Attendant Consoles indirectly, through the use of loopback (LPBK) trunks.

FEATURE DESCRIPTION

This feature provides ISUP trunks with the capability of interworking with an IBN Attendant Console via loopback trunks.

Specifically, it will enable calls incoming on ISUP trunks to terminate on an Attendant Console and vice versa. This feature will use loopback trunks assigned to trunk groups having a group type LPBK. The selection and insertion will be fully automatic and transparent to all parties.

For calls originating from an ISUP trunk the common language name (CLLI), and if available, the calling parties address will be displayed on the console. If an SMDR is generated on an Attendant Console to ISUP trunk, the loopback trunk will appear as the terminating agent.

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	INTERWORKING
Feature	ISDN-UP MDC FEATURE VIA LOOP-AROUND TRUNKS
Feature no	F6459

FEATURE SYNOPSIS

This feature allows IBN lines to interwork with ISUP trunks via looparound trunks when one of a selected group of IBN features is about to be instigated from the IBN line.

FEATURE DESCRIPTION

Current implementation of the IBN/ISUP interworking makes use of the loopback trunk extensively. If the IBN line does not have any incompatible features assigned, it is allowed to connect directly to the ISUP trunk.

If the IBN line has at least one incompatible feature assigned, ie, one that cannot interwork with ISUP trunk directly. This feature will provide loopback on demand (LBD) capability to interwork ISUP trunk with some of the incompatible IBN line features.

Note that this feature does not deal with certain IBN features such as attendant, ACD, EBO, meet me conference, preset conference. These exceptions will be dealt with in BCS-24 and BCS-25.

Ref: DDOC AC0186

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	ENHANCEMENTS
Feature	LOOPBACK REDUCTION FOR ISUP/AC
Feature no	F6652

FEATURE SYNOPSIS

This feature reduces the holding time of loop around trunks for attendant extended ISUP calls. Loop around trunks are used only when attendant is actively involved in the call.

FEATURE DESCRIPTION

This feature reduces the holding time of a loop back trunk on the following call types:

- ISUP trunk to AC calls
- AC to ISUP trunk calls
- ISUP trunk to Direct Inward System Access (DISA) calls.

These call types will be allowed to interwork directly as long as the attendant does not attempt to activate a feature which cannot presently interwork directly with ISUP trunks.

Ref: DDOC AG0704

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	INTERWORKING
Feature	ISUP PBX TRUNK INTERWORKING
Feature no	F6653

FEATURE SYNOPSIS

This feature allows ISUP trunks to be connected directly to PBX trunks. Loopback trunks are not required.

FEATURE DESCRIPTION

This feature allows interworking between ISUP trunks and PBX trunks, operating in both directions: calls incoming to the PBX in ISUP trunks and calls going out of the PBX on ISUP trunks.

Ref: DDOC AG0705

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	ADMINISTRATION
Feature	OPERATIONAL MEASUREMENTS
Feature no	F6654

FEATURE SYNOPSIS

This feature provides Operational Measurements and Logs for ISDN User Part (ISUP).

The ISUP OMs and log reports are grouped into the following categories:

- ISUP Utilization
- ISUP Performance
- Circuit Availability
- End-to-End Connection Performance.

FEATURE DESCRIPTION

ISUP Operational Measurement information is gathered in the Central Control, the Message Switch and Buffer for CCS7, and the Digital Trunk Controller.

The ISUP Utilization OM group measures the message volume.

The ISUP Performance OM group measures performance of the ISUP node by tracking its stability with respect to immunity to resets and abnormal conditions.

The ISUP Circuit Availability OM group measures circuit availability to determine overall circuit performance.

The ISUP End-to-End Connection Performance OM group measures circuit availability and unsuccessful call attempts to determine the effects of the surrounding network on ISUP performance.

The ISUP Logs are reported in conjunction with the pegging of certain ISUP Operational Measurements.

Ref: FDOC AG0922

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	PRODUCTS
Feature	ISUP PROTOCOL VERSION CONTROL
Feature no	F6959

Synopsis

The ISUP Protocol Version Control feature allows the DMS to operate with multiple networked versions of the ISUP protocol.

Implementation

A DMS requires information indicating the types of switches to which it is connected in order to operate with multiple networked version of the ISUP protocol.

This feature adds a new table, ADJNODE. This table provides information about the adjacent switch for each trunk subgroup.

A new field, ADJNODE, has been added to Table TRKSGRP to contain the index into Table ADJNODE that is used for the trunk group.

Field REMCQSUP in Table TRKSGRP has been moved to Table ADJNODE and re-named REMCTSUP. Field REMCTSUP indicates whether remote circuit testing is supported by the end office.

If an unrecognized message is received at a tandem ISUP DMS office the message will be passed along to the end office. At the end office all unrecognized messages will be logged, using ISUP110.

The OM field ISERRBAD of the ISUP group ISUPERRS is pegged when an unrecognized message is received at the end office.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX270AA New Peripheral Maintenance Package
NTX041AA CCS7 MTP/SCCP or
NTX041AB CCS7 MTP/SCCP

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any other existing feature.

Restrictions

Whenever an office changes its software version, all DMS switches connected to that office must change the datafill of Table ADJNODE to reflect this change.

Reference

FDOC AG0921

Package	NTX167AB04 CCS7 - TRUNK SIGNALING(UPG. OF NTX167AA)
Feature set	ENHANCEMENT
Feature	ISUP TRUNKS TO ATTENDANT CONSOLE INTERWORKING
Feature no	F7086

FEATURE SYNOPSIS

This feature provides three new capabilities for Attendant Consoles using ISDN User Part (ISUP) trunks:

Do Not Disturb
Attendant Message Waiting
3-Way Call.

FEATURE DESCRIPTION

Do Not Disturb

Do Not Disturb (DND) is a MDC set feature which prevents a station from receiving any calls while DND is active. When DND is active, calls to that station may be diverted to the AC in that station's subgroup. The AC may then override DND and return the call to the original station.

This feature allows a call on an ISUP trunk to be deflected from a station with DND active to an AC. The AC can override the DND and return the call to the station with DND.

Attendant Message Waiting

Attendant Message Waiting (MWT) provides a Message Center (MC) in the form of an AC where users can forward their stations so that messages may be left for them. These messages are stored based on their Directory Number (DN). These message may be retrieved from either the users station or from any other location by verbally providing the DN of the station.

This feature allows a call on an ISUP trunk to be forwarded to a MC and allows someone to call the MC over an ISUP trunk to retrieve messages previously left for them.

Three-Way Call

This feature allows an ISUP trunk to work directly with the Attendant Console, when a call incoming over an ISUP trunk is transferred to an AC.

Ref: FDOC AD1157

DMS ALL BCS27 Feature Description Manual			890124
NTX170AA01			Status: RTM CALLING CARD VALIDATION/OPERATOR ASSISTE
SERVICE :			
MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION		F1601	
MCCS - OPERATOR ASSISTED CCV		F3395	
Section B Available Features			NTX170AA01
			Page 2060

Package	NTX170AA01 CALLING CARD VALIDATION/OPERATOR ASSISTED
Feature set	SERVICE
Feature	MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION
Feature no	F1601

FEATURE DESCRIPTION

This feature allows a TOPS office to act as a host for manual inward validation of credit card numbers for operators in offices not equipped for CCIS/DS type verification. The term "manual" means that the number must be given verbally by the distant operator to the TOPS operator, who then enters it at the TOPS position for validation. This feature does not include the automatic form by which the number is keyed at the distant office without involving an operator in the TOPS switch.

Calls are originated in the distant office by seizing a trunk and outpulsing 1160 to the TOPS office.

Translations must be arranged in the TOPS office to use table TOPS routing to bring the call to a TOPS position, as with other inwards calls (such as 121 & 115x). A new call origination, 1160, is being provided to handle this feature.

When the call reaches a TOPS position, the TOPS operator will request the 14 digit credit card number from the distant operator.

The TOPS operator will key the number at the position, using the kp spl key, which will cause a CCIS/DS query to the BVC database.

While waiting for the reply, the 14 digit number will be displayed with the 4 PIN digits replaced by the letters 'XXXX' for security. The number will be followed by the letters 'VFY'.

When the reply is received from the BVC, the letters 'VFY' will be erased, and the display updated as follows: 1) Number invalid - flash full 14 digit display (including PIN as keyed) to allow full verification and reentry.

2) RAO known, PIN unrestricted - display RAO digits in place of 'VFY'

3) RAO known, PIN restricted - display RAO digits followed by the letter 'R'.

4) RAO unknown - no display beyond the 14 digit number.

The operator will then pass the reply on verbally to the distant operator.

If the number is invalid, the distant operator can check with the subscriber and give another number for the TOPS operator to check as above.

When the operators have finished, the TOPS operator releases the call, and becomes available for further traffic. The trunk is also idled normally when the distant operator releases it.

Package	NTX170AA01 CALLING CARD VALIDATION/OPERATOR ASSISTED
Feature set	SERVICE
Feature	MCCS - OPERATOR ASSISTED CCV
Feature no	F3395

FEATURE DESCRIPTION

Operator-Assisted Calling Card Service

Operator-assisted calling card service is part of the Mechanized Calling Card Service (MCCS) feature. MCCS normally provides a subscriber with the ability to dial billing information without the assistance of an operator, as follows: The subscriber places the call from a telephone capable of DTMF signalling by first dialing zero plus a seven-digit or ten-digit called number ('0+' call). Then, in response to an alert tone or announcement, a personalized fourteen-digit calling card number is dialed. If all goes well, the call is automatically connected and billed to the calling card.

There are cases, however, where calling card billing still requires the assistance of an operator.

- (1) The originating station is not equipped for DTMF signalling.
- (2) The toll billing office is not equipped for automated calling card digit reception.
- (3) The local office is not equipped for Automatic Number Identification (ANI).
- (4) ANI failure occurs at either the local or toll office.
- (5) Announcement circuits or DTMF receivers are all busy.
- (6) Subscribers elect not to dial the calling card themselves, or don't know how to do so, or perhaps require operator assistance for some other reason such as a person call.
- (7) Other kinds of calls (not '0+') reach an operator and calling card billing is requested, such as '0-' or '1+ coin' or '1+ hotel'.

Operator-assisted calling card service is available for these subscribers. This feature supports the MCCS method of calling card validation, which is by a direct signalling (CCIS) query to the Billing Validation Centre (BVC) data base. This query is sent when the operator enters the calling card on behalf of the subscriber. It takes approximately one second for the BVC to reply, at which time the status of the calling card is displayed to the operator.

Reaching the Operator

The prompt tones and announcements which request the subscriber to dial his calling card on '0+' calls, and the receivers which collect the DTMF digits, are provided by the toll switching office to which the call has been routed. On a trunk group basis the toll switch can determine whether the originating station has MCCA service. Alternatively, a direct signalling query to a centralized Billing Validation Centre (BVC), based on the calling number already identified by ANI signalling, can determine MCCA capability. Where no MCCA service is indicated, the subscriber is routed directly to an operator in the same manner as prior to the MCCA feature application.

Where MCCA service is provided, the subscriber receives the prompt tone or announcement when the toll office is ready to receive the calling card DTMF digits. At this point, a subscriber electing not to dial the calling card may reach an operator by one of three methods:

- (1) Do nothing. (A timeout occurs.)
- (2) Dial zero (DTMF only).
- (3) Flash the switch-hook.

In all three cases, the automatic calling card reception is terminated and an operator is attached. NOTE. Once the subscriber begins to dial in the calling card, operator access is thereafter available only by hanging up and re-originating the call.

The previous paragraphs describe how a '0+' origination can reach an operator. Understand, however, that '0-' or '1+' originations can also reach an operator in the usual way. This feature encompasses all types of originations for which either the calling party or the called party request calling card billing.

Operator Handling

Once the subscriber has reached an operator, he then quotes the appropriate calling card number to the operator, who keys in the information. The proper charge class for calling party billing to a calling card is 'station special calling' or 'person special calling'. For collect calls billed to a calling card, the charge class is 'station special called' or 'person special called'. (NOTE. A charge class restriction is described in the section entitled 'Restricted PIN'.) The call progresses much in the same manner as any other operator-handled call requiring special billing, except for the method of calling card validation.

Note that the operator may be called upon to provide any of the standard services available to subscribers. For example, collect or person-to-

person call handling, a change to third number billing, or a new called number. Once the billing information is accepted by the system, the call is automatically outpulsed and the operator may float the call.

Calling Card Validation

The calling card number is a fourteen-digit number consisting of a ten-digit billing number plus a four-digit Personal Identification Number (PIN).

The billing number is usually the directory number to which the call is to be billed, of the form 'NPA-NXX-XXXX' but may also be a special (non-directory) billing number of the form 'RAO-(0/1)XX-XXXX', where RAO is the Revenue Accounting Office which has assigned the billing number. These two forms of billing numbers are distinguished by examining the fourth digit.

The PIN is of the form 'NYYY' where 'N' is neither digit '0' nor digit '1'.

If the calling card number keyed by the operator does not conform to the formats specified above, the card is immediately rejected. Otherwise, it is validated by automatically performing a direct signalling query to the Billing Validation Centre (BVC). The reply from the BVC indicates if the calling card is acceptable. In all cases, the validation status is displayed on the operator's screen. If the billing is not accepted, a calling card number may be re-entered by the operator for validation and display. The call is not allowed to complete until an acceptable calling card number is entered, or an alternate billing class is entered.

Restricted PIN

There are two types of PIN which may be associated with a directory billing number. An 'unrestricted' PIN is valid for calls to all destinations and for station or person calls. A 'restricted' PIN, however, is valid only for station calls to the billing number (collect only service). In the latter case the subscriber needs only to quote the four-digit PIN to the operator, rather than the full fourteen-digit card number, as the billed number and the called number are the same.

If the operator keys only a four-digit calling card, it is assumed to be a PIN and the calling card is constructed from the ten-digit called number and the four-digit PIN. It follows that if the called number is an operator code or an overseas, INWATS or Directory Assistance number then the PIN is immediately rejected. It also follows that if the called number is

absent, as could be the case when a '0-' origination requires calling card billing, then calling card validation must be delayed until the called number is entered.

Irregardless of whether the operator keys a four-digit or a fourteen-digit calling card, the reply to a Billing Validation Centre query may indicate that the calling card is restricted. In all such cases, person calls are not allowed, and if the billing number does not match the called number the calling card is rejected.

Special Number Displays

Calling cards are displayed in the special number field on the TOPS console in the format '999-999-9999-XXXX' where 9's are digits and the PIN is masked with X's for security. The following displays are possible. Angle brackets are not displayed but mean that the enclosed characters are displayed in flashing mode.

SPL #	The subscriber could have dialed a calling card but chose not to. Displayed on call arrival, this informs the operator to encourage the subscriber to dial the calling card directly.
SPL # XXXX	A four-digit PIN has been keyed by the operator and displayed when the CLD number is absent. The full calling card number will be displayed when the CLD number is keyed.
SPL #<XXXX>	The four-digit PIN and the called number are not compatible. May be displayed when the operator keys either number.
SPL # 999-999-9999-XXXX VFY	A fourteen-digit calling card number has been keyed or a four-digit PIN has been keyed when a domestic called number is present. Validation (VeriFY) is in progress.
SPL # 999-999-9999-XXXX	The calling card could not be validated because of data base access problems. It is assumed to be valid and unrestricted. The Revenue Accounting Office (RAO) is unknown.

SPL # 999-999-9999-XXXX 999 The calling card number is valid and unrestricted. The RAO is displayed in the last 3 digit positions.

SPL # 999-999-9999-XXXX 999 R The calling card is valid and restricted. The RAO is displayed in the last 3 digit positions.

SPL #<999-999-9999-9999> The calling card number is not valid. Note that the PIN is not masked.

SPL #<999-999-9999-XXXX 999 R> The restricted calling card is not valid because it does not match the called number. May be displayed when the operator keys either number.

AMA Record Modifications

For billing purposes, it is necessary to record the following information regarding MCCS calling card validation:

- (1) the Revenue Accounting Office (RAO) returned from the Billing Validation Centre,
- (2) whether the calling card was customer-dialed or operator-assisted, and
- (3) whether or not the Billing Validation Centre was successfully accessed.

Because there is no need to record the four-digit PIN portion of the calling card (in fact, it should be deleted for security reasons), it can be conveniently replaced by the three-digit RAO followed by an information digit to be interpreted as follows:

- 0: BVC validated, customer-dialed
- 1: BVC validated, operator-assisted
- 2: BVC failure, customer-dialed
- 3: BVC failure, operator-assisted

'BVC validated' means that the calling card has been successfully validated by a Direct Signalling query to the Billing Validation Centre, and a valid RAO is present. Otherwise, 'BVC failure' is implied and the RAO has value '000'.

This method of recording the calling card validation information requires no format changes to the existing E0 AMA entry, which is where special billing numbers are recorded. What changes is the interpretation of the last four digits of the fourteen-digit special number when the special

number is a domestic credit card and the billing office is equipped for MCCS.

Note that these AMA modifications apply as well to customer-dialed MCCS calls - feature V1114.

NTX171CA02 Status: RTM MCCS CALL PROCESSING(ORDER VIA MASTER_PK

SERVICE	:	
MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION		F1601
MCCS - CUSTOMER DIALED ON TOPS TRUNKS		F1602
MCCS	:	
LIMIT TO NUMBER OF SEQUENCE CALLS		F2680
SERVICE	:	
MCCS - CUSTOMER DIALED ON LINES		F3390
MCCS - CUSTOMER DIALED SEQUENCE CALLS		F3391
MCCS - OPERATOR ASSISTED CCV		F3395

Package	NTX171CA02 MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA
Feature set	SERVICE
Feature	MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION
Feature no	F1601

FEATURE DESCRIPTION

This feature allows a TOPS office to act as a host for manual inward validation of credit card numbers for operators in offices not equipped for CCIS/DS type verification. The term "manual" means that the number must be given verbally by the distant operator to the TOPS operator, who then enters it at the TOPS position for validation. This feature does not include the automatic form by which the number is keyed at the distant office without involving an operator in the TOPS switch.

Calls are originated in the distant office by seizing a trunk and outpulsing 1160 to the TOPS office.

Translations must be arranged in the TOPS office to use table TOPS routing to bring the call to a TOPS position, as with other inwards calls (such as 121 & 115x). A new call origination, 1160, is being provided to handle this feature.

When the call reaches a TOPS position, the TOPS operator will request the 14 digit credit card number from the distant operator.

The TOPS operator will key the number at the position, using the kp spl key, which will cause a CCIS/DS query to the BVC database.

While waiting for the reply, the 14 digit number will be displayed with the 4 PIN digits replaced by the letters 'XXXX' for security. The number will be followed by the letters 'VFY'.

When the reply is received from the BVC, the letters 'VFY' will be erased, and the display updated as follows: 1) Number invalid - flash full 14 digit display (including PIN as keyed) to allow full verification and reentry.

2) RAO known, PIN unrestricted - display RAO digits in place of 'VFY'

3) RAO known, PIN restricted - display RAO digits followed by the letter 'R'.

4) RAO unknown - no display beyond the 14 digit number.

The operator will then pass the reply on verbally to the distant operator.

If the number is invalid, the distant operator can check with the subscriber and give another number for the TOPS operator to check as above.

When the operators have finished, the TOPS operator releases the call, and becomes available for further traffic. The trunk is also idled normally when the distant operator releases it.

Package	NTX171CA02 MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA
Feature set	SERVICE
Feature	MCCS - CUSTOMER DIALED ON TOPS TRUNKS
Feature no	F1602

FEATURE DESCRIPTION

INTRODUCTION

In an attempt to reduce operator involvement in credit card type calls and to reduce the incidence of fraud for both credit card and special billing type calls, a new set of features referred to as Mechanized Calling Card Service (MCCS) is being developed. This document will describe the workings of customer dialed calling card validation of MCCS. This feature will allow customers to enter their calling card numbers and complete their calls without access to an operator on automatically identified 0+ and 01+ (international) calls.

BACKGROUND

The present credit card format is 14 digits comprised of a 10 digit billing number in the form of:

1. NPA+NXX+XXXX
2. RAO+0/1 XX-XXXX

plus a 4 digit number consisting of a 3 digit RAO code and a single check digit. It is possible, using a check digit algorithm, to determine the validity of a RAOD type credit card.

The AT&T Co. has introduced calling cards with a very similar format except that the RAOD digits are replaced with a Personal Identification Number (PIN). A PIN is a 4 digit code where the first digit may not be a 1 or 0 but the remaining three digits may have any value from 0-9.

A PIN may be designated by the subscriber to be either a restricted or an unrestricted PIN. A restricted PIN will permit only station to station calls to the billing number (collect only service). An unrestricted PIN is valid for calls to all destinations and may be used for station or person billing.

Any DTMF telephone is capable of being used by a customer to key in a calling card number. If MCCS is available, the number will be forwarded to a Billing Validation Centre (BVC) for verification. For subscriber dialled calling card calls, no operator intervention is required. An announcement system is provided which provides verbal instructions and prompts to the subscriber. A list of announcements is provided at the end of this section.

The billing validation data base is maintained in several distributed BVC's which are accessed via CCIS/DS, the Direct Signalling feature of the CCIS network. All data for a given RAO or NPA-XXX resides in a single BVC, allowing a routing of queries by the number being queried. Routing data is maintained by AT&T Long Lines; the BVC's are associated with the Originating Toll Centres; and the data is provided by telco's.

A BVC query is expected to have an average response time approaching 1 second with a maximum of 2 seconds. Queries can be lost due to CCIS network failure or congestion, or due to failure or congestion in an individual BVC. (Provision is made in reply messages to indicate congestion, which should cause a fraction of the MCCS queries to be discarded.) CCIS links must be suitably provisioned as described in AT&T TA62.

ORIGINATING STATION TREATMENT

The first step in customer dialed calling card validation is to apply Originating Station Treatment(OST). This is done immediately after a customer has picked up his handset and dialed 0+ or 01+. This is necessary because the feature is accessible from all lines. There are three types of originating station treatments:

1. no customer dialed MCCS service (which means that a subscriber would route to an operator)
2. alerting tone;
3. alerting tone plus prompt announcement.

Customers at phones without MCCS service such as rotary dial phones would receive treatment 1. Subscribers at phones with MCCS service and where the caller would be expected to be familiar with the service such as a DTMF phone located in a residence would receive treatment 2. Customers at phones with MCCS service and where the caller could be unfamiliar with MCCS such as a public DTMF phone would receive treatment 3.

In order to determine the type of OST to apply to a call, a new optional table, MCCSOST, will be created. This table should contain one tuple for each incoming and two way TOPS trunk group in an office. Each tuple will be composed of two parts. One part will apply to the calls which originated on public phones and the other part will apply to calls that originated on nonpublic phones. In each part, one of three statuses should be specified: no service, calling card service, or BVC lookup. If the value is no service, then OST 1 will be applied. If the value is calling card service, then the telco must specify that either OST 2 or OST 3 is to be applied. If the value is BVC lookup, then the telco must specify the default action to take when the BVC lookup cannot be done (either OST 1, 2, or 3). The BVC lookup will either return a result which corresponds to one of the three originating station treatments or it will fail and the failure OST specified by the telco will be applied. If a call originates in an MCCS office on a TOPS trunk group which does not have an entry in table MCCSOST, then OST 1 will be applied.

It should be noted that a trunk group can only have a status of no service or MCCA service if all calls which originated on public phones or all calls which originated on private phones on that trunk group can be given the same OST. Otherwise, it must have a status of BVC lookup. Also note that each trunk group has two statuses and they are independent. For example, the calls which originate on public phones on a trunk group could have a status of MCCA service, while the calls which originate on private phones on the same trunk group could have a status of BVC lookup.

REACHING AN OPERATOR

After OST 2 or 3 has been applied, the customer may decide that he wants an operator. If so, there are three options. He may wait 5 seconds for a timeout, he may flash the switchhook, or he may key '0#' to cause an operator to be attached. If the customer does not seize this moment to route to an operator and begins to key his calling card number, he can no longer reach an operator without hanging up.

ENTERING THE CALLING CARD NUMBER

If the subscriber does not want an operator, he keys in his 14 digit calling card number or his 4 digit PIN if the billing number is the same as the called number. A format check is then applied to the number. If the customer keyed 14 digits, then the number must be in one of the formats listed in the Background section of this document along with a 4 digit PIN. Also, even though 800 is a valid NPA, it is not valid when used in a calling card. If the subscriber entered a 4 digit PIN the first digit cannot be 0 or 1. Also, the called number may not be INWATS, directory assistance or overseas. If the number passes the format check, then a BVC inquiry is made via the CCIS network. If the calling card number is valid then the number is outpulsed and the 'thank you' announcement is returned to the caller. If the BVC inquiry is unsuccessful, announcement #2 is returned to the caller which requests that the calling card number be reentered. If no dialing occurs within 3 seconds (T4-see the list of timeouts at the end of this section), the MCCA alerting tone is given. The customer then has 3 seconds (T5) to start dialing before being prompted by announcement #3. After this announcement, the customer has 5 seconds (T6) to dial. If no digit is dialed in this interval, the customer is given announcement #9 and the call is ended. If the customer enters a second calling card number and if this number again fails to pass the checks, then announcement #4 is played and the call is terminated. If the second attempt is successful, the number is outpulsed and the 'thank you' announcement is sent to the caller.

TIMEOUTS

Timeouts are defined following those in AT&T Technical Advisory #62. A table of timeouts is presented at the end of this document. A basic

interdigit timeout of 5 seconds (T9) applies to MCCS calls. Longer timeouts are used after natural breaks in a keying sequence such as after entering an NPA.

After a customer dials 0+, OST is applied. If the OST is tone only, then the customer has 5 seconds (T9) in which to begin dialling the calling card number or to take action to attach an operator. If the OST is tone plus prompt announcement, the subscriber has 1 second (T2) to begin action. If no action is begun, announcement #1 will be played. The customer is then given an additional 5 seconds (T3), to start dialling or take action to get an operator. If the customer has done nothing by the end of this time, an operator is attached to the call.

If a customer dials 4 digits after OST, interfield timing of 2 seconds (T12) is done. If no digits are dialed in this interval, a tentative assumption is made that this is a PIN and a validation is performed. While this is occurring, the customer has 3 more seconds in which to enter more digits. If no more are entered, the action indicated by the PIN validation is executed.

A complete definition of interdigit timing is provided at the end of this section.

ERROR CONDITIONS

Several different error conditions can occur during an MCCS keying sequence. A timeout as described above, can occur after a customer has begun dialling a calling card number. The '#' could be used incorrectly. This is an optional end of digit indicator. However, the customer could miss one of the digits in the calling card number and generate an error condition by striking the '#'. Also, if the subscriber keyed '#' immediately after OST had been applied (thereby indicating a calling card number of 0 digits), an error condition would be generated. An invalid character, such as an '3' could be entered which would cause an error condition to arise. Since these errors are equivalent to invalid calling card numbers, they are treated in the same manner. If this is the first attempt, then announcement #2 is played and the subscriber is given a second chance to enter the calling card number. If this is the second attempt, announcement #4 is played and the call is terminated.

DISCONNECTS AND FLASHES

As usual, disconnects will cause a call to be terminated. Also, flashes will normally be ignored. There are two exceptions to this. After OST has been applied, if the subscriber flashes, or if the subscriber pulses 0 and then flashes, the call will be brought to an operator.

UNEXPECTED DIGITS

Digits that arrive during a prompt announcement or tone will usually be ignored. However, there are four exceptions. If the digits arrive during announcements #1, #2 or #3 or during the OST tone, they will be processed normally and the announcement/tone will be stopped.

DTMF PAD ENABLEMENT

In order that MCCA can work, DTMF lines in local offices must be engineered so that DTMF pads are enabled on 0+ calls. In particular, the local office must be in a coin retention mode when processing coin first coin phones since it is necessary that the initial deposit be in the hopper in order to enable the DTMF pads on these types of phones. When coin retention mode is in effect, the coins will be returned on calling customer disconnect.

ANNOUNCEMENTS

The following is a list of announcements that will be provided with MCCA. They are taken from AT&T Technical Advisory #62. Only the subset of announcements which pertain to customer dialed calling card validation is listed here.

Announcement #1: Prompt announcement on a customer-dialed CC call using the tone plus prompt announcement OST.

"Please dial your card number or zero for an operator now".

Announcement #2: A customer dialing error has occurred on a customer-dialed CC call.

"Please dial your card number again now. (Pause) The card number you have dialed is not valid."

Announcement #3: Prompt announcement after an error has occurred and the alerting tone has been given.

"Please dial your card number".

Announcement #4: An invalid CC number was entered and the error threshold has been reached; the customer must hang up and reoriginate the call.

"Please hang up and dial zero plus the number you are calling. (Pause) The card number you have dialed is not valid."

Announcement #9: Termination announcement after error threshold has been reached, without another number being entered.

"Please hand up and dial zero plus the number you are calling."

Announcement #16: The following announcement is applicable whenever the subscriber has entered the card number correctly.

"Thank you."

Announcement #17: Alert tone prompt for calling card dialing. This is a complex tone consisting of 60 ms dtmf #-tone (941/1477hz * -10dbm) followed immediately by 940 ms of exponentially decayed dial tone (440/350 hz with time constant of 200ms initially at -10dbm)

The announcements will be produced by Digital Recorded Announcement Machine (DRAM). These will be switched into the call when required and remain with the call until a valid calling card number is received or the call is terminated. It will not be possible to utilize a conventional announcement machine for this feature.

HARDWARE ERRORS OR FAILURES

The actions taken on hardware errors or failures will depend on the type and severity of the errors. Service will be maintained as long as is possible. For example, if a DRAM fails before the 'thank you' message has been played but after the calling card digits have been collected, then the call will continue. However, if no DRAM's are available immediately after a subscriber dials 0+, the call will be routed to an operator.

ORIGINATION RESTRICTIONS

0+ calls from hotels which require nocharge messages will route to an operator in order to obtain the calling customer's room number.

MCCS is only defined for coin calls which arrive on trunks with multiwink or extended inband coin signalling. Calls which arrive on other circuits will timeout and route to an operator if the keypad is disabled by the end office when routing to an operator. Trunks from these offices should be datafilled for no service in table MCCSOST.

In BCS14, calls which originate from lines in 100/200 offices must be routed to TOPS via loop around trunks in order to receive MCCS service. This can be done by appropriately modifying the pretranslator pointed at by the entry for the line in table LINEATTR. It must point to an entry in

table POSITION which routes directly to a looparound trunk, not to TOPSPOS.

TIMING PARAMETERS

- T1 = Initial timing after MCCS for tone-only treatment (5 seconds).
- T2 = Initial timing after MCCS tone for tone-plus-prompt treatment (1 second)
- T3 = Timing after prompt announcement (5 seconds).
- T4 = Timing after error announcement (3 seconds).
- T5 = Timing after tone in error sequence (3 seconds).
- T6 = Timing after prompt in error sequence (5 seconds).
- T7 = Sequence call timing parameter.
- T8 = Sequence call timing parameter.
- T9 = Total timing after 4th digit (5 seconds).
- T10 = Interfield timing on all calls (6 seconds).
- T11 = not used.
- T12 = Timing after fourth digit on MCCS call to distinguish PIN only (2 seconds).
- T13 = Interdigit timing on all calls (7 seconds).
- T14 = Sequence call timing parameter.
- T15 = Sequence call timing parameter.

INTERDIGIT TIMING
CUSTOMER DIALLED MCCS CALL

PIN ONLY	N	Y	Y	Y (#)										
MCCS NUMBER	N	P	A	N	X	X	X	X	X	X	N	Y	Y	Y (#)
MCCS NUMBER	R	A	O	0/1	X	X	X	X	X	X	N	Y	Y	Y (#)
INTERDIGIT TIMING														
	T9	T9			T9		T9	T9	T9		T13	T13	T13	
INTERFIELD TIMING			T10			T9								
AFTER 1ST 4 DIGITS				T9										
AFTER 1ST 10 DIGITS										T13				

Package	NTX171CA02 MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA
Feature set	MCCS
Feature	LIMIT TO NUMBER OF SEQUENCE CALLS
Feature no	F2680

FEATURE SYNOPSIS

This feature provides the capability for the Telco to limit the number of sequence calls that can be made from a single billing validation centre query - in the case of MCCS calls.

FEATURE DESCRIPTION

The implementation of this limiting feature is by providing an office wide parameter to the Telco MCCS-SEQ-CALL-LIM. The Telco can decide what is the maximum number of allowed sequence calls on a single validation query and fill the table with values in the range of 0-127 with default at 127.

To prevent sequence calls, the datafill is zero. At the end of each call, the calling subscriber keys in the octothorpe (#) to continue with another call and once the limit is reached, he is routed to a treatment - announcement #9.

This feature needs F1602 and F3391.

Package	NTX171CA02 MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA
Feature set	SERVICE
Feature	MCCS - CUSTOMER DIALED ON LINES
Feature no	F3390

FEATURE SYNOPSIS

This feature allows MCCS services from lines to be supported in a DMS-100/200/TOPS environment without the need for loop around trunks. Originating station treatment is determined from the DTMF class of service indicator in the Line Attribute Table.

FEATURE DESCRIPTION

Currently calls which originate on lines in a 100/200/TOPS office route to MCCS via loop around trunks. This feature will allow 1FR ani lines without options, coin lines, 1FR hotel lines and PBX hotel lines to route directly to MCCS.

Lines will only be a candidate for MCCS service if they have DTMF service. If a line has DTMF service, then Originating Station Treatment (OST) must be applied. The OST applied to a line will determine if a line receives MCCS service and if so, whether a tone or tone and announcement is played to prompt the calling subscriber. In order to determine the type of OST to apply to a line, lines will be associated with TOPS trunk group CLLI names. This will be done by associating the entry in the ZEROMPOS field of table LINEATR with a CLLI in table TOPLNDIS. This CLLI name will be used to index table MCCSOST which contains the OST information.

Since CCF coin phones require that the initial deposit be retained in order to have their DTMF keypads enabled, offices which use this feature must be in a coin retention mode. The initial deposit will be returned upon calling customer disconnect.

Package	NTX171CA02 MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA
Feature set	SERVICE
Feature	MCCS - CUSTOMER DIALED SEQUENCE CALLS
Feature no	F3391

FEATURE SYNOPSIS

This feature allows MCCS subscribers who have successfully entered their calling card numbers to make additional calls without re-entering their calling card number. The "#" sign is used to signal to the DMS-TOPS office that the subscriber has requested a sequence call. This feature is an extension of the feature MCCS- Customer dialled on TOPS trunks (F1602). A partial list of announcement used for sequence call is provided at the end of the Feature Description.

FEATURE DESCRIPTION

a) Basic Call Flow

When a MCCS call which was made with a calling card with an unrestricted pin (or a pin whose status is unknown) is completed, the calling subscriber waits for the called customer to go on hook. Once this has occurred, the customer keys an '#' followed by a valid dialing sequence (valid dialing sequences are described below). Then a 'thank you' message is played to the subscriber. If the called number can be successfully translated, then the calling customer is connected to the desired party. Otherwise, he is connected to a standard tone or announcement.

After the calling subscriber keys an '#', he has two seconds, to begin keying the called number. If he does not begin keying in this time, he will be prompted by announcement #5. After announcement #5 has been played, he then has 10 seconds to begin entering the called number. If he does not do so, then announcement #5 will be played again. He then has 10 additional seconds to key in the called number. If he does not do so, then announcement #9 is played and the call is terminated.

If a calling subscriber does not receive answer from a successfully dialed MCCS call, he can terminate that call and begin a MCCS sequence call by striking the '#'. Note that this applies to all calls in the sequence including the first call.

There is no limit to the number of sequence calls that a subscriber can make.

b) Valid Dialing Sequence

A valid dialing sequence is one of the following:

1. International sequence call: 01 + country code + national number followed by an optional '#'.
2. Other sequence calls: (optional 0+) 7 or 10 digit called number followed by an optional '#'

ie. either
NXX XXXX (#) - 7 digit number,
or
NPA NXX XXXX (#) - 10 digit number.

c) Partial List of Announcement

1. Announcement #5: Prompt announcement on a customer-dialled MCCS sequence call "you may dial another call now".
2. Announcement #9: Termination announcement after error threshold has been reached without another number being entered. "Plase hang up and dial zero plus the number you are calling".

Package	NTX171CA02 MCCS CALL PROCESSING(ORDER VIA MASTER_PKG NTX171BA
Feature set	SERVICE
Feature	MCCS - OPERATOR ASSISTED CCV
Feature no	F3395

FEATURE DESCRIPTION

Operator-Assisted Calling Card Service

Operator-assisted calling card service is part of the Mechanized Calling Card Service (MCCS) feature. MCCS normally provides a subscriber with the ability to dial billing information without the assistance of an operator, as follows: The subscriber places the call from a telephone capable of DTMF signalling by first dialing zero plus a seven-digit or ten-digit called number ('0+' call). Then, in response to an alert tone or announcement, a personalized fourteen-digit calling card number is dialed. If all goes well, the call is automatically connected and billed to the calling card.

There are cases, however, where calling card billing still requires the assistance of an operator.

- (1) The originating station is not equipped for DTMF signalling.
- (2) The toll billing office is not equipped for automated calling card digit reception.
- (3) The local office is not equipped for Automatic Number Identification (ANI).
- (4) ANI failure occurs at either the local or toll office.
- (5) Announcement circuits or DTMF receivers are all busy.
- (6) Subscribers elect not to dial the calling card themselves, or don't know how to do so, or perhaps require operator assistance for some other reason such as a person call.
- (7) Other kinds of calls (not '0+') reach an operator and calling card billing is requested, such as '0-' or '1+ coin' or '1+ hotel'.

Operator-assisted calling card service is available for these subscribers. This feature supports the MCCS method of calling card validation, which is by a direct signalling (CCIS) query to the Billing Validation Centre (BVC) data base. This query is sent when the operator enters the calling card on behalf of the subscriber. It takes approximately one second for the BVC to reply, at which time the status of the calling card is displayed to the operator.

Reaching the Operator

The prompt tones and announcements which request the subscriber to dial his calling card on '0+' calls, and the receivers which collect the DTMF digits, are provided by the toll switching office to which the call has been routed. On a trunk group basis the toll switch can determine whether the originating station has MCCS service. Alternatively, a direct signalling query to a centralized Billing Validation Centre (BVC), based on the calling number already identified by ANI signalling, can determine MCCS capability. Where no MCCS service is indicated, the subscriber is routed directly to an operator in the same manner as prior to the MCCS feature application.

Where MCCS service is provided, the subscriber receives the prompt tone or announcement when the toll office is ready to receive the calling card DTMF digits. At this point, a subscriber electing not to dial the calling card may reach an operator by one of three methods:

- (1) Do nothing. (A timeout occurs.)
- (2) Dial zero (DTMF only).
- (3) Flash the switch-hook.

In all three cases, the automatic calling card reception is terminated and an operator is attached. NOTE. Once the subscriber begins to dial in the calling card, operator access is thereafter available only by hanging up and re-originating the call.

The previous paragraphs describe how a '0+' origination can reach an operator. Understand, however, that '0-' or '1+' originations can also reach an operator in the usual way. This feature encompasses all types of originations for which either the calling party or the called party request calling card billing.

Operator Handling

Once the subscriber has reached an operator, he then quotes the appropriate calling card number to the operator, who keys in the information. The proper charge class for calling party billing to a calling card is 'station special calling' or 'person special calling'. For collect calls billed to a calling card, the charge class is 'station special called' or 'person special called'. (NOTE. A charge class restriction is described in the section entitled 'Restricted PIN'.) The call progresses much in the same manner as any other operator-handled call requiring special billing, except for the method of calling card validation.

Note that the operator may be called upon to provide any of the standard services available to subscribers. For example, collect or person-to-

person call handling, a change to third number billing, or a new called number. Once the billing information is accepted by the system, the call is automatically outpulsed and the operator may float the call.

Calling Card Validation

The calling card number is a fourteen-digit number consisting of a ten-digit billing number plus a four-digit Personal Identification Number (PIN).

The billing number is usually the directory number to which the call is to be billed, of the form 'NPA-NXX-XXXX' but may also be a special (non-directory) billing number of the form 'RAO-(0/1)XX-XXXX', where RAO is the Revenue Accounting Office which has assigned the billing number. These two forms of billing numbers are distinguished by examining the fourth digit.

The PIN is of the form 'NYYY' where 'N' is neither digit '0' nor digit '1'.

If the calling card number keyed by the operator does not conform to the formats specified above, the card is immediately rejected. Otherwise, it is validated by automatically performing a direct signalling query to the Billing Validation Centre (BVC). The reply from the BVC indicates if the calling card is acceptable. In all cases, the validation status is displayed on the operator's screen. If the billing is not accepted, a calling card number may be re-entered by the operator for validation and display. The call is not allowed to complete until an acceptable calling card number is entered, or an alternate billing class is entered.

Restricted PIN

There are two types of PIN which may be associated with a directory billing number. An 'unrestricted' PIN is valid for calls to all destinations and for station or person calls. A 'restricted' PIN, however, is valid only for station calls to the billing number (collect only service). In the latter case the subscriber needs only to quote the four-digit PIN to the operator, rather than the full fourteen-digit card number, as the billed number and the called number are the same.

If the operator keys only a four-digit calling card, it is assumed to be a PIN and the calling card is constructed from the ten-digit called number and the four-digit PIN. It follows that if the called number is an operator code or an overseas, INWATS or Directory Assistance number then the PIN is immediately rejected. It also follows that if the called number is

absent, as could be the case when a '0-' origination requires calling card billing, then calling card validation must be delayed until the called number is entered.

Irregardless of whether the operator keys a four-digit or a fourteen-digit calling card, the reply to a Billing Validation Centre query may indicate that the calling card is restricted. In all such cases, person calls are not allowed, and if the billing number does not match the called number the calling card is rejected.

Special Number Displays

Calling cards are displayed in the special number field on the TOPS console in the format '999-999-9999-XXXX' where 9's are digits and the PIN is masked with X's for security. The following displays are possible. Angle brackets are not displayed but mean that the enclosed characters are displayed in flashing mode.

SPL #	The subscriber could have dialed a calling card but chose not to. Displayed on call arrival, this informs the operator to encourage the subscriber to dial the calling card directly.
SPL # XXXX	A four-digit PIN has been keyed by the operator and displayed when the CLD number is absent. The full calling card number will be displayed when the CLD number is keyed.
SPL #<XXXX>	The four-digit PIN and the called number are not compatible. May be displayed when the operator keys either number.
SPL # 999-999-9999-XXXX VFY	A fourteen-digit calling card number has been keyed or a four-digit PIN has been keyed when a domestic called number is present. Validation (VeriFY) is in progress.
SPL # 999-999-9999-XXXX	The calling card could not be validated because of data base access problems. It is assumed to be valid and unrestricted. The Revenue Accounting Office (RAO) is unknown.

SPL # 999-999-9999-XXXX 999 The calling card number is valid and unrestricted. The RAO is displayed in the last 3 digit positions.

SPL # 999-999-9999-XXXX 999 R The calling card is valid and restricted. The RAO is displayed in the last 3 digit positions.

SPL #<999-999-9999-9999> The calling card number is not valid. Note that the PIN is not masked.

SPL #<999-999-9999-XXXX 999 R> The restricted calling card is not valid because it does not match the called number. May be displayed when the operator keys either number.

AMA Record Modifications

For billing purposes, it is necessary to record the following information regarding MCCS calling card validation:

- (1) the Revenue Accounting Office (RAO) returned from the Billing Validation Centre,
- (2) whether the calling card was customer-dialed or operator-assisted, and
- (3) whether or not the Billing Validation Centre was successfully accessed.

Because there is no need to record the four-digit PIN portion of the calling card (in fact, it should be deleted for security reasons), it can be conveniently replaced by the three-digit RAO followed by an information digit to be interpreted as follows:

- 0: BVC validated, customer-dialed
- 1: BVC validated, operator-assisted
- 2: BVC failure, customer-dialed
- 3: BVC failure, operator-assisted

'BVC validated' means that the calling card has been successfully validated by a Direct Signalling query to the Billing Validation Centre, and a valid RAO is present. Otherwise, 'BVC failure' is implied and the RAO has value '000'.

This method of recording the calling card validation information requires no format changes to the existing E0 AMA entry, which is where special billing numbers are recorded. What changes is the interpretation of the last four digits of the fourteen-digit special number when the special

number is a domestic credit card and the billing office is equipped for MCCS.

Note that these AMA modifications apply as well to customer-dialed MCCS calls - feature V1114.

Package	NTX172AA01 MCCS - BILLED NUMBER SCREENING
Feature set	SCREENING
Feature	BILLED NUMBER SCREENING
Feature no	F1603

FEATURE SYNOPSIS

Billed Number Screening (BNS) is a feature used to curb attempts to fraudently bill calls to collect or third numbers. CCIS-DS is used to pass queries from the DMS-TOPS office to a centralized database where the number quoted by the subscriber is screened against a file of numbers marked as restricted stored in the database. This feature is particularly useful to prevent charging to public telephone directory numbers

FEATURE DESCRIPTION

The Billed Number Screening (BNS) feature allows a customer to designate that collect and/or third-number billing will not be accepted at a specified line number. Any calling party, using TOPS and attempting to bill a collect or third-number call to that number, will have the call denied before it advances beyond the TOPS. BNS also includes a Public Telephone Check (PTC) feature which allows telephone companies to prevent collect or third-number billing to their public telephones. BNS should help reduce the amount of fraud in billing to public telephones or nonworking numbers.

BNS will be applied to all conventional collect or third-number calls placed through a TOPS operator. The feature will allow numbers to be designated one of the following billing restrictions: collect denied, third-number denied, and public telephone check.

Any attempt by an operator to key a number as collect or third-number billing will cause a BNS (if available) query of a billing validation database, to see if any billing restrictions exist. The billing validation databases are located at several distributed BVC's (billing validation centres) which are accessed via CCIS/DS, the direct signalling feature of the CCIS network. All the BNS information is grouped along with the MCCS (mechanized calling card service) information, according to their NPA-NXX and it is up to the individual telco's to administer their own data. Total turnaround time of a database query should be less than 2 seconds. These databases return a code to indicate whether or not the query was successful as well as an explanation of what went wrong.

While the query is taking place AMA VFY will appear at the position to inform the operator that a verification is in progress and it will disappear as soon as the response is received. During the query the ST TMG and CA TMG keys will have no effect, along with KP FWD, KP BACK, all the class charge keys and KP SPL. Once the database query is completed, the operator will be informed if the type of billing requested has been denied or if the billing number is that of a public telephone or nonworking number.

This will be indicated at the operator position. The following table shows the possible results of the database query and the displays that will appear on the operators position.

NTX174AA03 Status: RTM AIOD(AUTO IDENTIFIED OUTWARD DIALING)

BILLING	:	
AIOD(AUTO IDENTIFIED OUTWARD DIALING)		F2454
AIOD FOR TIE TRUNKS		F2780
ADMINISTRATION	:	
AIOD - DATA STRUCTURES/TABLE CONTROL		F3727
MAINTENANCE	:	
AIOD - MAINTENANCE UTILITIES		F3728
ADMINISTRATION	:	
AIOD - PBX TRUNK & LINE OPTIONS		F3729
CALL PROCESSING	:	
AIOD - CALL PROCESSING		F3730
ADMINISTRATION	:	
AIOD - OPERATIONAL MEASUREMENTS		F3731
AIOD - LOGS & ALARMS		F3732

Package	NTX174AA03 AIOD(AUTO IDENTIFIED OUTWARD DIALING)
Feature set	BILLING
Feature	AIOD(AUTO IDENTIFIED OUTWARD DIALING)
Feature no	F2454

FEATURE SYNOPSIS

AIOD provides a means of billing outgoing calls from a PBX to individual PBX stations.

The telephone call from a PBX may appear to DMS on a PBX line or a PBX trunk. AIOD information relating to a telephone call on a particular PBX line or PBX trunk is provided over a separate datalink between the PBX and the Host office.

There may be one or more datalinks between the PBX and the Host office.

FEATURE DESCRIPTION

The AIOD data transmitted to the Host office is assembled by the DMS AIOD Receiver equipment into a message, ready for presentation to DMS CC software.

CC software uses the PBX circuit identifier to determine which PBX trunk or line is carrying the associated telephone call, and assigns billing for that call to the station identified.

The PBX circuit identifier given in the message uniquely identifies a PBX line or trunk.

In the case of a PBX trunk, the circuit identifier is the external trunk name.

e.g, for trunk BNRCAR 1234,
the external trunk name = AIOD PBX circuit identifier = 1234

For a PBX line, the circuit identifier must be provided by datafill, typically using Service Orders. The identifier will be prompted for when the AIOD line option is assigned.

The AIOD circuit identifier must be unique for a specific PBX, so care must be taken when datafilling a PBX which has both trunk and line appearances to DMS.

A single AIOD card on a host DMS consists of four trunk receiver circuits, one per datalink.

The AIOD card is connected to DMS on an MTM, occupying two circuit card slots and using four MTM ports, allowing four separate AIOD links to be serviced.

Call Processing

A PBX with AIOD facilities sends a call identification message (AIOD message) for every call it makes to the host Central Office, which in this case is a DMS-100.

DMS-100 needs the AIOD message for recordable, or 'billable' calls only. AIOD messages for non-billable calls are ignored.

Before routing a billable call from a PBX trunk or line, DMS-100 will expect to have received an AIOD message from the PBX.

Data contained in the AIOD message is used as part of the record, or records, for the identified telephone call.

If an AIOD message is not received by the time DMS-100 is ready to route, the DMS-100 will wait for a user specified time, to cater for a late arrival of the message.

If no AIOD message is received by the end of this time, the call may be, at the choice of the TELCO, routed to a treatment (reorder) or allowed to proceed, but billed to the default PBX number, or PBX special billing number.

DMS-100 supports AIOD in both LAMA and non_LAMA environments. Both NT and ATT AMA formats are compatible with AIOD.

In a LAMA environment, the AMA record generated for an AIOD call will contain a ten digit station number, constructed from the default PBX billing number, or, if assigned, the special billing number, and the four digit PBX station number, as identified by the AIOD equipment.

eg, default billing number = 6136211000

AIOD identified station number = 2123

recorded number = 6136212123

Note: The recorded number must be unique to the host office.

For Zero (0) +/- calls, the Calling Number spilled to the position will contain no special AIOD identifier (ie information digit or catcode).

In a non_LAMA office, the calling number spilled over a CAMA trunk will, as for 0+/- calls, contain no special information digit.

Security

Three alternative security philosophies will be supported by DMS :

- 1) No redundancy(single data link, single receiver)
- 2) Single datalink, parallel wired standby receiver
- 3) Duplicate datalink and receiver

The DMS-AIOD interface provides error-checking and fault-detection routines. In cases where an AIOD message is suspected faulty (eg. due to a protocol violation or parity mismatch), DMS shall either bill the call in question to the default PBX billing number, or route the call to treatment.

When DMS AIOD equipment is suspect, identified by self-diagnostics or CC-initiated diagnostics, a separate log and, if required, an Alarm will be generated.

Diagnostics provided for AIOD include checks on individual channel sanity and AIOD CPU tests.

Maintenance Support

Maintenance facilities allow an AIOD receiver to be Busied, Returned to service and tested.

The AIOD CPU performs diagnostics as a background task, without CC control.

The AIOD Audit shall run at regular intervals. The intervals, in common with other audits, shall be controlled by office parameter audit_interval in Table OFCSTD.

Alarms shall be produced if the number of busied AIOD receivers in a group exceeds a user defined threshold. Three thresholds shall be user defined, one for each of the alarm levels, Minor, Major and Critical.

The following operational measurements will be provided on a per AIOD group basis:

- 1) The total AIOD data messages received.
- 2) The total AIOD calls made (local and billable).
- 3) The total AIOD billable calls made.

4) Calls receiving no AIOD message .The call may be routed to treatment or allowed to proceed with billing assigned to a default number.

5) Peg count of the AIOD receiver's on a per group basis that are man-made busy.

6) Peg count of the AIOD receiver's on a per group basis that are system-made busy.

7) This counter provides a man-made-busy usage count of the AIOD receivers on a per group basis.The usage count is calculated on a slow scan basis of once every 100 seconds.

8) This counter provides a system-made-busy usage count of the AIOD receivers on a per group basis. The usage count is calculated on a slow scan basis of once every 100 seconds.

This item will be provided by creating a new OM group called AIOD.

References:

GS 2X01
TA 35
LSSGR SECT. 6.9
NTP 297-1001-451

Package	NTX174AA03 AIOD(AUTO IDENTIFIED OUTWARD DIALING)
Feature set	BILLING
Feature	AIOD FOR TIE TRUNKS
Feature no	F2780

FEATURE SYNOPSIS

This feature provides the Automatically Identified Outward Dialing (AIOD) option for tie trunks from a PBX incoming to IBN part of a DMS-100 CO. The AIOD option enables billing of the PBX station that originated the call rather than a default directory number of the PBX.

FEATURE DESCRIPTION

A PBX communicates with the local office by means of voice and data links (ref to GFX174AA for details). Calls outgoing from a PBX are transmitted on the voice links and billing information pertaining to a call is sent in the form of an AIOD message on a datalink. An AIOD message contains the directory number of the station that originated the call and is used by the local office to overwrite the default or special billing number.

Previously the AIOD option was provided only on PX and P2 type trunks and PBX lines that were part of the public network. But a PBX can also be a part of a private network and have tie trunks (IBN trunks) connecting it to the IBN part of the local office. Since AIOD was not provided on such trunks, calls routed on the private network were billed to the default PBX directory number associated with that trunk.

With the advent of this feature, the AIOD option is provided for incoming and 2-way tie trunks. Hence, for every call incoming on the tie trunk to the IBN part of the local office (private network), an AIOD message is transmitted on the datalink to the local office. This enables the billing of the station that actually originated the call.

Ref:

FDOC BR0780
FGX174AA - AIOD General Feature Description

Package	NTX175AA01 IBN - MULTI BILINGUAL CONSOLE
Feature set	DISPLAY
Feature	FLEXIBLE DISPLAY LANGUAGE
Feature no	F2455

INTRODUCTION

At present, the attendant receives messages on the alphanumeric display in response to call processing and feature processing events. These are system defined English messages.

This feature will provide the ability to datafill equivalent messages for the English messages in other languages. Up to seven additional languages will be available. An attendant console will have a standard operating language assigned to it via an option in the table ATTCONS. The operating language of the attendant consoles can be changed to another available language by invoking a language feature key or by using the wildcard feature.

DEFINING LANGUAGES

Available languages will be specified in the table ACLANG. The key for the table is a language name. English will appear as the first language and cannot be deleted or changed. Up to seven additional languages can be added to this table by BNR/NT personnel. The flexible language feature will display available languages by name on the console exactly as they appear in this table.

ASSIGNING LANGUAGE TO CONSOLE

Table ATTCONS

There will be a new option available for the options list in table ATTCONS. This option will be 'LANG' and will accept as data any language name defined in ACLANG. If a console is default to English messages this option need not be specified. The attendant can still change the operating language of the console if a feature key or wildcard code is assigned. Adding, changing or deleting this option will change the default operating language of the attendant console appropriately. The attendant console will switch over to the new default language when it is returned to service and then can be reset to another through the feature key. Deleting the language option will change the default back to English.

PROVIDING OPTIONAL LANGUAGE MESSAGES

All of the messages used for the attendant console can be found in the table ACMSG. The master set of English messages in this table are for reference purposes only and cannot be changed or deleted. When a new language is defined in ACLANG, a duplicate of the English master set will appear in ACMSG. The language name in the keys of the new set, however, will be the name of the new language. These tuples should be changed to provide translations of the standard English messages. All uses of the language name in table ATTCONS must be replaced with a valid language. This will require force releasing the console and returning it to service. Only then can the tuple from ACLANG be deleted.

MESSAGE TYPES

Each set of messages is split into five types. This type is part of the key, and is one of MESSAGE, TREATMENT, PREFIX, MONTH or DAY. MESSAGES⁰⁰ are used as single part displays for the console and are restricted to a maximum of 16 characters in length. When output on the attendant console, this type will be left justified and padded with blanks on the right when necessary. TREATMENTS are used as double part displays and are restricted to 13 characters. These are right justified when displayed on the console. PREFIXES are one or two letter prefixes used to prefix a display with a feature that has altered the routing of a call. Currently the only prefix in use is for call forwarding. The message type MONTH, contains all twelve three letter abbreviations of the months of the year. The size of these messages is 3 characters. The message type DAY, contains all seven three letter abbreviations of the days of the week. The size of these messages is also 3 characters.

MESSAGE KEY

The first part of the key is the language name, the second is the message type. The third part of the key is a number from 0 to x-1, where x is the number of messages of that type, defined in the current BCS. Corresponding messages or "translations" will have the same message type and message number.

RULES FOR REPLACING STRINGS

All system defined messages are constrained to the maximum length imposed by the English equivalent. This does not constrain word size, only total message length. Message length is usually 16 characters (the size of the display), or smaller to allow digits, prefixes, etc. to be displayed with them.

The character set of an alternate language is restricted to the letters A through Z, the digits 0 through 9, and the special characters &<sup>3>, -./:=_ (some may not appear exactly as shown here).

Strings must be entered with underscores instead of blanks inside the message because blanks are interpreted as the start of a new field. If any of the special characters are used in the string the string must also be entered surrounded by single quotes. Tuples in the tables ACLANG and ACMSG will be output showing underscores where specified. Messages appearing on the console display will of course have the underscores replaced by blanks.

NTX176AA05 Status: RTM NON RESIDENT ADMINISTRATIVE AIDS

ADMINISTRATION	:	
DATABASE	DUMP	F0898
DATA DICTIONARY DUMP		F0903
OFFICE RECORD REPORT OF WORKING SPARE TRUNK/LINES/LINE CARDS		F1203
JOURNAL FILE PRINT UTILITY		F1662
MECHANIZED LINE CARD ASSIGNMENT		F2311
MAINTENANCE AND TESTING	:	
ENHANCED TRUNK INVENTORY AND SPARES TESTING		F2327
ADMINISTRATION	:	
JOURNAL FILE DUMP FACILITY		F3383

Package NTX176AA05 NON RESIDENT ADMINISTRATIVE AIDS
 Feature set ADMINISTRATION
 Feature DATA DICTIONARY DUMP
 Feature no F0903

FEATURE SYNOPSIS

The Data Dictionary Dump (DBAUDSVB) produces a print-out of customer data schema. It contains the name of the data table, the field names, the field types (numeric, symbolic, table, structure, descriptor, procedure, pointer, area etc), the range of values and the semantics of fields.

It is a lab tool to monitor data schema changes.

FEATURE DESCRIPTION

The following is an example of the print-out:

```

RECEIVER    RCVRKEY                    TYPE   RCVR_MEMKEY   AREA RE-
FINES KEY 4
            RECEIVER   RCVRKEY                    CLLI RCVR_KIND
            RECEIVER   RCVRKEY                                            NUM
EXTERNAL_TRUNK_NAME
            RECEIVER   RCVRKEY                    ENDAREA
            RECEIVER   RCVRTYPE                  TYPE RCVR_TYPE STRING RANGE
4
            RECEIVER   RCVRTYPE                  'D'                    4
            RECEIVER   RCVRTYPE                  'A'                    4
            RECEIVER   RCVRTYPE                  END STRING RANGE
            RECEIVER   TMTYPE                    TYPE TM_TYPE STRING RANGE 4
            RECEIVER   TMTYPE                    'TM2'                 4
            RECEIVER   TMTYPE                    'TM4'                 4
            RECEIVER   TMTYPE                    'TM8'                 4
            RECEIVER   TMTYPE                    'MTM'                 4
            RECEIVER   TMTYPE                    'OAU'                 4
            RECEIVER   TMTYPE                    'ATM'                 4
            RECEIVER   TMTYPE                    'TAN'                 4
            RECEIVER   TMTYPE                    'T8A'                 4
            RECEIVER   TMTYPE                    'RSM'                 4
            RECEIVER   TMTYPE                    END STRING RANGE
            RECEIVER   TMNO                      TYPE   TM_NUMBER    RANGE 0 TO
2047
            RECEIVER   TMCKTNO                    TYPE   TM_CCT_NO   RANGE  0   TO
29

```

RANGE 4	RCVR KIND	TYPE	RCVR KIND	SYMBOLIC
	RCVR_KIND		'RCVRMF'	4
	RCVR_KIND		'RCVRDGT'	4
	RCVR_KIND		'RCVRATD'	4
	RCVR_KIND		'DRCVR3'	4
4	RCVR_KIND	END	SYMBOLIC	RANGE
RANGE 0 TO 10000	EXTERNAL_TRUNK_NAME_	TYPE	EXTERNAL_TRUNK_NAME	
FINES KEY 4	RCVR_MEMKEY	TYPE	RCVR_MEMKEY AREA	RE-
	RCVR_MEMKEY		CLLI RCVR KIND	
NAME	RCVR_MEMKEY		NUM EXTERNAL TRUNK	
	RCVR_MEMKEY		ENDAREA	
4	RCVR_TYPE	TYPE	RCVR_TYPE STRING	RANGE
	RCVR_TYPE		'D'	4
	RCVR_TYPE		'A'	4
	RCVR_TYPE	END	STRING RANGE	
	TM_TYPE	TYPE	TM_TYPE STRING	RANGE 4
	TM_TYPE		'TM2'	4
	TM_TYPE		'TM4'	4
	TM_TYPE		'TM8'	4
	TM_TYPE		'MTM'	4
	TM_TYPE		'OAU'	4
	TM_TYPE		'ATM'	4
	TM_TYPE		'TAN'	4
	TM_TYPE		'T8A'	4
	TM_TYPE		'RSM'	4
	TM_TYPE	END	STRING RANGE	

Package	NTX176AA05 NON RESIDENT ADMINISTRATIVE AIDS
Feature set	ADMINISTRATION
Feature	OFFICE RECORD REPORT OF WORKING SPARE TRUNK/LINES/
Feature no	F1203

FEATURE SYNOPSIS

This is a non-resident software utility (LCLF) that allows telco personnel to generate reports of circuit assignments for analog and digital trunks and lines, and card assignments and card slot vacancies for analog and digital trunk cards and line cards.

This method of on-switch report generation is preferable to the current method of producing these reports from IBM equipment at Northern because it eliminates the delay experienced by telcos in obtaining the reports from Northern and it ensures that the most up-to-date and accurate information available from the switch.

The system is capable of generating a total of nine reports that display the following information:

- ATCLLI - Working analog trunk circuits
- DTCLLI - Working digital trunk circuits
- R81001 - Line card assignments
- R81002 - Line card counts per bay
- R82001 - Trunk card assignments
- R82002 - Trunk card counts per shelf
- W80010 - Unassigned digital circuits
- W80020 - Unassigned analog circuits
- W81001 - Unassigned line cards

Sample output from each of these reports is obtainable by request to DSD Marketing, Product Planning.

Package	NTX176AA05 NON RESIDENT ADMINISTRATIVE AIDS
Feature set	ADMINISTRATION
Feature	JOURNAL FILE PRINT UTILITY
Feature no	F1662

FEATURE SYNOPSIS

This feature prints journal file in man readable format. The format is the same as in the table editor. The output is written so that it can be used as a data fill file.

This non-resident module (JRPRTSUB) can be loaded and unloaded on any switch provided the Journal File feature (Pacakage NTX056AA) is available.

Package	NTX176AA05 NON RESIDENT ADMINISTRATIVE AIDS
Feature set	ADMINISTRATION
Feature	MECHANIZED LINE CARD ASSIGNMENT
Feature no	F2311

FEATURE SYNOPSIS

This feature provides Telco the ability to automatically determine possible assignment patterns for newly ordered line cards during office extensions. It is also possible to automatically update the DMS database to implement the chosen assignment of cards.

FEATURE DESCRIPTION

This feature implements two new tables: DFINV and LNINV and a CI increment with its own set of commands.

The CI increment LCLF is used by Telco personnel to assign newly ordered line cards to vacant card slots on line drawers. When LCLF is entered, it sets up a list describing the status of every card slot. This status can be one of the following:

FREE The card slot is vacant

RESERVED The card slot is vacant but cannot be assigned

ASSIGNED The card slot has been assigned a card by LCLF: the database is unchanged; the card slot does not appear in table LNINV

EQUIPPED The card slot contains a card; the card slot appears in table LNINV, the line may or may not be assigned a directory number

Using LCLF, the user may only manipulate free, reserved and assigned card slots. He may promote assigned slots to equipped status by using the IMPLEMENT command to enter such card slots into table LNINV as HASU lines, However once this is done, LCLF cannot linequip these slots. This can only be done by deleting the lines from table LNINV. It is important to note that tables must not be added or deleted from the table LNINV while LCLF is in use.

The Telco card assigner may then use LCLF commands to make assignments of new cards. These assignments may be made via manual assignment commands that permit assignment to specific card slots, or via automatic assignment commands that use automatic card spreading algorithms to achieve a reliable spread of cards over the range of slots specified by the card de-

signer. As card assignments are made, the card slot status list is updated to indicate that certain slots previously vacant are now assigned. This list is used to check the validity of card assignments. The card assigner must also set up a card quota list to indicate the total quantities of cards that he wishes to assign. This list is used by the system as a checklist to ensure that the card assigner does not inadvertently assign more cards than he originally intended.

Commands are also available to unassign previously made manual or automatic assignments. Commands are also provided to reserve or unreserve certain slots to prevent assignments to them even though they are vacant. The user is also provided with commands to examine the status of slots.

If necessary, the card assignment session may be suspended for resumption at a later time. When this is done, the system creates a file to serve the current slot status list and card quotas. Upon resumption of the session, the system verifies the card list against the current database status or slots and reports any discrepancies in slot vacancy.

When the card assigner feels that all assignments are satisfactory, he can use a command to automatically enter his chosen assignments into the database table LNINV.

The LCLF supercom is invoked via the command LCLF.

Once LCLF has been entered, the commands described below are available to perform the card assignment function. In any command that requires the specification of card slots, the user may specify a specific slot by giving its LM frame number, bay number, drawer number and circuit number, or he may specify a value of -1 for any one or more of these four numbers. A value of -1 indicates that all of the corresponding items have been specified. For example, 0 0 0 -1 indicates slot 0 on frame 0, bay 0, drawer 0. Similarly, -1 -1 5 0 indicates slot 0 of drawer 5 on every frame and bay, and -1 -1 9 -1 indicates every slot on drawer 9 of every frame and bay. All slots may be specified by entering -1 -1 -1 -1.

Description of LCLF Commands

- a) ASSIGN This command is used to assign cards to specific slots.
- b) UNASSIGN To assign cards from specific slots
- c) RESERVE To reserve slots. Reserved slots are not assigned when manual or automatic assignment commands are used.
- d) UNRESERVED To unreserve previously reserved slots

- e) SPREAD To perform an automatic spread of the specified quantity of cards over the specified range of slots and to assign the cards according to this spread.
- f) SUSPEND To save the card slot status list and the card quota list in the specified file so that the card assignment session may be suspended for later resumption. sp
- g) IMPLEMENT To add the assignments made so far to the database table LNINV. The card slot status list is updated to change the status of all assigned slots to equipped.
- h) CARDLIST This command is used to display the current card quotas and assigned card counts or to see the card quotas.
- i) SLOTS To display the status of a range of slots. Either all the slots may be displayed, or only slots that are free or that are assigned any or a specific card may be displayed.
- j) REPORTS To generate a report file showing the status and card assignment of all slots on a specific or a range of frames.
- k) CLEAR This command is used to clear all assignments and unreserve all slots.
- l) LEAVE This command is used to exit from LCLF

Package	NTX176AA05 NON RESIDENT ADMINISTRATIVE AIDS
Feature set	MAINTENANCE AND TESTING
Feature	ENHANCED TRUNK INVENTORY AND SPARES TESTING
Feature no	F2327

DESCRIPTION

This feature integrates trunk inventory data into the call processing and maintenance software and thus ensure data integrity and the ability to test non-working trunks. The following command is used to display location, CLLI, card code and trunk state (unequipped, HASU or working) for the TM or DS1 specified:

```
TRKQUERY <TM> <TMTYPE> <TMNO>
        <DCM> <DCMNO> <DCM DS1 CKT>
```

Further, in order to provide functional equivalence with feature (F2221), several SOSEXCS are provided on the customer non-res tape. The command provided in the SOSEXCS are summarized below:

1. Print a list of all, working only, HASU only, or unequipped only circuits on a specific TM. e.g.

```
TRRKDATA 'TM' 'TM8' 0 'WKG'
```

Print a list of all, working only, or non-working only channels on a specific DCM circuit. e.g.

```
TRKDATA 'DCM' 2 4 'NWKG'
```

2. Print the number of circuits on a TM or DCM as above. e.g.

```
TRKCOUNT 'TM' 'TM8' 0 'WKG'
TRKCOUNT 'DCM' 2 4 'NWKG'
```

3. Print a list of circuits on all TMs of a certain type or all channels on all circuits of a DMC as in 1 above. e.g.

```
TRKDATAALL 'TM' 'TM8' 'WKG'
TRKDATAALL 'DCM' 2 'NWKG'
```

4. Print the number of circuits on all TMs of a certain type or all channels on all circuits of a DCM as in 2 above. e.g.

```
TRKCOUNTALL 'TM' 'TM8' 'WKG'
TRKCOUNTALL 'DCM' 2 'NWKG'
```

Package	NTX176AA05 NON RESIDENT ADMINISTRATIVE AIDS
Feature set	ADMINISTRATION
Feature	JOURNAL FILE DUMP FACILITY
Feature no	F3383

FUNCTIONAL DESCRIPTION

The purpose of this feature is to allow cross BCS application of the journal file to avoid a DMO freeze. This will be accomplished by dumping the journal file from the old load in external format, using the reformat system where necessary, and datafilling it into the new load.

The non-resident CI command JFDUMP will be used to dump the journal file(s) as a sequence of datafill commands. The existing module, DMOPRO, will be used to restore this data into the new load. The external form of the data will be as defined in the old load by the data dictionary or, if a reformat is required, by the reformat system. The transfer medium will be fixed length record file(s) as supported by the FILESYS subsystem.

The intent of this feature is not to permit ALL types of DMO activity, but to allow certain types to continue during the (current) DMO freeze of a dump and restore. In particular, the following types of activity are not allowed:

- modifications to any table where the data is in any way dependent upon or related to a hardware status outside of the realm of table control.
- modifications to any data not contained in a table accessible via the table editor.

The exception to these rules is that all service order activity is allowed. This will be possible via a modification to SERVORD which will place a tuple for a phantom table in the journal file which, when datafilled, will perform the correct action regarding the hardware status of the line being modified.

The reason for the first rule has nothing to do with converting the journal file to external form, but results from problems in datafilling such tuples in the new load. The state of the hardware in the new load cannot be guaranteed to be the same as it was in the old load at the time of the original DMO (i.e. MAP activities are not recorded in the journal file). The reason for the second rule is obvious.

If it is necessary to violate the first rule, the following manual procedure may be used:

- close the current journal file via JFSTOP.
- make the necessary change(s) and manually record it(them). It(They) will have to be re-

applied exactly in the new load manually at the appropriate time. - start a NEW journal file.

In transferring this activity to the new load, datafill the JFDUMP file representing the journal file prior to the change, apply the change, and datafill the remainder. It is recommended that this procedure be avoided if at all possible since due to its manual nature it is prone to error.

Error handling by JFDUMP consists of an inforamory message along with the external view of the tuple causing a problem. These messages are printed on the controlling terminal and also appear as comments in the output file. Conversion of a logical tuple to external form may not be possible in all cases. For example, given a table using old table control where a sub-table tuple is modified in any way will result in an error for the sub-table tuple if the tuple in the head table corresponding to the sub-table is subsequently deleted. The same is true for sub-sub-tables.

All errors must be investigated thoroughly before datafilling in the new load.

NTX177AA01 Status: RTM NON RESIDENT GENERAL UTILITIES

ADMINISTRATION	:	
TAPE COPY UTILITY		F1677
TAPE DIRECTORY PRESERVATION UTILITY		F1678
COMMAND SCREENING		F1680
PARAMETER QUERY		F1681

Package	NTX177AA01 NON RESIDENT GENERAL UTILITIES
Feature set	ADMINISTRATION
Feature	TAPE COPY UTILITY
Feature no	F1677

FEATURE SYNOPSIS

The Tape Copy Utility (COPYTSUB) is a non-res. software module used to copy a source tape to a destination tape. All files on the source tape are copied, including the volume header, user labels, end of volume and user trailer lables, as per IBM format.

This is a medium copy system as opposed to file copy system which is resident in DMS switch.

Package	NTX177AA01 NON RESIDENT GENERAL UTILITIES
Feature set	ADMINISTRATION
Feature	TAPE DIRECTORY PRESERVATION UTILITY
Feature no	F1678

FEATURE SYNOPSIS

The normal tape handling utility which is resident in DMS switch requires that the tape be listed each time it is used to build up the Directories in the DMS switch. This may be a long, tedious, repetitive process specially at commissioning time when modules are loaded and unloaded quite frequently.

The tape directory preservation non-resident utility uses two simple commands WRITEDIR and READDIR to generate and read directories without having to list the tape.

Package	NTX177AA01 NON RESIDENT GENERAL UTILITIES
Feature set	ADMINISTRATION
Feature	COMMAND SCREENING
Feature no	F1680

FEATURE SYNOPSIS

The PRIVC SUB non-resident software allows telco to define up to 16 command classes. The PRIVCLAS command defines a privilege class for a particular command (or program name). Once defined, another command (PERMIT) which is resident in DMS, assigns to a user a set of privileged classes which defines the commands (or program names) that can be executed by this user. The user OPERATOR always has ALL privilege classes.

The following is the Syntax of command PRIVCLASS:

```
PRIVCLAS {ALL          }
          {command_name} [program_name] {privclass}
          {program_name} [privclass]
```

Lists, adds, changes, or deletes the class number of an input command or program name. If none of the optional parameters is specified, the command lists the last assigned class number associated with command name or program name, or ALL classes of both. If a program_name and/or a privclass are specified as optional parameters, a class number is added or changed for command_name and/or program_name. The program_name should be specified if the command_name is not unique. If a program name is not specified, it defaults to the base CI program. If NONE is specified for privclass, the privclass is deleted for the specified command_name and/or program_name. If this is done, any user can issue the command.

where command_name = The name of the input command or its mnemonic.

program_name = The name of the program that is to be screened or the name of the program in which the command that is to be screened resides. If not specified, it defaults to the base CI program.

privclass = The class number that is to be assigned to the input command or program increment.
Value = 0 - 15, NONE, DUMPSAFE, DUMPUNSAFE:

Package	NTX177AA01 NON RESIDENT GENERAL UTILITIES
Feature set	ADMINISTRATION
Feature	PARAMETER QUERY
Feature no	F1681

FEATURE SYNOPSIS

This non-resident software (WHATSSUB) is used to query parameters in a directory to determine its characteristics. Any file, device, command, program name, procedure etc. which is listed in DMS directories may be queried.

The following is an example of the query:

```
> CI
> WHATS MAPCI
```

```
MAPCI; INCR: OOC MAPCI, UNPRIV'D, DUMPUNSAFE RO IN ST IN DIR
FFFF,13601, 8004 PROGDIR
```

The characteristics mentioned here are CI Increment, unprivileged command class, dump unsafe, and MAPCI is found in program directory and is marked as Read Only (RO).

NTX178AA01 Status: RTM NON RESIDENT DIAGNOSTIC UTILITIES

MAINTENANCE AND TESTING	:	
BNR - AMA/CDR TAPE DUMP UTILITY PROG (AMATAPE)		F1044
ADMINISTRATION	:	
LOG ANALYSIS PROGRAM		F1459
TRANSLATION OF CIRCUITS TO DIGITS DIALLED		F1682
OM TAPE PRINT UTILITY		F1683
MAINTENANCE AND TESTING	:	
NT - AMA/CDR TAPE DUMP UTILITY PROG (AMADUMP)		F1796

Package	NTX178AA01 NON RESIDENT DIAGNOSTIC UTILITIES
Feature set	MAINTENANCE AND TESTING
Feature	BNR - AMA/CDR TAPE DUMP UTILITY PROG (AMATAPE)
Feature no	F1044

FEATURE SYNOPSIS

An optional non-resident utility (AMATAPE) is available for the purpose of providing a display or hard copy (dump) of the contents of AMA files produced in a LAMA or CAMA office.

The AMA Tape Dump software is accessed by loading and listing the non-res tape and typing LOAD AMATAPE.

Note: Files being dumped should be on a drive not allocated to recording.

The subcommands of the AMA tape dump utility are accessed by typing:

AMATAPE filename

Where:

filename is the name of the AMA datafile from a mounted and listed AMA tape or disk.

The DMS responds with the prompt AMATAPE >.

The subcommands associated with the AMA tape dump utility are DUMP, FILTER, DURATION and GRAPH.

For a complete description of above feature, refer to NTP 297-1001-119 Section 9.

Package	NTX178AA01 NON RESIDENT DIAGNOSTIC UTILITIES
Feature set	ADMINISTRATION
Feature	LOG ANALYSIS PROGRAM
Feature no	F1459

FEATURE SYNOPSIS

The LOG reports generated by a running DMS system constitute a wealth of valuable information about system responses under certain conditions. As well, an outpouring of certain types of LOG reports is often an advanced warning of imminent system problems. Analysis of LOG reports generated over a period of time often reveals patterns of system behavior which is extremely helpful in isolating the real cause of a problem.

Current practice is that LOG reports are directed to a line printer. Printed reports are examined line by line. Such a practice has two shortcomings:

first, ordinary line printers are often too slow to handle outbursts of LOG reports. Lots of them end up being lost. Second, eyeballing the log reports line by line in order to identify certain types of reports is tedious and inaccurate, particularly when hundreds or thousands of lines are involved.

A much better alternative is to capture the LOG reports in a on-line magtape, where the speed of those devices is high enough to ensure that no reports get lost. The tape file is then processed with a LOG ANALYSIS program at a later time on the same switch, or on a different switch.

The LOG analysis program (SCANLOG) first interrogates the contents of the tape containing the logs and sort the contents into appropriate classes.

FEATURE DESCRIPTION

Three commands are implemented by SCANLOG software:

a. Command SLCLOG

This command selects LOG reports according to specific content in specific fields. It also allows selection of reports output by the DMS system during a specified time interval.

b. Command STALOG

This command extracts type(s) of LOG reports output over certain periods of time and perform a time-histogram analysis on them.

This command is provided to unravel time patterns, if any, of the occurrence of specified types of LOG reports. Because of DMS's periodic system - initiated auditings on its subsystem, the time-histogram analysis will be particularly useful. Three parameters, in addition to others, are required START-TIME, STOP-TIME, and RESOLUTION.

c. Command TRNLOG

This command extracts translates SWER or DUMP related LOG reports.

SWER or DUMP related LOG reports have forms quite different from other classes and hence require differed consideration. In particular, one may want to translate certain fields in the dumped text into plain English language instead of outputting the original text which is often some sort of hexadecimal codes.

Package	NTX178AA01 NON RESIDENT DIAGNOSTIC UTILITIES
Feature set	ADMINISTRATION
Feature	TRANSLATION OF CIRCUITS TO DIGITS DIALLED
Feature no	F1682

FEATURE SYNOPSIS

This feature is more commonly known as the Automated Call-through Test System (ACTS). It is the contrary of Translation Verification feature (NTX055AB) resident in DMS switch. In Translation Verification, the user specifies the digits dialled and the software goes through the translation and identifies the outgoing trunk which is taken by the dialled digit. In ACTS, the user specifies the incoming and outgoing circuit and the software returns the dialling information in order to complete the call.

The Automated Call-through Test System (ACTS) consists of two main features, the Reverse Translator and the Call-through Test Plan.

The Reverse Translator (XLATE), enables the user to specify an incoming and outgoing circuit and obtain the dialling information to make the call. These calls can be line to trunk or trunk to trunk.

The second feature is the Call-through Test Plan (CTPLAN) which determines the set of calls to perform call-through testing and does a reverse translation on each.

FEATURE DESCRIPTION

a. Loading and Unloading Procedures

Loading Procedure

Many of the features of the DMS-100 Family are optional depending on the feature packages ordered by the TELCO. An example of this is the s/w related to lines. Since ACTS must be loaded into the offices which may or may not contain these optional features, it must be self-customizing. i.e. The lines portion of ACTS is only loaded if the DMS office contains lines.

The following three modules form the core of ACTS and must always be loaded as follows:

LOAD ACTSG1

LOAD ACTSCSA

LOAD ACTS

ACTS is then entered by typing at a terminal:

ACTS

The program will return with a message of the form:

yPlease load the following modules ACTSLN, ACTSIT, ACTSSC and re_enter ACTS'.

The program has determined the feature content of the DMS and asked for the corresponding optional modules of ACTS to be loaded. The optional ACTS modules are then loaded:

LOAD ACTSLN

LOAD ACTSIT

LOAD ACTSSC

etc

Re-enter ACTS by typing at a terminal:

ACTS

The program will return with the message:

yACTS VERSION x.x'

The customizing feature in ACTS can be overridden by entering:

ACTS NOCUST

Unloading Procedure

The procedure for unloading ACTS is the reverse of above. First the optional modules are unloaded as follows:

UNLOAD ACTSIT

UNLOAD ACTSLT

UNLOAD ACTSLN

UNLOAD ACTSSC

UNLOAD ACTSIS

UNLOAD ACTS250

Next the core modules are unloaded:

UNLOAD ACTS

UNLOAD ACTSCSA

UNLOAD ACTSG1

ACTS Aspects

The following are the aspects of ACTS currently available:

ASPECT	DESC	CIRCUIT TYPES SUPPORTED
-----	----	-----
ACTSIT	intertoll	it,t101,t105
ACTSLT	local trunks	ti,to,an,ir,da,rc,oc,op,oi,t2,td
ACTSIS	inc., no digits	is
ACTSSC	cama	sc,in
ACTSLN	lines	line and hunt type circuits
ACTS250	DMS250 trunks	onal,imt,dal

b) Reverse Translator (XLATE)

Syntax

XLATE <originator> <terminator>

where <originator> and <terminator> are:

LINE <dir num>

or

TRK <clli> [<ningrp>]

<dir num> is the 7 or 10 digits directory number
 <clli> is the trunk common language location identifier
 <ningrp> is the trunk number in group (optional)

Output

The following information is output as a result of the XLATE command:

Originating circuit information

clli or directory number

ckt location data (tmtype, tmno, tmcktno or len)

card code

signalling info (start type, pulsing type)

Dialling information

digits to dial

ani digits (if required)

Terminating circuit information

as above for originating circuit

e.g.

Originating Circuit

```

                                ...DCM...
Clli      Name      No Ckt TS      Cardcode      Sig      Start
SC2WAY    10        1  12  9      DS1S1G        MF        WK

```

Dialling Information

```

Digits to Dial      Ani Digits
8365555             06215555

```

Terminating Circuit

```

                                ...TM...
Clli      Name      Type No Ckt      Cardcode      Sig      Start
TERMCITY  802      TM8   6  12      2X88AA        DP        IM

```

Description

The XLATE command activates the reverse translator for an originating and terminating circuit.

The terminator is located in the translation tables (STDPRTCT, HNPACONT, FNPACONT, OFRT) and then a path is determined from the originator to the terminator. The path found determines the digits to be dialled. Finally the screening tables (LCASCRNC, CLSVSCRC) are checked to ensure the call will not be screened.

For the HNPACONT and FNPACONT tables, if no digits can be found to reach the route to the terminator then a TELCO message is sent indicating the route table will be searched again for the terminator, starting at the last route found.

When the digits are being made up, they will sometimes have to be expanded with yfill' digits to satisfy minimum incoming digits requirements or HNPA code type. The digit 5 is used in such cases. (The perfect 1-mean-nothing- digit).

The option DEBUG generates additional information used for debugging the reverse translator. The option ALT causes the reverse translator to consider alternate as well as direct routes to the terminator. The option OPER controls whether operator assisted calls will be counted as a successful translation. In normal use all the options would remain at their default values.

c. Call-through=Test Plan (CTPLAN)

Syntax

CTPLAN

Output

A series of test calls is output with the same format as for the XLATE command except that each call is numbered.

After all the call data is output, a list of trunk groups and pm's for which a test call could not be determined, is printed.

Description

CTPLAN activates the call selection algorithm which selects a set of calls to optimally perform the call-through tests and does a reverse translation on each.

The call selection algorithm works by sorting all the incoming and two-way trunk groups into a list of originators and all the outgoing and two-way trunk groups into a list of terminators. It then attempts to work out a call to every terminator from a prime originator(s), then a call from every originator to a prime terminator(s). This results in a fan type of call call pattern which covers the majority of paths through the translation data.

A single line to trunk call is also determined.

All the dcm's, tm2's, tm4's and tm8's in the office are also sorted into a list. This list of pm's is used to ensure a call has been determined for each pm.

d. Options

Two options can be applied to test the call selection algorithm. The option CTDEBUG generates additional debug information used for testing the call selection algorithm. The option SCRN allows certain trunk-types to be excluded from the originators and terminators lists. In normal use the options would remain at their default values.

Options

Syntax

```
OPTIONS [<option>] {NODEBUG,  DEBUG
                    NOALT,    ALT
                    NOCTDEBUG, CTDEBUG,
                    NOOPER,  OPER
                    CLEAR,
```

SCRN [<screening>] {INTERTOLL,
LOCAL,
LINES,
TANDEMIS,
DMS250,
CAMA}

where:

The default options are: NODEBUG, NOALT, NOCTDEBUG, NOOPER.

OPTIONS with no parameters displays the currently set options.

DEBUG displays additional information useful for debugging ACTS. See section 4.2

ALT translates using both direct and alternate routes.

CTDEBUG displays additional information for the call-through selection algorithm useful for debugging ACTS.

OPER causes translations requiring operator assistance to not be screened.

SCRN allows certain circuit types to be ignored by the call-through selection algorithm.

INTERTOLL screens trunktype IT

LOCAL screens trunktypes T0, T2, T1, TD, OC, OP, RC, AN, O1, DA, IR

CAMA screens trunktypes IN, SC

TANDEMIS screens trunktype IS

LINES screens lines

DMS250 screens trunktypes ONAL, DAL, IMT

DEBUG Option

The DEBUG option displays additional information indicating the process the reverse translator is following to work out the translation of the call. This information is useful for tracing suspected bugs in the program or the office data. The following information is displayed:

EXTERNAL TABLE NAME - This is the name of the set of data as it appears in table form on a MAP. It is the data being examined by the reverse translator at that time.

SEARCH ITEM SELECTOR (SIS)- The SIS indicates what is the target of the search into a translation table.

i.e.

SIS	Item
---	----
0	terminating circuit
1,4	path to OFRT table
2	path to FNPACONT table
3	path to HNPACONT table

DIGITS - Various digits are displayed which are used to build the final call data. These digits are usually the index into the external table being searched at that time. Note that the digit 0 appears as a 10 in these messages.

ROUTE INDEX - The route index to the terminator is displayed when located in one of the route tables (table OFRT, table HNPACON subtable ROUTEREF or table FNPACONT subtable ROUTEREF).

REINITIALIZATION MESSAGE - When the reverse translator has begun building the translation data but has reached a dead end, the message Reinitializing call data appears to indicate the search was not successful and has restarted elsewhere.

OTHER INFORMATION - Various other information is displayed depending on how the call is translated such as type of screening, min/max digits constrains, cama not authorized for a cama call etc. These messages are self-explanatory.

CTDEBUG Option

The CTDEBUG option displays additional information regarding the call selection algorithm. It is usually useful only for debugging the program.

When set, this option causes all the originators and terminators in the office (excluding lines) to be displayed. This data is derived from the TRUNK_GROUP_DATA descriptor in TRKDUL after being sorted into the originator list (incoming and two way) and the terminator list (outgoing and two way).

Also, each prime trunk group or line is shown as it is selected. The prime is the circuit for which all calls are fanned from or to.

If a circuit is selected to be part of a call but is found to be on a pm which already has a call planned, a new member in the group will be selected and a message will appear indicating the decision.

Lastly, the call data is dumped from each call whether the translation was successful or not.

Package	NTX178AA01 NON RESIDENT DIAGNOSTIC UTILITIES
Feature set	ADMINISTRATION
Feature	OM TAPE PRINT UTILITY
Feature no	F1683

FEATURE SYNOPSIS

This non-resident software (OMTDMPSU) prints, in man-readable format, the Operational Measurements which are stored in a magnetic tape. The OM tape is usually sent or automatically dumped to a down-stream processing centre for data processing to produce traffic or trend analysis reports. However, the Telco can also print out the OM data in crude format using this print utility. The format is identical to the on-line OM print-out (OMPR200 series) directed to a line printer.

Package	NTX178AA01 NON RESIDENT DIAGNOSTIC UTILITIES
Feature set	MAINTENANCE AND TESTING
Feature	NT - AMA/CDR TAPE DUMP UTILITY PROG (AMADUMP)
Feature no	F1796

FEATURE SYNOPSIS

This non resident program (ADUMPSUB) is used to print-out (in either mnemonic or hexadecimal formats) all or selected records of an AMA/CDR/SMDR tape.

This program is used by Commissioning to perform on-site verification of AMA/CDR/SMDR system. It can also be used by certain Telco's to print out AMA billing records before the down-stream processor is set up or modified to handle DMS AMA tape format.

FEATURE DESCRIPTION

To load the program from tape, first mount and list the tape containing the necessary load file (ADUMPSLD). Then enter:

```
Copy ADUMPSFC SFDEV
Read ADUMPSFC
```

If ADUMPSFC is not available, enter:

```
Load ADUMP
```

At this point the tape containing the AMA/CDR/SMDR datafile should be mounted and listed (as a utility tape-not within the AMA subsystem).

Upon completion of testing, the program should be unloaded by entering:

```
Unload ADUMP
```

The commands currently supported by the program are:

- i) INCLUDE,
- ii) EXCLUDE,
- iii) DISPO,
- iv) DISP1,
- v) DUMP, and
- vi) LEAVE.

```
INCLUDE
```

This command is invoked with a list of AMA/CDR/SMDR record types and its function is to include the specified record types in the tape dump. The default is to include all record types.

e.g. INCLUDE [<record_code(s)>]

EXCLUDE

This command is invoked with a list of AMA/CDR/SMDR record types and its function is to exclude the specified record types from the tape dump. The default is to exclude all record types (i.e. to display only header information).

e.g. EXCLUDE [<record_code(s)>]

DISPO

This command is invoked without any parameters and its function is to display the excluded record types.

e.g. DISPO

DISP1

This command is invoked without any parameters and its function is to display the included record types.

e.g. DISP1

DUMP

This command is invoked with a non-optional parameter and an optional parameter HEX and its function is to dump the selected records in mnemonic (0= hexadecimal) format.

e.g. DUMP AMA/CDR/CDR250 [HEX]

LEAVE

This command is invoked without any parameters and its function is to exit from the program environment.

e.g. LEAVE

To obtain a brief description or a specific command (with the exception of the LEAVE command), enter:

Q <command>

where <command> is the command to be queried. The description displayed will include a functional description of the command and the parameters required to invoke it.

In addition, the program entry command (ADUMP) may be queried by entering:

Q ADUMP

The following is an example of the print out:

(i) Output of DUMP command

```
333 BLOCK HEADER ENTRY (C1C1):  
TIME STAMP DAY: 123 HOUR: 12  
OFFICE IDENTIFICATION: 123456 BLOCK COUNT: 12345
```

```
333 INCOMING NON-EMERGENCY TRANSFER ENTRY (FA):  
TRANSFER TIME DAY: 123 TIME: 12:34:56
```

```

333 CALL ENTRY (FO):
ENTRY CODE: 12 INFORMTION DIGITS: 34 SERVICE FEATUE DIGITS: 56
CALLING NUMBER: 1234567890 CALLED NUMBER: 1234567890
EVENT INFORMATION: 0
START TIME DAY: 123 TIME: 12:34:56 ELAPSED TIME: 123456

```

```

333 OUTGOING NON-EMERGENCY TRANSFER ENTRY (FB):
TRANSFER TIME DAY : 123 TIME: 12:34:56
CALL COUNTS  NANI :      0  NONI :      0
              NANIF:      0  NONOF:      0
              NLNI :      0  NLOI :      0
              NLIF :      0

```

Dump complete

ii) Output of DUMP HEX Command

```

      C1C11231  21234512  3456FA01  23123456  F0123456   12345678  90123456
78900123
      12345612  3456F301  23123456  00000000  00000000  00000000  00000000
00000000
      00000000  00000000  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA
      AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA
      AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA
      AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA
      AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA
      AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA
      AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA
      AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA  AAAAAAAAA
AAAAAAAA

```

Dump complete

NTX182AA04 Status: RTM NON RESIDENT NT COMMISSIONING SOFTWARE

ADMINISTRATION	:	
DATABASE	DUMP	F0898
MAINTENANCE AND TESTING	:	
BNR - AMA/CDR TAPE DUMP UTILITY PROG (AMATAPE)		F1044
ADMINISTRATION	:	
COMMISSIONING LINE DIAGNOSTIC		F1665
TRANSLATION OF CIRCUITS TO DIGITS DIALLED		F1682
AUTOMATIC LINE TEST COMMISSIONING		F1719
COMMISSIONING S/W UNLOAD VERIFICATION		F1720
DUMP OF OFFICE DATA FOR VERIFICATION		F1721
LINE APPARANCE TEST PROGRAM		F1722
NETWORK LINK TO LINE MODULE TESTS		F1723
LINE DATA MODIFICATION		F1724
TOPS POSITION SIMULATOR		F1725
ENHANCED TRAFFIC SIMULATOR		F1726
MAINTENANCE AND TESTING	:	
NT - AMA/CDR TAPE DUMP UTILITY PROG (AMADUMP)		F1796
ADMINISTRATION	:	
JOURNAL FILE DUMP FACILITY		F3383
TOOLS	:	
BCS22 COMMISSIONING NONRES S/W UPDATES		F6477
BCS24 COMMISSIONING NONRES S/W UPDATES		F6626

Package	NTX182AA04 NON RESIDENT NT COMMISSIONING SOFTWARE
Feature set	MAINTENANCE AND TESTING
Feature	BNR - AMA/CDR TAPE DUMP UTILITY PROG (AMATAPE)
Feature no	F1044

FEATURE SYNOPSIS

An optional non-resident utility (AMATAPE) is available for the purpose of providing a display or hard copy (dump) of the contents of AMA files produced in a LAMA or CAMA office.

The AMA Tape Dump software is accessed by loading and listing the non-res tape and typing LOAD AMATAPE.

Note: Files being dumped should be on a drive not allocated to recording.

The subcommands of the AMA tape dump utility are accessed by typing:

AMATAPE filename

Where:

filename is the name of the AMA datafile from a mounted and listed AMA tape or disk.

The DMS responds with the prompt AMATAPE >.

The subcommands associated with the AMA tape dump utility are DUMP, FILTER, DURATION and GRAPH.

For a complete description of above feature, refer to NTP 297-1001-119 Section 9.

Package	NTX182AA04 NON RESIDENT NT COMMISSIONING SOFTWARE
Feature set	ADMINISTRATION
Feature	TRANSLATION OF CIRCUITS TO DIGITS DIALLED
Feature no	F1682

FEATURE SYNOPSIS

This feature is more commonly known as the Automated Call-through Test System (ACTS). It is the contrary of Translation Verification feature (NTX055AB) resident in DMS switch. In Translation Verification, the user specifies the digits dialled and the software goes through the translation and identifies the outgoing trunk which is taken by the dialled digit. In ACTS, the user specifies the incoming and outgoing circuit and the software returns the dialling information in order to complete the call.

The Automated Call-through Test System (ACTS) consists of two main features, the Reverse Translator and the Call-through Test Plan.

The Reverse Translator (XLATE), enables the user to specify an incoming and outgoing circuit and obtain the dialling information to make the call. These calls can be line to trunk or trunk to trunk.

The second feature is the Call-through Test Plan (CTPLAN) which determines the set of calls to perform call-through testing and does a reverse translation on each.

FEATURE DESCRIPTION

a. Loading and Unloading Procedures

Loading Procedure

Many of the features of the DMS-100 Family are optional depending on the feature packages ordered by the TELCO. An example of this is the s/w related to lines. Since ACTS must be loaded into the offices which may or may not contain these optional features, it must be self-customizing. i.e. The lines portion of ACTS is only loaded if the DMS office contains lines.

The following three modules form the core of ACTS and must always be loaded as follows:

LOAD ACTSG1

LOAD ACTSCSA

LOAD ACTS

ACTS is then entered by typing at a terminal:

ACTS

The program will return with a message of the form:

yPlease load the following modules ACTSLN, ACTSIT, ACTSSC and re_enter ACTS'.

The program has determined the feature content of the DMS and asked for the corresponding optional modules of ACTS to be loaded. The optional ACTS modules are then loaded:

LOAD ACTSLN

LOAD ACTSIT

LOAD ACTSSC

etc

Re-enter ACTS by typing at a terminal:

ACTS

The program will return with the message:

yACTS VERSION x.x'

The customizing feature in ACTS can be overridden by entering:

ACTS NOCUST

Unloading Procedure

The procedure for unloading ACTS is the reverse of above. First the optional modules are unloaded as follows:

UNLOAD ACTSIT

UNLOAD ACTSLT

UNLOAD ACTSLN

UNLOAD ACTSSC

UNLOAD ACTSIS

UNLOAD ACTS250

Next the core modules are unloaded:

UNLOAD ACTS

UNLOAD ACTSCSA

UNLOAD ACTSG1

ACTS Aspects

The following are the aspects of ACTS currently available:

ASPECT	DESC	CIRCUIT TYPES SUPPORTED
-----	----	-----
ACTSIT	intertoll	it,t101,t105
ACTSLT	local trunks	ti,to,an,ir,da,rc,oc,op,oi,t2,td
ACTSIS	inc., no digits	is
ACTSSC	cama	sc,in
ACTSLN	lines	line and hunt type circuits
ACTS250	DMS250 trunks	onal,imt,dal

b) Reverse Translator (XLATE)

Syntax

XLATE <originator> <terminator>

where <originator> and <terminator> are:

LINE <dir num>

or

TRK <clli> [<ningrp>]

<dir num> is the 7 or 10 digits directory number

<clli> is the trunk common language location identifier

<ningrp> is the trunk number in group (optional)

Output

The following information is output as a result of the XLATE command:

Originating circuit information

clli or directory number

ckt location data (tmtype, tmno, tmcktno or len)

card code

signalling info (start type, pulsing type)

Dialling information

digits to dial

ani digits (if required)

Terminating circuit information

as above for originating circuit

e.g.

Originating Circuit

```

                                ...DCM...
Clli      Name      No Ckt TS      Cardcode      Sig      Start
SC2WAY    10        1  12  9      DS1S1G        MF        WK

```

Dialling Information

```

Digits to Dial      Ani Digits
8365555             06215555

```

Terminating Circuit

```

                                ...TM...
Clli      Name      Type No Ckt      Cardcode      Sig      Start
TERMCITY  802      TM8   6  12      2X88AA        DP        IM

```

Description

The XLATE command activates the reverse translator for an originating and terminating circuit.

The terminator is located in the translation tables (STDPRTCT, HNPACONT, FNPACONT, OFRT) and then a path is determined from the originator to the terminator. The path found determines the digits to be dialled. Finally the screening tables (LCASCRNC, CLSVSCRC) are checked to ensure the call will not be screened.

For the HNPACONT and FNPACONT tables, if no digits can be found to reach the route to the terminator then a TELCO message is sent indicating the route table will be searched again for the terminator, starting at the last route found.

When the digits are being made up, they will sometimes have to be expanded with yfill' digits to satisfy minimum incoming digits requirements or HNPA code type. The digit 5 is used in such cases. (The perfect 1-mean-nothing- digit).

The option DEBUG generates additional information used for debugging the reverse translator. The option ALT causes the reverse translator to consider alternate as well as direct routes to the terminator. The option OPER controls whether operator assisted calls will be counted as a successful translation. In normal use all the options would remain at their default values.

c. Call-through=Test Plan (CTPLAN)

Syntax

CTPLAN

Output

A series of test calls is output with the same format as for the XLATE command except that each call is numbered.

After all the call data is output, a list of trunk groups and pm's for which a test call could not be determined, is printed.

Description

CTPLAN activates the call selection algorithm which selects a set of calls to optimally perform the call-through tests and does a reverse translation on each.

The call selection algorithm works by sorting all the incoming and two-way trunk groups into a list of originators and all the outgoing and two-way trunk groups into a list of terminators. It then attempts to work out a call to every terminator from a prime originator(s), then a call from every originator to a prime terminator(s). This results in a fan type of call call pattern which covers the majority of paths through the translation data.

A single line to trunk call is also determined.

All the dcm's, tm2's, tm4's and tm8's in the office are also sorted into a list. This list of pm's is used to ensure a call has been determined for each pm.

d. Options

Two options can be applied to test the call selection algorithm. The option CTDEBUG generates additional debug information used for testing the call selection algorithm. The option SCRN allows certain trunk-types to be excluded from the originators and terminators lists. In normal use the options would remain at their default values.

Options

Syntax

```

OPTIONS [<option>] {NODEBUG,  DEBUG
                    NOALT,    ALT
                    NOCTDEBUG, CTDEBUG,
                    NOOPER,  OPER
                    CLEAR,

```

```

SCRN [<screening>] {INTERTOLL,
                    LOCAL,
                    LINES,
                    TANDEMIS,
                    DMS250,
                    CAMA}

```

where:

The default options are: NODEBUG, NOALT, NOCTDEBUG, NOOPER.

OPTIONS with no parameters displays the currently set options.

DEBUG displays additional information useful for debugging ACTS. See section 4.2

ALT translates using both direct and alternate routes.

CTDEBUG displays additional information for the call-through selection algorithm useful for debugging ACTS.

OPER causes translations requiring operator assistance to not be screened.

SCRN allows certain circuit types to be ignored by the call-through selection algorithm.

INTERTOLL screens trunktype IT

LOCAL screens trunktypes T0, T2, T1, TD, OC, OP, RC, AN, O1, DA, IR

CAMA screens trunktypes IN, SC

TANDEMIS screens trunktype IS

LINES screens lines

DMS250 screens trunktypes ONAL, DAL, IMT

DEBUG Option

The DEBUG option displays additional information indicating the process the reverse translator is following to work out the translation of the call. This information is useful for tracing suspected bugs in the program or the office data. The following information is displayed:

EXTERNAL TABLE NAME - This is the name of the set of data as it appears in table form on a MAP. It is the data being examined by the reverse translator at that time.

SEARCH ITEM SELECTOR (SIS)- The SIS indicates what is the target of the search into a translation table.

i.e.

SIS	Item
---	----
0	terminating circuit
1,4	path to OFRT table
2	path to FNPACONT table
3	path to HNPACONT table

DIGITS - Various digits are displayed which are used to build the final call data. These digits are usually the index into the external table being searched at that time. Note that the digit 0 appears as a 10 in these messages.

ROUTE INDEX - The route index to the terminator is displayed when located in one of the route tables (table OFRT, table HNPACON subtable ROUTEREF or table FNPACONT subtable ROUTEREF).

REINITIALIZATION MESSAGE - When the reverse translator has begun building the translation data but has reached a dead end, the message Reinitializing call data appears to indicate the search was not successful and has restarted elsewhere.

OTHER INFORMATION - Various other information is displayed depending on how the call is translated such as type of screening, min/max digits constrains, cama not authorized for a cama call etc. These messages are self-explanatory.

CTDEBUG Option

The CTDEBUG option displays additional information regarding the call selection algorithm. It is usually useful only for debugging the program.

When set, this option causes all the originators and terminators in the office (excluding lines) to be displayed. This data is derived from the TRUNK_GROUP_DATA descriptor in TRKDUL after being sorted into the originator list (incoming and two way) and the terminator list (outgoing and two way).

Also, each prime trunk group or line is shown as it is selected. The prime is the circuit for which all calls are fanned from or to.

If a circuit is selected to be part of a call but is found to be on a pm which already has a call planned, a new member in the group will be selected and a message will appear indicating the decision.

Lastly, the call data is dumped from each call whether the translation was successful or not.

Package	NTX182AA04 NON RESIDENT NT COMMISSIONING SOFTWARE
Feature set	MAINTENANCE AND TESTING
Feature	NT - AMA/CDR TAPE DUMP UTILITY PROG (AMADUMP)
Feature no	F1796

FEATURE SYNOPSIS

This non resident program (ADUMPSUB) is used to print-out (in either mnemonic or hexadecimal formats) all or selected records of an AMA/CDR/SMDR tape.

This program is used by Commissioning to perform on-site verification of AMA/CDR/SMDR system. It can also be used by certain Telco's to print out AMA billing records before the down-stream processor is set up or modified to handle DMS AMA tape format.

FEATURE DESCRIPTION

To load the program from tape, first mount and list the tape containing the necessary load file (ADUMPSLD). Then enter:

```
Copy ADUMPSFC SFDEV
Read ADUMPSFC
```

If ADUMPSFC is not available, enter:

```
Load ADUMP
```

At this point the tape containing the AMA/CDR/SMDR datafile should be mounted and listed (as a utility tape-not within the AMA subsystem).

Upon completion of testing, the program should be unloaded by entering:

```
Unload ADUMP
```

The commands currently supported by the program are:

- i) INCLUDE,
- ii) EXCLUDE,
- iii) DISPO,
- iv) DISP1,
- v) DUMP, and
- vi) LEAVE.

```
INCLUDE
```

This command is invoked with a list of AMA/CDR/SMDR record types and its function is to include the specified record types in the tape dump. The default is to include all record types.

e.g. INCLUDE [<record_code(s)>]

EXCLUDE

This command is invoked with a list of AMA/CDR/SMDR record types and its function is to exclude the specified record types from the tape dump. The default is to exclude all record types (i.e. to display only header information).

e.g. EXCLUDE [<record_code(s)>]

DISPO

This command is invoked without any parameters and its function is to display the excluded record types.

e.g. DISPO

DISP1

This command is invoked without any parameters and its function is to display the included record types.

e.g. DISP1

DUMP

This command is invoked with a non-optional parameter and an optional parameter HEX and its function is to dump the selected records in mnemonic (0= hexadecimal) format.

e.g. DUMP AMA/CDR/CDR250 [HEX]

LEAVE

This command is invoked without any parameters and its function is to exit from the program environment.

e.g. LEAVE

To obtain a brief description or a specific command (with the exception of the LEAVE command), enter:

Q <command>

where <command> is the command to be queried. The description displayed will include a functional description of the command and the parameters required to invoke it.

In addition, the program entry command (ADUMP) may be queried by entering:

Q ADUMP

The following is an example of the print out:

(i) Output of DUMP command

```
333 BLOCK HEADER ENTRY (C1C1):  
TIME STAMP DAY: 123 HOUR: 12  
OFFICE IDENTIFICATION: 123456 BLOCK COUNT: 12345
```

```
333 INCOMING NON-EMERGENCY TRANSFER ENTRY (FA):  
TRANSFER TIME DAY: 123 TIME: 12:34:56
```


Package	NTX182AA04 NON RESIDENT NT COMMISSIONING SOFTWARE
Feature set	ADMINISTRATION
Feature	JOURNAL FILE DUMP FACILITY
Feature no	F3383

FUNCTIONAL DESCRIPTION

The purpose of this feature is to allow cross BCS application of the journal file to avoid a DMO freeze. This will be accomplished by dumping the journal file from the old load in external format, using the reformat system where necessary, and datafilling it into the new load.

The non-resident CI command JFDUMP will be used to dump the journal file(s) as a sequence of datafill commands. The existing module, DMOPRO, will be used to restore this data into the new load. The external form of the data will be as defined in the old load by the data dictionary or, if a reformat is required, by the reformat system. The transfer medium will be fixed length record file(s) as supported by the FILESYS subsystem.

The intent of this feature is not to permit ALL types of DMO activity, but to allow certain types to continue during the (current) DMO freeze of a dump and restore. In particular, the following types of activity are not allowed:

- modifications to any table where the data is in any way dependent upon or related to a hardware status outside of the realm of table control.
- modifications to any data not contained in a table accessible via the table editor.

The exception to these rules is that all service order activity is allowed. This will be possible via a modification to SERVORD which will place a tuple for a phantom table in the journal file which, when datafilled, will perform the correct action regarding the hardware status of the line being modified.

The reason for the first rule has nothing to do with converting the journal file to external form, but results from problems in datafilling such tuples in the new load. The state of the hardware in the new load cannot be guaranteed to be the same as it was in the old load at the time of the original DMO (i.e. MAP activities are not recorded in the journal file). The reason for the second rule is obvious.

If it is necessary to violate the first rule, the following manual procedure may be used:

- close the current journal file via JFSTOP.
- make the necessary change(s) and manually record it(them). It(They) will have to be re-

applied exactly in the new load manually at the appropriate time. - start a NEW journal file.

In transferring this activity to the new load, datafill the JFDUMP file representing the journal file prior to the change, apply the change, and datafill the remainder. It is recommended that this procedure be avoided if at all possible since due to its manual nature it is prone to error.

Error handling by JFDUMP consists of an informatory message along with the external view of the tuple causing a problem. These messages are printed on the controlling terminal and also appear as comments in the output file. Conversion of a logical tuple to external form may not be possible in all cases. For example, given a table using old table control where a sub-table tuple is modified in any way will result in an error for the sub-table tuple if the tuple in the head table corresponding to the sub-table is subsequently deleted. The same is true for sub-sub-tables.

All errors must be investigated thoroughly before datafilling in the new load.

NTX183AA04 Status: RTM NON RESIDENT NT DATATOOLS SOFTWARE

ADMINISTRATION	:	
DATA DUMP AND RESTORE		F1666
CHANGE COMMAND CLASSES QUERY		F1729
REFORMATING OF DATA TABLE CONTENTS BETWEEN SOFTWARE LOADS		F1730
TEXT EDITOR FOR SOS		F1885
JOURNAL FILE DUMP FACILITY		F3383

Package	NTX183AA04 NON RESIDENT NT DATATOOLS SOFTWARE
Feature set	ADMINISTRATION
Feature	JOURNAL FILE DUMP FACILITY
Feature no	F3383

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applied exactly in the new load manually at the appropriate time. - start a NEW journal file.

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All errors must be investigated thoroughly before datafilling in the new load.

NTX184AA09 Status: RTM NON RESIDENT RESTRICTED SOFTWARE LAB USE

ADMINISTRATION	:	
CURRENT OCCUPANCY STATUS		F0915
PROVIDE DIRECTORY OF PP EXECUTIVE PROGRAMS		F0916
PRINTOUT LETTERS IN SYSTEM - ALL, IDLE, PROCS, OWNERS		F0918
PM MONITOR EXEC TRACE ON PM ACTIVITY BY TM TYPE		F0919
MONITOR SUBROUTINE USAGE		F0920
LEVEL 1 CAPACITY IMPROVEMENT AND MEMORY REDUCTION		F1668
TATS CTRSIM		F1669
TATS TRAFSIM		F1670
I/O SYSTEM STRAY NODE REMOVAL TOOL		F1671
LOG/REPORT EDITING UTILITY		F1672
IO FLOW CONTROL MODIFICATIONS		F1673
SYSTEM AUDIT PACKAGE - VERSION 1		F1674
PROGRAM STORE-OPTIMIZED OPCODES		F1675
S/W PROTECTION FOR NON-RES TAPES		F2423
MAINTENANCE AND TESTING	:	
DUMP AND RESTORE ROBUSTNESS		F6499
ADMINISTRATION	:	
ENHANCED TCALLCT FOR POSSIBLE FIELD USE		F6504
OLD TABLE CONTROL ENHANCEMENTS		F6511

Package	NTX184AA09 NON RESIDENT RESTRICTED SOFTWARE LAB USE ONLY
Feature set	ADMINISTRATION
Feature	S/W PROTECTION FOR NON-RES TAPES
Feature no	F2423

FEATURE DESCRIPTION

PROTECTION LEVELS

Two levels of protection are implemented. Protection is either 'ON' or 'OFF'. Protection 'OFF' is a lab (captive office) environment in which a load is being built and tested. Protection 'ON' is a telco office environment. The capabilities associated with loading modules at each level of protection are discussed below.

EVENTS

SPECIFYING WHICH MODULES MAY BE LOADED BY THE CUSTOMER.

All modules to be allowed to be loaded on a telco switch must be specified at the time the load is being built. It should be noted that this does not only include the customer non-res but any module be it resident, support etc. The specification may be done by:

- a) loading the module then unloading it,
- b) using the ENABLE command to indicate which module(s) is now to be available on the telco switch.

Future modifications may be made with respect to which modules may be loaded on the telco switch by using the same ENABLE command.

TURNING THE PROTECTION FEATURE ON.

This is done in the lab environment before the load is sent to the telco office. An option to the ENABLE command, to be mentioned below, indicates that the list of modules presently allowed to be loaded is to be frozen and protection turned 'ON'. This is a non-reversible process. Once protection is turned 'ON', it may not be turned 'OFF'. This does not imply that no changes may now be made to the list of modules to be allowed to be loaded. Changes may be made to the list at any time by using the ENABLE command.

LOADING A MODULE.

The ability to load a module depends on the protection level. If protection is 'OFF', any module may be loaded at any time. If protection is 'ON', only modules which have been specified as being able to be loaded on the customer switch will be allowed to be loaded. The following assumes a protection state of 'ON'. ALL modules which are to be allowed to be loaded on the switch must be specified as such. The procedure of attempting to load a module which has not been specified as being able to be loaded will fail. Again, only modules specified as being able to be loaded on a switch will be loaded, others will NOT.

COPYING NON-RES TAPES.

It was a concern that if the customer copied the non-res tape then it could be used on another switch and would thereby be accessible free of charge. This is no longer a problem. No provision has been made to stop the customer from copying tapes, however, a copied tape will be of no use to a switch in which the modules have not been specified as being able to be loaded. Therefore, copies of other modules from other switches may not be used since they will NOT be able to be loaded if not specified as being able to be loaded.

Package	NTX184AA09 NON RESIDENT RESTRICTED SOFTWARE LAB USE ONLY
Feature set	MAINTENANCE AND TESTING
Feature	DUMP AND RESTORE ROBUSTNESS
Feature no	F6499

FEATURE SYNOPSIS

This feature modifies the table control code of several tables to remove problems encountered over dump and restore. It also removes the EXTEND command from some old table control tables and makes old table control more robust.

FEATURE DESCRIPTION

The EXTEND command can cause corrupted tables and incorrect table counts for the used and allocated space.

Each old table control table and subtable is examined individually. For each table, space will either be allocated at initialization time or dynamically as needed. Either way all storage allocation is invisible to the user. The old tables can be grouped into several general categories:

- tables which have a fixed size,
- tables which allocate all needed space at initialization,
- tables which already have internal allocation techniques,
- tables which need to allocate space as the table grows.

Old table control tables can also become corrupted in certain cases when more than one user is modifying a table at once. This problem is fixed by ensuring a users private view of the table is always consistent with the actual table. This involves more reads and writes of the users local table information to and from the DMS database. These changes are transparent to the user.

Package	NTX184AA09 NON RESIDENT RESTRICTED SOFTWARE LAB USE ONLY
Feature set	ADMINISTRATION
Feature	OLD TABLE CONTROL ENHANCEMENTS
Feature no	F6511

FEATURE SYNOPSIS

This activity modifies the storage allocation code for tables using old table control. The EXT command is removed for these tables to reduce opportunities for table corruption. All storage allocation is made invisible to the user by this activity. The table editor command 'EXTEND' will be obsoleted. This activity is a continuation of the activity dump and restore robustness (AG0080) which was introduced in BCS-23.

FEATURE DESCRIPTION

Old table control tables can become corrupted by the EXTEND command. The table size and used tuple count may not be updated correctly when resource allocation is changed.

Resource allocation is examined on a per table basis. Some tables will allow only an initial extension. For these tables, all store can be allocated at initialization time. Other tables require that resources be allocated as the table grows. For these tables, resource allocation must be done dynamically. In either case, extensions on all old table control tables will be handled internally, eliminating the need for the EXTEND table editor command.

Ref: DDOC AF0788

NTX186AA06 Status: RTM EQUAL ACCESS END OFFICE

EQUAL ACCESS END OFFICE(EAEO) :	
EAEO - TRANSLATION AND CARRIER SCREENING	F1731
EAEO - TRUNK TO AT & IC	F1732
EAEO - NEW TREATMENTS	F1733
EAEO - ORIGINATING AND TERMINATING BILLING	F1734
EAEO - NEW LOGS	F1736
EAEO - ABBREVIATED DIAING	F1737
FEATURE GROUP C AND D COMPATIBILITY	F3860
EQUAL ACCESS ON IBN/DATAPATH	F3908
OVERLAP CARRIER SELLECTION	F3920
EA - EXPANDED TOLL DENIAL	F5424
EA - CC REAL TIME IMPROVEMENT	F5425
EAEO - 00 MINUS DIALING ROUTED VIA PIC	F5489
EAEO - P2(PX) TRUNK COMPATIBILITY	F5490
EQUAL ACCESS END OFFICE (EAEO) :	
CORRIDOR 611 ROUTING AND BILLING	F5566
EAEO - IC/INC EVENT STATUS ENHANCEMENT	F5572
EQUAL ACCESS END OFFICE(EAEO) :	
EA: OPTIONAL/SAC CODES	F5677
CIRCLE DIGIT EQUAL ACCESS COMPATIBILITY	F5683
OMS - PIC AND NON PIC CALLS PER IC/INC	F6244

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - TRANSLATION AND CARRIER SCREENING
Feature no	F1731

FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the requirements of the Equal Access End Office (EAEO) in DMS. In particular, this feature implements the translation and carrier screening.

The territory of BOC's has been divided up into Local Access Transport Areas (LATA).

The switch has the ability to disallow traffic to any carrier based on the following call attributes: inter/intraLATA, inter/intrastate, domestic/international.

The Equal Access (EA) Plan utilizes a new dialling plan to gain access to inter/intraLATA carriers (IC).

In an EAEO if a subscriber has not chosen a PIC (Primary InterLATA Carrier) and has not dialled 10XXX and if the call is a toll call and that office has chosen to have a default carrier, then the call will be routed to that carrier, otherwise the call will be blocked (See F1733). There is one exception to this and that is the subscriber who has decided not to have a PIC, however, he/she does not want to default to the office default carrier. This person will have a PIC of sorts and the carrier name will be NULLCAR. The subscriber must explicitly dial 10XXX for each call.

FEATURE DESCRIPTION

New Dialling Plan

The EAEO can receive any of the following sequences of digits from a subscriber:

Incoming Digits -----	Call Type Possibilities -----
a) 7/10 digits	inter/intrastate inter/intraLATA local/toll
b) (1)/0 +7/10 digits	inter/intrastate inter/intraLATA toll PIC
c) 10XXX +(1)/0+7/10 digits	inter/intrastate inter/intraLATA toll
d) 011/01 + CC + NN	international PINC
e) 10XXX + 011/01 + CC + NN	international

- f) 0 intraLATA operator
- g) 10XXX + 0 interLATA operator
- h) (1)/0 + 10 digits PIC call within world zone 1, but outside the continental US
- i) 10XXX + (1)/0 + 10 digits call within word zone 1, but outside the continental U.S.
- j) 10XXX + # abbreviated dial (see F1737)
- k) 9501XXX from nonconforming end office

XXX digits represent the carrier which the subscriber intends to patronize.

CC stands for country code and NN is the national number of the called party.

Translation and Carrier Screening

To perform the necessary digit translation and carrier screening on these types of calls, it will be essential to distinguish between EA and all other traffic. Also, since carriers can be restricted to inter/intrastate, inter/intraLATA, or domestic/international traffic as well as by access arrangement (where the possibilities are: Interim, Equal Access Plan, Transition, or None see F3437) these four attributes must be determined about the call and then the carrier information verified. In other words, it is necessary to determine whether the carrier chosen by the subscriber (eg. 10XXX, PIC, or default carrier) is indeed a candidate for the call that has been dialled. Data stored against the carrier will indicate whether a carrier can handle these types of calls inter/intrastate, inter/intraLATA, and domestic/international.

There are also different types of operator services that a carrier can offer, so when an operator assisted call is dialled the corresponding carrier information needs to be checked and the operator route id fetched and set. A carrier has four options to offer subscribers for operator services: EA, BOC, TSPS, or none. If the carrier has chosen EA, BOC, or TSPS, the operator route id will directly route the call to that operator position. The option none will cause a treatment to be set (See F1733)

Abbreviated Dialling Plan 1 (AD1) may or may not be available from a carrier, thus that information must also be evaluated.

References

For other EAEO features see F1732-F1738 and F3737-F3739
For AT features see F1740, F3437-F3441, F3705
Reference document for EA is FSD 20-24-0000
FDOC C1124

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - TRUNK TO AT & IC
Feature no	F1732

FEATURE SYNOPSIS

Introduction

The equal access plan brought about by the divestiture of AT&T means that a telephone subscriber will subscribe to common carriers to complete long distance calls previously handled exclusively by AT&T.

The areas served by the BOCs are divided into non-overlapping Local Access and Transport Areas (LATA). Traffic within a LATA will be served by Intra Lata Carriers and traffic between Latas will be served by Inter Lata Carriers (IC). International traffic will be served by International Carrier (INC) or by an Inter Lata Carrier serving an INC.

The purpose of this feature is to implement special trunk signaling requirement, as laid out in FSD 20-24-0000, for the DMS-100 family of equal access end offices (EAEO) connecting to an IC either directly or via an Access Tandem switch (AT). This feature is a subset of the requirements for the the Equal Access End Office (EAEO). Other requirements have been implemented in features F1731-F1738 and F3737-F3739. Equal Access implementation for the AT is found in features F1740, F3437-F3441, F3705.

In the case where a direct route exists between an EAEO and an IC, the connection will be provided by a new trunk group, ATC, developed in a previous feature (FEAT F3438). Where no direct route exists, the EAEO will communicate with the IC via an AT. The connection path between the EAEO and the AT will be served by existing Intertoll and Supercama trunk groups. The path connecting the AT to the IC will be served by the currently existing ATC trunk group.

The primary choice in routing an Equal Access call will be over an ATC trunk if a direct route exists between an EAEO and a carrier. If this route is congested, traffic will overflow to the AT via an Intertoll or Supercama trunk.

FEATURE DESCRIPTIONNew Dialing Plan

The equal access plan calls for a new dialling plan and a new trunk signalling plan in order for the customer to successfully complete an equal access call.

For an EAE0 connected to an IC via an AT, although the trunks connecting the EAE0 to the AT will be the existing IT or SC trunks, the mode of outpulsing on an equal access call will be different from that of an intertoll call.

The following table outlines the dialling plan and the outpulsing sequence for equal access calls from an EAE0:

<u>CUSTOMER DIALS</u>	<u>SITUATION</u>	<u>EAE0 OUTPULSING SEQUENCE TO AT</u>
1) 10XXX+(0/1)+7/10dig	inter/intrastate inter/interlata toll via AT.	KP+0ZZ+XXX+ST KP+II+ANI(3/10 digits)+ST KP+(0)+7/10digits + ST
2) 10XXX+#	abbreviated dial	KP+0ZZ+XXX+ST KP+II+ANI(3/10digits)+ST'
3) 950-1XXX	dialed from an EAE0	KP+0ZZ+XXX+ST KP+II+ANI(3/10 digits)+ST
4) 10XXX+011+CC+NN	international	KP+1NX+XXX+CCC+ST KP+II+ANI(3/10digits)+ST KP+CC+NN+ST
5) 10XXX+01+CC+NN	international	KP+1N'X+XXX+CCC+ST KP+II+ANI(3/10digits)+ST KP+CC+NN+ST
6) 10XXX+0+10digits	within world zone 1 but outside cont- inental U.S. (operator assisted).	KP+1N'X+XXX+01R+ST KP+II+ANI(3/10digits)+ST KP+0+10digits+ST
7) 10XXX+1+10digits	within world zone 1 but outside cont- inental U.S.A. (direct dialed).	KP+1NX+XXX+01R+ST KP+II+ANI(3/10digits)+ST KP+10digits+ST
8) 10XXX+#	cut through to IC/INC	KP+1NX+XXX+000+ST KP+II+ANI(3/10digits)+ST'
9) 10XXX+0	o_call to IC operator.	KP+1N'X+XXX+000+ST KP+II+ANI(3/10digits)+ST KP+0+ST

NOTE:

XXX signify carrier designation.

OZZ digits are chosen from spare toll center codes in the LATA and signify to the AT that translation of the XXX digits are necessary in order to derive the carrier identity. These digits also signify the type of call to the AT, so that the AT may route calls over more than one trunk group to an IC or INC.

1NX/1N'X digits are used in the same fashion as the OZZ by an INC. N signifies non-operator assisted call and N' signifies operator assisted calls. A carrier is allowed up to four of these three digit codes.

II digits are information digits, signifying ONI, ANI failure, hotel without room identification, coinless, hospital, interlata restricted, test call etc. See FSD 20-24-0000 for a full list.

CCC is country code padded to three digits with leading zeroes.

01R is a three digit sequence consisting of the 1 country code padded with a leading zero and with the R available to distinguish between calls to various regions, based on the NPA, outside the continental U.S. but in world zone 1.

NN signifies the national number.

In the above table the spilling of the ANI digits will depend on whether the carrier needs it or not. This information will be specified in customer table CARRINFO. Where ANI is required by the carrier but cannot be determined, eg. in the case of a multiparty line, only KP+NPA+ST will be outpulsed. Where ANI is not required by the carrier, only KP+ST will be outpulsed.

EAEO without direct IC trunks

Once an equal access call is originated from an equal access end office, translation will determine if the call is a valid Equal Access call. If it is a valid call, the EAEO will seize an outgoing intertoll or supercama trunk. On receiving a wink as a response to the seizure, the EAEO will outpulse the first set of digits shown in Table 1, depending on the dialled digits. The first set of digits contain carrier information which is translated by the AT in order to seize an outgoing ATC trunk to a carrier. Having seized an ATC trunk, the AT receives a wink back from the IC as a response to the seizure which it regenerates to the EAEO as well as cuts through connection between the EAEO and the IC. On receiving this wink the EAEO spills the ANI digits if required by the carrier. If no ANI is required only KP+ST is outpulsed. ANI digits may be 3 or 10 digits, depending on whether the originating party can be identified or not. If

the originating party can be identified, the 10 digits comprising the area code and the billing number is spilled. In cases eg. multiparty lines where the originating party cannot be identified, the 3 digit area code is spilled.

Having spilled the ANI the EAEO checks if dialling is complete and outpulses the called digits to the IC and cuts through talking path to the IC.

The IC on receiving all the digits passes an acknowledgement wink to the AT, which the AT regenerates and propagates to the EAEO. The call is then routed by the IC to the terminating end.

Once the called party answers, offhook is passed from the terminating end office to the terminating AT to the IC to the originating AT and finally to the originating EAEO. If the called party disconnects first, onhook is passed to the originating EAEO via the terminating AT, the IC and the originating AT. If the calling party does not disconnect within 11-40 sec. after the called party goes onhook, the terminating AT will time out and onhook will be passed to the terminating end office and all connections in the terminating LATA released.

If the calling party disconnects within 11-40sec., onhook is passed from the originating EAEO to the AT to the IC and all connections released in the originating LATA. Also, onhook is passed from the IC to the terminating AT to the terminating end office and all connections to the terminating LATA released. If onhook is not passed from the IC to the terminating end office, the terminating AT times out within 11-40 sec. onhook is passed to the terminating end office and all connections in the terminating LATA released.

There is a slight variation in the sequence described above if the call happens to be an international call and the IC in question happens to serve an INC. In such a case the first wink from the IC regenerated by the AT and propagated to the EAEO will not initiate subsequent outpulsing. This wink is used for AMA purposes. Also, in this case, it is the AT which outpulses the carrier information to the IC, having received it from the EAEO. Only at the arrival of the next wink may outpulsing commence.

EAEO with direct trunk to IC

An equal access end office may be directly connected to an IC over an ATC trunk. After initial translation and screening of the dialed digits, the EAEO will seize an outgoing ATC trunk and receive a wink from the IC as a response to the seizure. The number of stages involved in outpulsing will depend on the digits dialled.

References

FSD 20-24-0000

FDOC C1125

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - NEW TREATMENTS
Feature no	F1733

FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the requirements for the Equal Access End Office (EAEO) in the DMS-100 family. In particular, this feature implements the treatments needed in call failure conditions at the EAEO on Equal Access calls.

It is to be noted that a distinction is made between a treatment and a disposition for the treatment. A treatment is a software generated reaction to a call failure condition and a disposition is the user defined action in response to the problem. For example, the TELCO, as an action may supply the subscriber with either a tone or an announce -ment.

FEATURE DESCRIPTION

EQUAL ACCESS TREATMENTS AND RECOMMENDED DISPOSITION

We will split this up into two categories, FAILURE CONDITIONS THAT NEED NEW TREATMENTS and FAILURE CONDITIONS THAT CAN BE HANDLED BY EXISTING TREATMENTS.

The format for these will be as follows: nn. Failure Condition

- a. Treatment
- b. FSD recommended disposition

FAILURE CONDITIONS THAT NEED NEW TREATMENTS

1. Vacant or Changed IC/INC Code/ 10XXX (INC XXX) + domestic.
 - a. CACE
 - b. Carrier Access Code In Error announcement.
2. 10XXX-dialed, Should Be 950-1XXX
 - a. D950
 - b. DIAL 950 announcement.
The occinfo table for carrier data, in this case will have the 'access' field set to 'INTERIM'.
3. 950-1XXX Dialed Should Be 10XXX
 - a. N950
 - b. D0 Not Dial 950 announcement.
The occinfo table for carrier data, in this case will have the 'access' field set to 'EAP'.
4. Inter Lata Restriction
 - a. ILRS
 - b. Dialling Restriction announcement.

5. 10XXX not to be dialled when subscriber has a PIC.
 - a. NACD
 - b. Do Not Dial 10XXX announcement.

6. Must dial 10XXX.
 - a. DACD
 - b. Vacant code announcement.

The DMS100F utilizes the DRAM (Digital Recorded Announcement Machine) to deliver announcements to a subscriber. This machine is flexible so that a TELCO may record customised announcement to suit its convenience. However, a list of AT&T announcements regarding the above situations has been reproduced below.

TREATMENT -----	ANNOUNCEMENT TEXT -----
D950	We're sorry, the carrier access code you dialed must be preceded by the digits 950. Please hang up and try your call again.
N950	We're sorry, it is not necessary to dial the digits 950 before dialing your carrier access code. Please hang up and dial your call again.
ILRS	We're sorry, your call cannot be completed as dialed from the phone you are using. Please read your instruction card or call your operator to help you.
NACD	We're sorry, it is not necessary to dial a carrier access code for the number you have dialed. Please hang up and dial your call again.
DACD	We're sorry, it is necessary to dial a carrier access code for the number you have dialed. Please hang up and dial your call again.
CACE	We're sorry, the number you dialed cannot be reached with the carrier access code you dialed. Please check the code and dial again or call your carrier for assistance.

FAILURE CONDITIONS THAT DO NOT NEED NEW TREATMENTS

1. EAEO Does Not Get AT Wink
 - a. Signal_Time_Out_BOC (STOB)

- b. Reorder BOC Announcement
- 2. EAEO Does Not Get IC/INC Wink(s)
 - a. Signal_Time_Out_IC_INC (STOC)
 - b. Reorder IC/INC Announcement
- 3. 10XXX+# (XXX not specified AD1)
 - a. VACT
 - b. Vacant Code Announcement.
- 4. 10XXX + SAC or N11 (except 911)
 - a. VACT
 - b. Vacant Code Announcement.

There exist two other call failure conditions that do not need new treatments. They are:

- 1. All trunks busy EAEO to IC/INC.
- 2. All trunks busy EAEO to AT.

These are handled by special announcements at the end of the route lists. In such cases the disposition will be 'no circuit' resulting in 'no circuit' announcement.

To differentiate between vacant code treatment and no circuit treatments in the Equal Access case, from the regular VACT and NCKT treatments, new SIT (special Information Tones) will be assigned to each when dealing with the Equal Access environment.

This feature will introduce the new treatments described above in order to advise the subscriber of a call failure condition and to instruct the subscriber what action to take in order to successfully complete a call, under the Equal Access plan.

References

FSD 20-24-0000
FDOC C1129

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - ORIGINATING AND TERMINATING BILLING
Feature no	F1734

FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the requirements for the Equal Access End Office (EAEO) in DMS-100F. In particular, this feature implements the terminating and originating billing done at the EAEO.

To explain the scope of this feature requires an understanding that the EAEO may be connected to an Interexchange Carrier (IC) either directly (over an ATC trunk) or via an Access Tandem (AT) office. This feature covers originating billing for both cases and terminating billing for the direct connection case. Terminating billing in the case where connection is via an AT is covered in F1740. All billing records produced in this implementation will be in the standard AT&T AMA format.

The remainder of this document will discuss separately the two sub-topics of billing for equal access implementation at the EAEO:

- 1) Originating Billing
- 2) Terminating Billing

At the end of this document is an Exceptions section which outlines those specifications in FSD 20-24-0000 which are not implemented in this feature.

FEATURE DESCRIPTION

ORIGINATING BILLING

All equal access calls destined for an IC/INC need to be recorded at the originating EAEO via an originating access record. If an IC/INC is providing outWATS services, an interLATA WATS access record will be output (see call code 114) as the originating access record. Otherwise, an InterLATA Station Paid Record will fill the bill and is assigned as call code 110 with the following data:

110 InterLATA Station Paid (Originating Access Record)

Structure Code 00625
Call Type
Sensor Type
Sensor Identification
Recording Office Type

Recording Office Identification
Date of Answer
Timing Indicator
Study Indicator
Answer Indicator
Service Observed, Traffic Sampled
Operator Action
Service Feature
Originating NPA
Originating Number
Overseas Indicator
Terminating NPA
Terminating Number
Answer Time
Elapsed Time
* IC/INC Prefix
* Carrier Connect Date
* Carrier Connect Time
* Elapsed Time from Carrier Connect
* IC/INC Call Event Status
* Trunk Group Number
* Routing Indicator
* Dialing Indicator
* ANI Indicator

There is one additional variation (also call code 110) on this record:

Structure Code 00627
InterLATA, Long Duration
(all the fields in structure code 00625)
Plus:
Present Date
Present Time

* The fields marked with an asterisk directly apply to the equal access implementation but were previously added to the DMS-100F AMA system for ENFIA B and ENFIA C traffic (see F2494 and F2496).

If the call is an INWATS call, the Terminating NPA and Terminating Number fields will contain the 800 number being called.

Calls which are to be routed to an International Carrier (INC) are also recorded at the originating EAEO with an InterLATA Station Paid record (call code 110); however, the Overseas Indicator will specify the number of digits dialed whereas in the IC case this field only specifies either 0 (not an overseas call - NPA dialed) or 1 (not an overseas call -

NPA not dialed). DMS-100F assumes that if the translation system is international that the call is an overseas call.

In the case where an INC's traffic is routed via an IC, the INC's prefix will be the prefix that will be dialed (or derived from a customer's PIC). The originating access record (call code 110) will, therefore, contain the INC's identification in the IC/INC Prefix field.

If an IC/INC is providing outWATS services, an InterLATA WATS originating access record will be output instead of the call code 110 record described above. This record will be call code 114.

114 InterLATA WATS, Billing Number

Structure Code 00629
(All the fields in structure code 00625)
Plus:
WATS Indicator
WATS Band or Type Indicator

There is one additional variation (also call code 114) on this record:

Structure Code 00633
InterLATA, Long Duration
(All the fields in structure code 00629)
Plus:
Present Date
Present Time

These call code and structure codes must be added. There are no new fields to be added for this record.

In the case where Line Usage Studies (LUS) are designated on a line which is originating an InterLATA call, the selection of a call code is unaffected (i.e. it will be one of call code 110 or 114). The Study Indicator of whichever record is appropriate will mark the call as one originating from a LUS line.

120 Originating LATA Overflow Counts

Structure Code 00655
Call Type
Sensor Type
Sensor Identification
Recording Office Type

Recording Office Identification
 Date
 Time
 IC/INC Prefix
 Overflow Peg Count
 IC/INC Prefix
 Overflow Peg Count
 IC/INC Prefix
 Overflow Peg Count
 IC/INC Prefix
 Overflow Peg Count

Overflow peg counts are to be kept on a per IC/INC basis. An overflow peg count for a particular IC/INC is incremented whenever a call cannot be delivered to that IC/INC because no outgoing trunk is available. In particular, an overflow must only be pegged when direct ATC trunks are the only ones that exist to the IC/INC (i.e. there is no possibility of routing to that IC via an AT). This will require that route lists that are to be datafilled with only ATC trunks have a special CLLI at the end of the route list to indicate that the end has been reached and, hence, an overflow count is to be pegged.

The overflow record (call code 120) will contain four IC/INC overflow counts. The number of records output at any given time will vary - one for every four IC/INC overflow counts in a given period. Any unused fields at the end of the final record will contain zeros. The scheduling for output of these records will be done by adding an option to table AMAOPTS called EQUAL_ACCESS_OVERFLOW which will allow the customer to schedule the periodicity of output.

TERMINATING BILLING

As mentioned above, this feature implements terminating billing for the case where a call enters the LATA directly to the EAEO without first going through an AT. Therefore a terminating access record will be made for every equal access call that arrives at the EAEO directly from the carrier via the dedicated trunk group ATC. More information on this trunk group can be found in F3438.

In DMS-100F, terminating LAMA records are made only when the call has been successfully completed unless UNANS_LOCAL parm in table AMAOPTS is turned on. To record unanswered terminating calls, UNANS_LOCAL will need to be turned on and the call codes will need to be included in table ATTCODES. Unless this is done, no AMA record will be made when the call is not answered.

The FSD requires that terminating access recording must have the capability to be turned on and off. This will be done by adding an option to table AMAOPTS called TERM_ACCESS_RECORDING. more details on this.

119 Terminating Access Record

Structure Code 00653
(All the fields in structure code 00625)
Except:
 Calling NPA
 Calling Number
 Dialing Indicator
 ANI Indicator

There is one additional variation (also call code 119) on this record:

Structure Code 00654
InterLATA, Long Duration
(All the fields in structure code 00653)
Plus:
 Present Date
 Present Time

This record was previously implemented in F1740 for terminating billing at the AT.

In the case where an INC's traffic is routed via an IC, the terminating IC's prefix will be recorded and will be derived from the trunk group data. The terminating access record (call code 119) will, therefore, contain the IC's identification in the IC/INC Prefix field.

There is one situation where an equal access call must make a second billing record at a terminating EAEO in addition to the terminating access record. This occurs when an equal access call is routed directly from the IC to the EAEO. The record is

Terminating INWATS Record (call code 008)

If the terminating line is marked for INWATS this record will be produced along with the terminating access record. This record will also be produced at the terminating EAEO when the call is routed via an AT, however, the terminating access record will be produced at the AT.

Billing Performance Measurements

In addition to access and overflow records, tracer records must be output to keep track of billing system performance. Separate counts will be kept for four different categories:

- 1) InterLATA Records lost
- 2) IntraLATA Records lost
- 3) InterLATA Records recorded
- 4) IntraLATA Records recorded

Exceptions

The following specifications in FSD 20-24-0000 are not implemented in this feature:

- 1) Customer Identification Records
DMS-100F does not currently support customer identification. The records will be implemented if this feature is implemented.
- 2) WATS Administrative Information Records
Neither the FSD nor LSSGR Sect. 8.1 (Billing) defines this record. Implementation will be considered when specifications are available.
- 3) AFR (Automatic Flexible Routing) Records
Not supported by DMS-100F.
- 4) CSDC (Circuit Switched Data Capability) Records
Not supported by DMS-100F.
- 5) InterLATA WATS, Station Detail Records
Not supported by DMS-100F.
- 6) SST (Short Supervisory Transition) Records
Not supported by DMS-100F in local offices.
- 7) Terminating Line Usage Study Record
This record will not be produced in addition to the terminating access record when the call terminates directly to the EAEO. DMS-100F selects the terminating access record as a higher priority record and outputs it only.

References

FSD 20-24-0000
FDOC C1126

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - NEW LOGS
Feature no	F1736

FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the requirements for the Equal Access End Office (EAEO) and Access Tandem (AT) in DMS. In particular, this feature implements the remainder of the current requirements for trunk log reports.

FEATURE DESCRIPTION

It is necessary to provide enough information in the log report to uniquely associate the log report with the trunk and the particular IC/INC involved. This information is needed so that proper analysis of these log reports can be made by remote maintenance systems. Presently, DMS makes log reports when expected winks are not received. This log is called an 'OUTPULSING TRBL' log (TRK121). This log has already been modified to meet the needs of the AT. (See feature F3441.) This modification also handles the EAEO case. This log was modified so that the carrier name would be output in the message.

DMS log reports also cover state changes of a trunk. These logs are called 'LOCKOUT ON' (TRK110) and 'LOCKOUT OFF' (TRK112) reports and will also be modified to include the carrier name.

DMS also has several other trunk log reports that will be modified to include a carrier name. These are:

- 1) ROUTING TRBL (TRK111): This report indicates that a trouble was encountered while routing a call to its destination.
- 2) MF RECEP TRBL (TRK116): This report indicates that a digit reception problem was encountered during MF reception.
- 3) MF PERM SIG (TRK117): This report indicates that a permanent signal condition was encountered while waiting for called digits on an MF incoming trunk.
- 4) INTEGRITY TRBL (TRK122): This report is generated to indicate loss of integrity on the specified connection.

References

FSD 20-24-0000
FDOC BC1130

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - ABBREVIATED DIAING
Feature no	F1737

FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the requirements for the Equal Access End Office(EAEO) in DMS. In particular, this feature implements the abbreviated dialling enhancements needed in the equal access environment.

FEATURE DESCRIPTION

Presently, abbreviated dialling is accomplished in DMS by the line options SC1 (one digit, 2-9, speed calling codes) and SC2 (two digit, 20-49, speed calling codes). In both of these cases the maximum number of digits that can be stored against a speed calling code is twelve. A subscriber in an EAEO who desires to have the speed calling option on his line will have, in addition to the present speed calling capabilities, the ability to:

dial 10XXX + N(N) where N or NN is a speed calling code previously assigned.

This enhancement produces a situation similar to the one that exists today. Presently only twelve digits may be stored against a speed calling code. International numbers themselves can have as many as 12 digits and when added to either the 01 or 011 digits exceeds the limit of 12. Thus option one has no more limitations than what already exist today with SC1 or SC2.

It should be mentioned that if the customer has a PIC and wishes to use speed calling then he does not need to dial 10XXX in addition to the speed calling digit(s) unless he wants the call to be routed to a carrier other than his PIC.

References

FSD 20-24-0000
FDOC C1131

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	FEATURE GROUP C AND D COMPATIBILITY
Feature no	F3860

FEATURE SYNOPSIS

This feature expands the capabilities of Equal Access. It makes it possible to specify feature group C (FGC) signalling access to common carriers while retaining the feature group D (FGD) signalling plan for all other carriers.

FEATURE DESCRIPTION

Dialing

FGD dialing presently allows carriers that are equipped with the Equal Access Plan (EAP) signalling format to dial the following sequences of digits:

1. (10XXX) + (0/1) + 7/10 digits
2. (10XXX) + 01/011 + CC + NN
3. 10XXX + #
4. 10XXX + (1 or 2 digit speed calling code)
5. 10XXX + 0
6. 950-YXXX

Any of the above dialing sequences lets the subscriber access the desired carrier he wishes the call to be routed through. The signalling used presently on these calls is FGD signalling which is explained in detail in feature F3438 and F1732. This feature permits common carriers to be accessed using FGC signalling. The types of trunks that can be used are ATC (direct connections), Intertoll (IT-tandem connections) and OP (calls routed to TSPS). To activate this feature, the appropriate entry in table OCCINFO must have ACCESS equal to FGC. If at any time it is necessary to change to FGD signalling then ACCESS must be changed to EAP (or TRANS if 950-YXXX calls are to be carried). There are no restrictions with respect to using a FGC carrier as a customer's Primary Interlata Carrier (PIC) or as the office default carrier (specified in table OFCENG as DEFAULT_CARRIER_OR_TREAT).

Cut-through calls (10XXX+# and 950+YXXX) are not permitted to be handled by a FGC carrier. These calls will receive vacant code treatment.

Translation and routing of these calls is handled exactly as FGD calls. Information about translation and routing can be found in feature F1731.

SIGNALLING

All calls routed to a carrier setup with FGC access use FGC signalling. This is conventional pre-divestiture signalling. On domestic calls, seize the outgoing trunk, wait for acknowledgment of seizure, outpulse called number, then wait for answer. On international calls, the sequence is the same as it is handled today, i.e., two-stage outpulsing. There are no changes to signalling except for calls to TSPS. Signalling differences to TSPS will be discussed later in this document.

BILLING

It is required for calls to carriers with access of FGC to not only have the capability to have FGD dialling but also FGD billing. FGD billing is described in detail in features F1740 and F1734. The main difference between FGC and FGD billing is that the latter contains several additional fields used to identify information dealing with the carrier. The only one that changes in this implementation is the field CARRIER_CONNECT_TIME.

This field is designed to contain the time that the carrier first becomes involved in the call, i.e. the carrier responding to seizure on an incoming trunk from an equal access end office (EAEO) or an Access Tandem (AT) constitutes carrier connect. When FGD dialling is used that wink which constitutes carrier connect is passed back to the end office and a time stamp is taken and used in the billing record.

When FGC signalling is used, the wink from the carrier constituting carrier connect is the wink responding to seizure of the trunk. A time stamp is taken at the CC when it receives the message incoming from the peripheral that results from the wink.

FGC signalling also entails calls to TSPS. The equal access requirements for TSPS include the two following changes to be made.

1. Calls belonging to the BOC (intralata calls and 0-) ST' should be sent instead of ST.
2. Two ANI information digits are sent instead of one. These two digit codes can be found in FSD 20-24-0000.

This feature provides both of these capabilities on calls to TSPS. In addition, it is possible for some TSPS installations to be operating with an older generic that cannot accept two information digits and the ST' digits instead of ST for BOC calls. Thus a new field is added to the OP trunk group data called DBLANIDG (double ani information digits) which is set to Y or N. If it is set to Y this means that two information digits will be sent, otherwise one. All non equal access environments should set this field to N. By providing this data on a per trunk group basis, it will be possible to send two information digits only when that trunk group is going to an upgraded TSPS. Also if the field is set to Y, calls going to the BOC operator will have ST' following the ANI digit sequence instead of ST. This feature is supported only on direct trunks from the end office to TSPS.

OMs and TSMS

The OMs that are used presently for using pre-divestiture signalling will still work for calls to FGC carriers. The OM group EACARR will not support FGC carriers as the fields for that OM deal with signalling irregularities of FGD carriers and would not be valid information for FGC carriers. Feature F1735 is providing overflow count OMs for the combined traffic trunk groups between the EAEO and the AT. This feature will work for FGC carriers also. Features F3737 to F3739 are providing TSMS for equal access calls. These features will also work for FGC carriers. This feature will not support EATSMS or OMs for traffic owned by the BOC, as traffic routed to BOC trunk groups are not equal access calls.

LOGS

The normal trunk logs will be supported for FGC carriers. In addition the logs changed in features F3441 and F1736 will be available for ATC trunk groups. These logs have an indication of which carrier the call was routed to and are supported only for direct trunks to the carrier.

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EQUAL ACCESS ON IBN/DATAPATH
Feature no	F3908

FEATURE SYNOPSIS

The purpose of this feature is to provide equal access capabilities to IBN stations and incoming trunks. The IBN stations include:

- 1) attendant console
- 2) data unit (DU)
- 3) p-phone set
- 4) standard IB 500/2500 set

These stations may reside in a dedicated SL-100 PBX or be part of a DMS-100 IBN customer group. (i.e. CENTREX configuration.)

Access to a carrier (IC/INC) is obtained by dialling the carriers 10XXX code or by using the stations primary interlata carrier. If the call is routed over an IB trunk, FX line, or virtual facility group (VFG), digit manipulation facilities are provided so that the proper carrier is selected at the other end of the trunk connection. This is done by inserting the 10XXX digits in the outpulsed stream of digits. In the case of a DMS-100 CENTREX configuration with POTS access code (usually digit 9) the PIC is used to route directly to the carrier.

No modifications are required for Station Message Detail Recording (SMDR) so that the carrier may be identified.

2. FEATURE DESCRIPTION

2.1 Call Processing

2.1.1 POTS Access Code

Although it is anticipated that the single digit "9" will be the standard POTS access code, DMS/SL-100 will allow an access code of up to three digits. This limitation is because of the maximum 24 digits that can be translated and stored. The user may also specify "0" access digits to implement the "assume dial 9 capability".

Once an IBN call has entered the POTS environment the translation used is identical to the standard POTS equal access translation. All access codes including 10XXX, and 950 dialling are allowed.

The POTS access code is implemented by using the NET selector and the new GEN subselector in table IBNXLA.

2.1.2 LPIC/GPIC Options

FSD 20-24-0000 requires that a primary interlata carrier (PIC) may be specified on a per line (LPIC) or per group (GPIC) basis. Both of these PICs are optional and if present the LPIC overrides the GPIC.

DMS/SL-100 allows two levels of IBN translators; the preliminary translator and the customer group translator. If the dialled digits are not found in the preliminary translator then the customer group translator is searched.

DMS/SL-100 implementation of the LPIC feature is to provide a separate network class of service (NCOS) for the PIC'd line. The entry in the corresponding preliminary translator has a PIC associated with it. The GPIC option is datafilled in a similar manner except that the PIC is put in the customer group translator.

The PIC is optional in both the preliminary and customer group translators. The datafill also specifies if only the primary carrier may be used or if 10XXX dialling to other carriers is allowed (i.e. the CHOICE boolean). An interlata call entering the POTS environment without a carrier (either PIC'd or dialled) is sent to a termination specified in table OFCENG entry DEFAULT_CARRIER_OR_TREAT. A default carrier may be selected or the call may be routed to treatment.

2.1.3 PBX CO Trunks and FX/Tie Lines

Outgoing tie lines, FX lines, and CO trunks are treated much the same way in DMS/SL-100. In particular FX lines and CO trunks appear identical. All of these outgoing trunk types have the full digit manipulation facilities of IBN (table DIGMAN) available to them.

2.1.3.1 PBX CO Trunks

CO trunks have trunk type IBNTO in table TRKGRP and appear as lines in the adjoining end office. These trunks provide the traditional "dial 9 access" to the public network. Since the end office must have equal access capabilities for this feature to work the line appearance may be assigned the PIC option. This is probably the simplest but most restrictive method of achieving PIC dialling in an SL-100 office.

If IBN stations are allowed to dial a carrier directly then the 10XXX digits have to be outpulsed on the CO trunk. This is accomplished by using the new save prefix (SPF) option with the GEN subselector in table IBNXL. If this option is used then the 10XXX digits and the digits that follow will be available for outpulsing. Normally these digits are considered prefix digits and are not available to be out-pulsed.

The LPIC/GPIC option is made known over the CO trunk by outpulsing the 10XXX digits of the preferred carrier. The same routes and digit manipulation entries are used as for 10XXX dialling. This is done because the SPF option makes the 10XXX digits of the primary carrier available to be

outpulsed even though the digits were not dialled. Interlata calls will not have the 10XXX digits inserted since the carrier may not handle interlata traffic and the call would not complete. Note that this means that the inter/intralata status of all NPA/NNX's must be datafilled in table LATAXLA.

The general method of translating PIC calls is to perform complete translation and screening on the dialled digits (i.e. 1+7/10D). The PIC is then used to insert the appropriate 10XXX digits. At this point only pre-translation is performed on 10XXX+1+7/10D to determine the actual route to be used.

2.1.3.2 Tie Lines

The only capability required for outgoing tie lines is to be able to insert 10XXX in the string of digits to be outpulsed. The SPF option can also be used here but this means that both 10XXX and LPIC/GPIC calls will outpulse 10XXX digits on the tie trunk. The last office in the tie line chain will choose the carrier if it is not explicitly dialled. The existing limit of 30 digits in an outpulsed string still applies in the equal access environment.

Incoming tie trunks may be routed to the equal access environment. Since an incoming tie line has a network class of service (NCOS) associated with it, the preliminary translator for that NCOS can have the PIC option applied to it.

2.1.3.3 FX Lines

As mentioned before, FX lines appear similar to PBX CO trunks to the DMS/SL-100. The carrier is PIC'd at the appearance of the FX line in the far office.

If it is decided to outpulse 10XXX digits over the FX line then the SPF option may be used. It would be expected here that the corresponding entry in table IBNXLA would not have an LPIC/GPIC associated with it. This would mean that only calls that had the 10XXX digits explicitly dialled would appear as non PIC calls in the FX office.

2.1.4 Virtual Facility Groups

Virtual facility groups (VFGs) are a software simulation of a trunk group. In particular, POTS VFGs that simulate a trunk group from an IB PBX to an end office will be allowed to carry equal access traffic.

It should be noted that translation is done in two independent stages in a VFG call. One stage from the IBN station to the trunk side of the VFG and a second stage from the line (POTS) side of the VFG to the final destination. A PIC may optionally be assigned to the line (POTS) side of the VFG. Any call going through the VFG without a 10XXX prefix will use this PIC to choose a carrier.

As was the case for FX lines, the 10XXX digits must be "outpulsed" through the VFG if either 10XXX or LPIC/GPIC dialling is required. The SPF option in table IBNXLA may be used to accomplish this but if it is, then 10XXX and LPIC/GPIC calls will all appear as 10XXX calls on the POTS side of the VFG. Please refer to the section on table VIRTGRPS in NTP 297-1001-451N.

2.1.5 Outwats

IBN outwats calls usually make use of VFGs. The usual case would be to route to a VFG using the NET selector and the GEN subselector in table IBNXLA. The VFG would typically have a PIC associated with it. It should be noted that 0 minus calls on an outwats VFG are routed to the carrier operator instead of the BOC operator. The call will be routed to the route specified in table OCCINFO for that carrier's operator positions.

2.2.0 Billing

Calls involving an IBN station and an IC/INC will produce the standard equal access records. This applies to both originating and terminating records. This is a function of the DMS-100 billing software. In addition, special billing numbers (such as used with VFGs) will be put in the originating access record as well as outpulsed to the carrier.

DMS currently supports call codes 110, 114, 119, and 120 as well as the structure codes needed for these call codes. Since customer identification is not included in current DMS AMA records it will not be supported for IBN equal access records either. No new structure codes are required for this feature.

2.2.1 SMDR

No format changes are required for SMDR. The carrier identification digits can be found in the dialled digits. If a PIC call is made the 10XXX will be placed in the dialled digits after the POTS or outwats access code. This applies to the GPIC/LPIC options and PICs on VFGs.

2.3 Feature Interaction

The main point of interaction between IBN custom calling features and equal access is the ability to dial an equal access number (PIC or 10XXX) during the operation of an IBN feature. Most IBN features use the same translations as standard IBN calls and therefore they do not need any modifications for equal access.

The following are examples of IBN features that are in this category:

- 3 way calling
- speed calling (short and long list)
- network speed calling
- 6 party conference

- call forwarding
- call transfer
- off-hook queuing
- call back queuing
- direct inward system access (DISA)
- automatic route selection (ARS)

The following limitations apply to IBN custom calling features which require storing of all dialled digits:

- speed calling - long list 24 digits
- speed calling - short list 24 digits
- call forwarding 18 digits

3 REFERENCES

FDOC BC1368 Equal Access on IBN/Datapath
FSD 20-24-0000 Appendix F

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	OVERLAP CARRIER SELECTION
Feature no	F3920

FEATURE SYNOPSIS

Overlap carrier selection feature permits EAEO to outpulse carrier selection digits (if required) and ANI before the calling subscriber completes his dialling.

This feature reduces post dial delay on calls with OCS but increases processing time on most other calls by adding additional digits messages to CC.

FEATURE DESCRIPTION

Introduction

Because of the complicated and lengthy signalling used for Equal Access calls it is required that the EAEO have the ability to complete the majority of this signalling before the end of subscriber dialling.

The IC/INC has the option to choose Overlap Carrier Selection (OCS) on all calls, no calls, or on certain types of calls. This optionality is provided by data stored against each carrier (table OCCINFO) and also by translations. Table OCCINFO has as one of its fields, "OVERLAP". This field can either be set to "Y" or "N". If it is set to "N" this means that the carrier has chosen not to have OCS on any of its calls. If it is set to "Y" this means that the carrier wishes to have OCS based on type of call. The translation data for the EA selector then specifies whether a particular call is to use OCS or not.

FGC carriers (discussed in feature F3860) use pre-divestiture signalling and thus it is not possible to provide OCS for these carriers in the manner detailed in FSD 20-24-0000.

This feature is not associated with DP overlap outpulsing.

Domestic calls begin OCS when there are four digits remaining to be dialled. International calls begin after the Country Code has been dialled. A separate digit collection scheme has been created, which is optionally downloaded to the LM.

This optionality is achieved by providing a new office parameter called EA_OVERLAP_CARRIER_SELECTION. This parameter is a bool that has a default setting of "NO". All equal access end offices should set this value to "YES" unless that office does not serve any carrier wishing to use OCS. This parameter is to be used strictly in equal access end offices.

The outpulsing of the called no. does not occur until the dialling is complete and the ANI digits have been outpulsed on the trunk. The end of dialling is marked by a DIGITS_MSG and the end of ANI outpulsing is marked by a DIGITS_SENT_MSG.

REFERENCE

BC1367 Overlap Carrier Selection

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EA - EXPANDED TOLL DENIAL
Feature no	F5424

FEATURE SYNOPSIS

The purpose of this feature is to deny toll access from a given station to selected carriers. This capability is needed when the telco is doing billing for the carrier and is dealing with a subscriber that will not pay his bill.

When a subscriber makes a direct distance dialed (DDD) call to a carrier that he is denied access to, the call is blocked and sent to interlata restricted (LRS) treatment. Any operator assisted (OA) or inwats (800) call will be allowed to go through, but the identification digits outpulsed to the carrier indicate that this line is toll denied.

FEATURE DESCRIPTION

A line may be denied access to one, two, or three carriers by using the carrier toll denied (CTD) feature. The feature may be added or deleted using service orders or by making the appropriate change in table LENFEAT.

If a line is toll denied to a carrier the call may be blocked and sent to interlata restricted (ILRS) treatment or it may be allowed to go through. The actual decision to block a call to a carrier in the CTD list is based on several factors.

- 1) All CTD calls to a carrier marked feature group C (FGC) in table OCCINFO are sent to ILRS treatment.
- 2) If the entry for a carrier in table OCCINFO specifies no automatic number identification (AI) digits are to be outpulsed, a CTD call will always be sent to ILRS treatment.
- 3) If neither of the preceding conditions apply the call will be let through or sent to ILRS treatment as follows.

(10XXX) 1+7/10D - DD - ILRS treatment (direct dialed)

(10XXX) 0+7/10D - DA - call let through (operator assisted)

(10XXX) 011+CC+NN - DD

(10XXX) 01 +CC+NN - OA

10XXX+# - DD

10XXX+0 - OA

950-1XXX - DD

1+800_4D - DD (10XXX) 1+NPA+555+4D - DD

A call from a line with the CTD feature to a carrier not in the list of denied carriers will not be affected in any way. In particular, the information digits will not identify the line as toll denied. Any intralata call handled by the telco will not be affected by the CTD feature in any way.

It should also be noted that the inter/intra lata status of a call to a carrier will not affect the decision to block the call. Both inter and intra lata calls may be sent to ILRS treatment or allowed to complete using the special toll denied II digits.

If a call from a line with the CTD feature to a carrier in the CTD list is allowed to complete, the II digits will indicate the line is toll denied. These information digits take priority over all others unless the originating line can not be identified in the DMS-100. This occurs on ANI failures and on calls where an ANI test is not done (as on some multiparty lines).

Calltype - II digits used

Hotel - 68

Restricted sent paid (coinless pay phone) - 78

Standard - 08

CTD feature can be applied or deleted using the add option (ADO) and delete option (DEO) service order (SERVORD) commands.

The existing toll denied (TDN) option in table LENLINES will remain unchanged. that is, all DD and OA calls made using telco or carrier toll facilities will be blocked if the TDN option is present. The CTD option will be incompatible with both the TDN option and the toll diversion (TDV) option. Service orders will not allow these options to be put on the same line.

This option applies only to lines found in table LENLINES. It does not apply to integrated business network (IBN) lines or to incoming private branch exchange (PBX) trunks. In these cases, the corresponding pretranslator must be modified so that access to the required carriers is not possible.

There is a limit of three carriers that a line may be denied access to. After that the line must have its service suspended (SUS option) or have calls to all carriers blocked (primary interlate carrier (PIC) set to NILC and CHOICE = N on PIC option).

References

NTP 297-1001=181 Equal Access General Description
BC1379 FDOC

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EA - CC REAL TIME IMPROVEMENT
Feature no	F5425

FEATURE SYNOPSIS

The purpose of this feature is to reduce the real time used for equal access calls. This is accomplished by changing central control software dealing with: i) digit collection, and ii) AMA billing.

FEATURE DESCRIPTION

i) Overlap carrier selection (OCS) feature (F3920) added recently had a real time impact on both OCS and non-OCS calls. Present feature (F5425) offsets this real time impact on non-OCS calls by allowing OCS to co-exist with line to DP trunk overlap outpulsing. A new office parameter has been created (EA_OCS_AND_DP_OVLP_NEEDED).

ii) The changes to the billing software are two-fold:

- a) Formatting of equal access AMA records has been streamlined and made more efficient.
- b) Formatting is done out of the CCB rather than forcing into a recording unit.

References

FDOC BC1380

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - 00 MINUS DIALING ROUTED VIA PIC
Feature no	F5489

FEATURE SYNOPSIS

This feature allows the subscribers to reach their presubscribed carrier's operator by dialling 00-. (Without this feature the subs have to dial 10XXX+0- to reach presubscribed carrier's operator.)

FEATURE DESCRIPTION

This feature allows a customer who has a PIC to have access to that carrier's operator services by dialling 00-.

For IBN customers, 00- is treated the same way as for ordinary CO subscribers except that if the IBN station does not have a PIC, a group PIC is used if one exists.

If no PIC exists, the call is routed to the default carrier, if one exists, or to announcement (see FS1) 20-24-0000, Section 3.3.2.1).

Calls dialed 10XXX+00- are routed to the operator services of the carrier specified by XXX digits.

Calls dialled 0- or 0# are routed to the local telco's operator as before. This feature supports both FGC and FGD signalling. All 00-, 10XXX+0- and 10XXX+00- calls pick up a route in translations so that class of service screening can be performed on the originating party. Upon completion of the call, a call code 110 equal access billing record is generated.

Customers who have the carrier toll denied (CTD) option on their line can still make calls to their PIC's operator by dialling 00-. (Carrier toll denied is covered under feature F5424.)

References:

FSD 20-24-0000 Dec 1984 Equal Access Feature FDOC
BC1379

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EAEO - P2(PX) TRUNK COMPATIBILITY
Feature no	F5490

FEATURE SYNOPSIS

The purpose of this feature is to provide equal access capabilities for private branch exchange (PBX) trunks and foreign exchange (FX) trunks in an equal access end office. These capabilities include 10XXX dialing and PIC dialing as well as standard equal access billing records in both the originating and terminating directions.

FEATURE DESCRIPTION

General

This feature affects incoming and outgoing calls from trunks with GRPTYP P2 and PX in table TRKGRP. Four new fields must be datafilled for these types of trunks if any equal access calls are to be made.

1. EA - Set Y if EA capabilities required.
2. PIC - Primary interlata carrier of trunk group.
3. CHOICE - Set Y if 10XXX dialing is allowed.
4. LATANM - Originating LATA of P2/PX group.

In offices without equal access the user should type "N" in the EA field of a PX/P2 trunk the PIC, CHOICE, and LATANM fields will not appear.

In addition to the table TRKGRP data there is a new option in table CXGRP. This is the carrier toll denied option (CTD). Feature F5424 (equal access expanded toll denial) describes how this feature works for POTS lines and the same specifications apply to PX trunks. Access can be denied to a maximum of three carriers using the CTD option in table CXGRP.

Since the CXGRP table can only be used by PX trunk groups the CTD option will only be available to PX trunks. Please refer to the restrictions/limitations section of this document.

Translation

Translation for an equal access call from a P2/PX trunk is very similar to that for a POTS line. The standard pretranslator to be used is taken from table TRKGRP along with the PIC, CHOICE, and LATA name to be used. Equal access translation from this point on should be identical to POTS equal access. Refer to NTP 297-1001-181 (DMS-100 Equal Access General Description) for details on POTS EA translation.

All EA call types are supported for P2/PX trunks.

Digit Collection

In table TRKSGRP two digit collection timeouts PSPDSEIZ and PARTDIAL are specified. PSPDSEIZ is the timeout used to collect the first digit and PARTDIAL is used to collect the remaining digits. A timeout of 4 seconds is used when an ambiguous digits situation occurs. This happens after the first digit on 0 minus calls and after the sixth digit on 10XXX-0 minus calls. It could also occur if a code is marked as ambiguous in table HNPACONT (i.e. where 1-213-XXXX and 1-213-NNX-XXXX are both valid numbers a timeout of 4 seconds is used after the eighth digit).

Billing

The standard equal access billing records are supported for EA calls originating from or terminating to a P2/PX trunk group. The following call codes are currently supported by the DMS-100 equal access end office package. Refer to appendix B of FSD 20-24-0000 for more details.

- 110 - interlata station paid
- 114 - interlata watts billing number
- 119 - terminating access record
- 120 - originating lata overflow counts.

Restrictions/Limitations

Since only PX trunk groups have direct access to the CXGRP table the CTD option cannot be applied to P2 trunks. P2 trunks should have their associated pretranslators modified so that access to the denied carriers is blocked. Overlap carrier selection is not supported for P2/PX trunks.

At present an MF PX trunk can dial a maximum of 15 MF digits including the KP and ST digits. This means that 10XXX dialing is not allowed for this signalling type. A PIC must be used in this case.

Currently, international feature group C (FGC) calls are not supported from P2/PX trunks. This feature will not implement FGC international in either equal access or non equal access offices. Feature group D (FGD) international calls is supported as part of the P2/PX equal access.

References:

FSD 20-24-0000 Equal Access Feature Spec
BC1791 FDOC
NTP 297-1001-181 Equal Access Description

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE (EAE0)
Feature	CORRIDOR 611 ROUTING AND BILLING
Feature no	F5566

FEATURE SYNOPSIS

This feature adds three capabilities to an equal access end office (EAE0):

1. Completion of interLATA corridor calls by the operating telephone company (OTC).
2. Completion of interLATA privilege calls by the DTC.
3. Prevent completion of intraLATA calls within the same equal access exchange area (EAEA) by ICs.

FEATURE DESCRIPTION

1. Corridor Calls:

In some cases an OTC is allowed to handle certain high volume calls between two adjacent LATAs. These are called corridor calls. They are treated as non equal access intraLATA calls and are billed accordingly.

This is accomplished by making the OTC a special kind of equal access carrier. Corridor calls can then be made by dialing the 10XXX digits of the OTC or having the OTC as a PIC (primary interLATA carrier). Such calls are screened and sent to invalid corridor call (IVCC) treatment if the call is interLATA but not in the corridor as determined by LATA translations.

Only interLATA calls can be marked as corridor. The following corridor call types are supported:

```
(10XXX) 0+7/10D
(10XXX) 1+7/10D
10XXX 0
(10XXX) 00
```

2. Privilege Calls:

These are similar to corridor calls. They cross a LATA boundary and are completed by the OTC. They are treated as non equal access intraLATA calls. No 10XXX or PIC is required to make a privilege call. Calls marked as privilege but dialed with 10XXX prefix are treated as normal equal access interLATA calls.

Only interLATA calls can be marked as privilege. The following privilege call types are supported:

0 + 7/10D complete using OTC
1 + 7/10D complete using OTC
10XXX 0 + 7/10D complete using IC (XXX)
10XXX 1 + 7/10D complete using IC (XXX)

If corridor and privilege options are present in the same office then a privilege call can be made by dialing the 10XXX digits of the OTC.

3. Equal Access Exchange Area (EAEA) Calls:

this feature prevents the ICs from completing intraLATA calls that are within the OTCs EAEA in cases where ICs are allowed to compete with OTCs on long distance intraLATA calls (i.e. calls between different EAEAs).

If the call is marked as non-EA in LATAXLA table and prefixed with 10XXX of an IC, then the call is blocked and sent to NACD (no dial access) treatment. The OTC must datafill all entries in table LATAXLA (LATA translation) that it wants treated as EAEA calls. Only intraLATA calls can be marked as EAEA. The following EAEA call types are supported:

7/10D complete using OTC
0 + 7/10D complete using OTC
1 + 7/10D complete using OTC
10XXX 7/10D NACD treatment
0 + 7/10D NACD treatment
1 + 7/10D NACD treatment

Corridor, privilege and EAEA calls are billed as intraLATA calls using LAMA or CAMA.

Access to carrier (ATC) trunks should not be used for corridor/ privilege calls.

Ref:

BC1390 FDOC
FSD 20-24-0000 LSSGR

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE (EAEO)
Feature	EAEO - IC/INC EVENT STATUS ENHANCEMENT
Feature no	F5572

FEATURE SYNOPSIS

Earlier equal access features supported call events 01, 03, 05, 06, 08, 09, 10 and 11. This feature adds the missing call events 02, 04, 07, 12 and 13.

FEATURE DESCRIPTION

With the addition of this feature, all of the call events specified in FSD 20-24-0000 Appendix B table 58 (Dec '85 revision) are now supported by DMS-100F (call events marked by an asterisk have been added by this feature):

- 01 - billing wink
- ³02 - abandon or timeout before dialing is complete (orig. LATA)
- 03 - second start dia wink from INC (orig. LATA)
- ³04 - timeout waiting for acknowledgement wink (orig. LATA)
- 05 - OLS or CAMA signalling off hook ANI request signal from IC/INC arter receipt of called number (orig. LATA)
- 06 - call terminated due to network management feature (term. LATA)
- ³07 - acknowledgement wink received (orig. LATA)
- 08 - invalid called number (term. LATA)
- 09 - all failures (except invalid called number) (term. LATA)
- 10 - answer (orig. or term. LATA)
- 11 - timeout waiting for second start dial wink from INC (orig LATA)
- ³12 - OS or CAMA signalling - timeout waiting for off hook (orig ")
- ³13 - off hook rather than second start dial wink from INC (orig ")

Ref: FSD 20-24-0000 LSSGR

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EA: OPTIONAL/SAC CODES
Feature no	F5677

FEATURE SYNOPSIS

At present NO/IX codes which are to be treated as service access codes (SAC) are hardcoded into the system. This feature adds a table which contains SACs datafilled by the operating telephone company (OTC).

FEATURE DESCRIPTION

A SAC is a code in the form NO/IX that takes place of a numbering plan area (NPA) in the dialing sequence in order to access a particular service provided by IC/INC, BOC or independent company.

This feature adds a new table called EASAC datafilled by OTC, which allows the OTC to add or delete codees which are to be treated as SACs.

Permissible SACs are in the form NO/IX, except NII, where N = 2-9 and X = 0-9. The only call type applicable to SACs is 1+NO/IX+NXX+XXXX. If a subscriber attempts to dial a SAC using 10XXX, the call will be given a carrier access code error (CACE) treatment.

Ref: BC1723 FDOC
FSD 20-24-0000 LSSGR

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	CIRCLE DIGIT EQUAL ACCESS COMPATIBILITY
Feature no	F5683

FEATURE SYNOPSIS

This feature allows subscribers with circle digit to make 10XXX calls.

FEATURE DESCRIPTION

At present circle digit feature supports the following format of calls: I/O + CD + 7/10, where CD (circle digit) is 0-9. CD is the second digit dialed and therefore 10XXX calls could not be supported because second digit is always '0'.

When EA_WITH_CD = N, the office works the old way, i.e.,

- 1) Option CDO (circle digit zero) can be added to 8 and 10 party lines.
- 2) Lines with a CD cannot make 10XXX calls.
- 3) Lines with a CD can have PICs (presubscribed interLATA carriers).
- 4) The office parameter SPDD_DIGIT (single party direct dial digit) can be set to a value from 0 to 10.

When EA_WITH_CD = Y:

- 1) CDO cannot be used as an option on 8 and 10 party lines. This limits 10 party lines to 9 subscribers.
- 2) Lines with a CD can make 10XXX calls. When the second digit is 0, the CD becomes the seventh digit dialed.
- 3) Lines with a CD can have PICs.
- 4) SPDD_DIGIT cannot be set to 10. (A value of 10 means that 1FR, 2FR, 4FR and i2pl have a circle digit of 0, i.e., they do not have to dial a CD.)

The following types of equal access calls are allowed with CD:

```
I/O + CD + 7/10D
10XXX + I/O + CD + 7/10D
10XXX + 0 + CD
10XXX + 0 + CD + #
```

Note that international calls are not supported. Also, the following operator call types are blocked: 10XXX + 00 and 00.

Ref:

BC1709 FDOC

FSD 20-24-0000 LSSGR

Package	NTX186AA06 EQUAL ACCESS END OFFICE
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	OMS - PIC AND NON PIC CALLS PER IC/INC
Feature no	F6244

FEATURE SYNOPSIS

This feature expands the scope of operational measurements (OM) in the equal access carrier (EA CARR) OM group to include a differentiation of calls which use their primary interlata carrier (PIC) from those that do not.

FEATURE DESCRIPTION

Prior to this feature the OM group EACARR consisted of five registers that were pegged for originating EA calls on a per carrier basis. FGC carriers were not included.

This feature modifies EACARR group to include four new registers for PIC and non-PIC dialed calls (domestic and international). It also includes pegging of LEAS calls and FGC carriers.

The following list shows the existing and the new registers in OM group EACARR:

The five existing registers are:

- EADOMES - domestic calls
- EAINTL - international calls
- EAINTRM - interim calls
- EAWNKFL - wink failure calls
- EAACKFL - acknowledgement failure calls.

The four new registers are:

- EADOMPIC - domestic PIC calls
- EADOMXXX - domestic non-PIC calls
- EAINTPIC - international PIC calls
- EAINTEXX - international non-PIC calls

Ref: DDOC BC1395

NTX187AA03 Status: RTM TOPS - EQUAL ACCESS

TOPS	:	
TOPS - OPERATOR FLEXIBLE ROUTING		F2619
TOPS - ANI FORWARDING ON 0-CALLS		F2620
TOPS - ANI SIGNALLING COMPATIBILITY		F2621
ACCESS TANDEM	:	
TRUNK SIGNALLING PROTOCOL/FORMAT CONVERSION		F2635
TOPS AMA	:	
CARRIER CODE ON AMA FOR TERMINATING TOPS CALLS		G0029
TOPS FGB CALL CODE 134		G0053

Package	NTX187AA03 TOPS - EQUAL ACCESS
Feature set	TOPS
Feature	TOPS - OPERATOR FLEXIBLE ROUTING
Feature no	F2619

FEATURE SYNOPSIS

Calls arriving at an Access Tandem) in an Equal Access environment on TOPS trunks are routed either to BOC operator or to an interexchange carrier whose traffic is to be split over several routes.

FEATURE DESCRIPTION

This feature will have the capability to route the call to a BOC TOPS-operator if it is an INTRALATA call and to route calls to the ICs if they are destined to other LATAS.

The routing method meets the requirements of the LSSGR. Currently three types of lines can connect directly to TOPS positions: coin lines, hotel lines and 1FR lines. However, if these lines connect directly to TOPS, local EA software will not be invoked. In particular, the LATA status of a call will not be defined and therefore the call will not be processed as either intra or inter LATA. Therefore, if a call from a line is to be routed properly in a BCS-16 TOPS EA office, it must arrive at TOPS on a loop around trunk group.

The TOPS set up processor is modified to do the routing of carrier calls by determining whether the call is a carrier call or not. This is done by analysing ANI information or by using translation data.

Package	NTX187AA03 TOPS - EQUAL ACCESS
Feature set	TOPS
Feature	TOPS - ANI FORWARDING ON 0-CALLS
Feature no	F2620

FEATURE SYNOPSIS

To provide means to forward a 0-call from a TOPS operator to an inter-exchange carrier operator with ANI information.

FEATURE DESCRIPTION

This feature allows the BOC operator on an access tandem switch to direct 0-calls to an IC operator with ANI data.

The following enhancements are made to ease the operator's role:

- a) a procedure through which the operator can forward the call to the appropriate inter LATA carrier operator service.
- b) a procedure through which the operator can enter the inter LATA carrier access code to be used by the call.
- c) a display on the TOPS screen indicating whether or not the calling party is restricted from making inter LATA calls.
- d) a display on the TOPS screen indicating whether or not the call is inter LATA.
- e) a display on the TOPS screen indicating whether or not the call is to be transferred to an inter LATA carrier operator.
- f) a display on the TOPS screen indicating the inter LATA carrier access code to be used by the call.

Package	NTX187AA03 TOPS - EQUAL ACCESS
Feature set	TOPS
Feature	TOPS - ANI SIGNALLING COMPATIBILITY
Feature no	F2621

FEATURE SYNOPSIS

This feature provides capability for new types of signalling to be sent over TOPS trunks to the Access Tandem Switch. This signalling is needed for support new equal access environment. Three signalling types will be supported:

- a) Traditional Signalling (as per AT&T Blue Book)
- b) Operator Services Signalling (subject feature)
- c) Equal Access Signalling (as per LSSGR)

FEATURE DESCRIPTION

Traditionally, the information on the calling number, the calling origination type (0+, 1+ etc), the calling service feature (coin, non-coin, hotel etc), and the ANI status (ANI success, AMF etc), are obtained by looking at the travelling class marks (ST and ID) of the calling and called number digit streams. This is sufficient in a non Access Tandem environment. With access tandem, the ST has taken a new meaning and the ID has been extended to two digits.

To take care of these changes, two new tables have been created:

- a) Table TOPEATRK to provide information on carrier type, type of originating end office and some class of service screening data.
- b) Table OSSCAT similar to BELLCAT which matches the two digit ID to the calling origination type and/or calling service feature and/or ANI status.

Package	NTX187AA03 TOPS - EQUAL ACCESS
Feature set	ACCESS TANDEM
Feature	TRUNK SIGNALLING PROTOCOL/FORMAT CONVERSION
Feature no	F2635

FEATURE SYNOPSIS

The application of Equal Access signalling at the Access Tandem has already been provided for calls over Intertoll or Supercama trunks (Feature F3438). This feature expands that capability to include incoming TOPS trunks and includes ANI regeneration and ANI modification.

FEATURE DESCRIPTION

Introduction

From a TOPS point of view the Equal Access Plan (EAP) is severely limited because it supports only station calls from conforming end offices. Most calls arriving at the Access Tandem over TOPS incoming trunks are constrained to use Operator Services (OS) signalling either because the subtending end office is non-conforming, or because operator assistance is required.

Note that any TOPS incoming trunk can carry both EA traffic and OS traffic because the signalling plan used is determined on per call basis according to the first stage of digits received:

EA: KP+0ZZ+XXX+ST
OS: KP+7/10 digits+ST

InterLATA Calls

The LATA destination of the call arriving on a TOPS trunk must be determined by the access tandem. The interLATA status of a call may be established by several methods:

- 1) Equal access signalling is used. These calls are interLATA by definition and must be routed to carrier trunks dedicated to the EAP.
- 2) Modified Bell signalling can now carry an interLATA mark on the start digit of ANI spill received from an equal access end office (ST implies Interlata and STP Intralata).
- 3) Translations can always determine that a call is interLATA provided, of course, that the called digits are available.
- 4) Finally, any operator-assisted call may be forwarded to a carrier by the BOC's colocated TOPS operators (as 0- call).

If the call is "not" interLATA it is served by the Bell Operating Company (BOC) and the access tandem behaves as a normal class 4 office. Otherwise it is forwarded to the carrier and the access tandem behaves as a class 4X office.

ANI Regeneration

Whenever ANI spill has been received on the incoming TOPS trunks, it must be regenerated to the carrier, optionally with alterations to reflect pertinent information keyed by the TOPS operator. On the other hand, if the ANI spill has not yet been received, then it may simply "pass through" the access tandem on its way from the end office direct to the carrier (as is always the case for EA signalling).

Note that ANI regeneration causes a significant increase in post-dial delay. Unfortunately, this is almost always unavoidable because ANI pass-through cannot occur under the following circumstances:

- 1) Selective class-of-service routing to the carrier is required. The ANI spill identifies call attributes such as coin vs hotel, direct-dialed vs operator-assisted, etc. for routing purposes (see Feature F2619).
- 2) The incoming TOPS trunk is connected to an outgoing carrier trunk which uses a different signalling plan. For example, ANI cannot pass from an operator services signalling trunk to an equal access signalling trunk.
- 3) An incoming TOPS DP trunk is connected to an outgoing carrier MF trunk. The coded start digit is associated with the ANI spill for DP trunks but with the called digits for MF trunks.
- 4) The incoming TOPS trunk is connected to an outgoing carrier trunk which sends incompatible ANI information digits. This is the case when the number of information digits (1 or 2), or their interpretation, changes across the switch.
- 5) A TOPS operator is required. Before an operator is attached at the access tandem the ANI spill must be received for display to the operator and to prevent a timeout at the end office.

Because of these difficulties, ANI will always be received at the access tandem and regenerated towards the carrier, except when the equal access plan applies.

ANI Modification

Any call presented to a TOPS operator at the access tandem, and which is determined to be interLATA, can either be turned back by the operator or

forwarded to the carrier as a 0- call. (Future development could allow the call to be forwarded as a "plus" call.)

But the process of determining that the call is interLATA requires the presence of the calling number as well as the called number. If the call is ONI or ANI fail, the calling number is requested by the operator and keyed into the system. This provides the opportunity to forward the call to the carrier as ANI success.

In addition, the operator also has the ability to identify the call as coin or hotel. This new information can also be incorporated into the ANI digits which are forwarded.

This capability goes a long way in eliminating the annoyance to the subscriber of having to repeat the information to the carrier operator.

Coin Control

Once a coin call has been established through the access tandem to the carrier, there remains the requirement of propagating coin signals back from the carrier to the end office.

The various methods of coin control impose timing constraints which are critical to receiver control at the end office and the duration of speech cutoff. Because of these constraints it is absolutely out of the question for the access tandem to receive and regenerate the coin control signals to the end office. Instead, the coin signals must pass directly through the access tandem from the carrier to the end office without deterioration.

To achieve this objective, the incoming TOPS trunk and the outgoing carrier trunk are guaranteed to use an identical coin signalling method by selective class-of-service routing techniques. Inband tones simply pass through the voice connection without interference. Winks are propagated through the office within the standard DMS cross-office delay of 22 ms.

References

FSD No. 20-24-0000
Feature F3438 EA AT Trunking
Feature F2619 Operator Flexible Routing
Feature F2620 ANI Forwarding on 0- Calls
Feature F2621 ANI Signalling Compatibility

Package	NTX187AA03 TOPS - EQUAL ACCESS
Feature set	TOPS AMA
Feature	CARRIER CODE ON AMA FOR TERMINATING TOPS CALLS
Feature no	G0029

FEATURE SYNOPSIS

This feature allows the Carrier Access Code (CAC) associated with an Interexchange Carrier (IC) to be produced on the AMA record for all inward service type calls (verification, request, DA etc) sent to TOPS from an IC. This will allow Telcos to charge a fee to the carrier for services rendered.

FEATURE DESCRIPTION

This enables the TOPS operator to input the CAC associated with an IC for inward service type calls arriving over IT trunks. CAC is obtained from distant operator over the voice trunk and keyed in. The KP IC<CAC>START sequence is used in TOPS IV and IC<CAC>START in TOPS MP. The CAC keyed in is then produced on the AMA record.

It also enables inward service type calls to arrive at TOPS over ATC (Access Tandem to Carrier) trunks.

Creations of non-carrier CAC involve datafilling tables OCCNAME, OCCINFO, TOPEACAR, and PICNAME appropriately. This enables telco terminating the inward call to charge the originating telco.

The table TOPS should show NOAMA field "N" for inward service type calls.

The TOPS MP has various screen implementations on the position type and call next.

Ref: AF0968

Package	NTX187AA03 TOPS - EQUAL ACCESS
Feature set	TOPS AMA
Feature	TOPS FGB CALL CODE 134
Feature no	G0053

FEATURE SYNOPSIS

This feature allows Operating Companies to record non-operator-handled Traffic Operator Position System (TOPS) Feature Group B (FGB) calls on BellCore (BC) Automatic Message Accounting (AMA) with call code 134, structure code 625.

It also allows TOPS calls routed from the Pre-Translator using a T or S Selector to be processed by TOPS Equal Access (EA) without changing the index into table OFRT provided by the Pre-Translator.

FEATURE DESCRIPTION

Feature Group B Call Code 134

This feature allows non-operator-handled TOPS FGB calls that normally produce AMA records with call code 251, structure code 734 to produce AMA records with call code 134, structure code 625.

An office parameter, TOPS_FCB_CC134, is added to the Office Variable (OFCVAR) table. This parameter determines whether non-operator-handled TOPS FGB calls that would have produced AMA records with call code 251, structure code 734 will produce AMA records with call code 134, structure code 625.

Operator-handled TOPS FGB calls are not affected by this office parameter.

Equal Access Processing With T or S Selector Routing

This feature allows TOPS calls routed from the Pre-Translator using a T or S Selector to receive TOPS EA processing without TOPS EA changing the index into table OFRT provided by the Pre-Translator.

An office parameter, TOPS_EA_PROCESS_T_SEL, is added to table OFCVAR. This parameter determines if TOPS calls routed using a T or S Selector are to receive TOPS EA processing without TOPS EA changing the index into table OFRT provided by the Pre-Translator. This additional processing determines if the call is a carrier call. If it is a carrier call, the carrier number is obtained, EA class of service is set which allows the TOPS calls to be routed, and the carrier number is used for AMA.

For non-operator-handled TOPS FGB calls, it also allows (in conjunction with parameter TOPS_FGB_CC134) for the production of AMA records with call code 134, structure code 625.

Ref: FDOC AF1100

NTX188AA02 Status: RTM TOPS - BCR AMA FORMAT

TOPS EQUAL ACCESS	:	
BELL(U.S.) AMA FORMAT COMPATIBILITY		F2634
AMA CALL CODES	:	
TOPS CALL CODE 009 FOR DA		F2920
CALL PROCESSING	:	
AMA FOR TOPSMP DA CALLS		F6964

Package	NTX188AA02 TOPS - BCR AMA FORMAT
Feature set	TOPS EQUAL ACCESS
Feature	BELL(U.S.) AMA FORMAT COMPATIBILITY
Feature no	F2634

FEATURE SYNOPSIS

AMA recording in the new operator services AMA format as specified in OSSGR is provided.

FEATURE DESCRIPTION

This feature will partially fulfill the requirements for an EA-AT TOPS office. ie - This implements the new EA-AMA format for TOPS.

There are two basic functions which are accomplished:

a) Call Processing Modifications

Specifications in the BELLCOR document requires the TOPS charge adjust key and the KP Trouble key to be changed to specify operator suspected fraud, walkaway, part change (used to specify a change of billing, coin credit etc).

b) New AMA Formatter for TOPS EA

- in this case:

- i) the formatter decides what the call code is for a call and then which structure code is necessary and formats the AMA record accordingly. The call code is calculated from both the type of call and the keying action of the operator. The structure code is selected from the call code calculated above and the details of the call.
- ii) the existing AMADUMP CI software will be modified to support the new TOPS structure codes. This development will be invisible to the user.

Package	NTX188AA02 TOPS - BCR AMA FORMAT
Feature set	AMA CALL CODES
Feature	TOPS CALL CODE 009 FOR DA
Feature no	F2920

Synopsis

The TOPS Call Code 009 for Directory Assistance (DA) feature allows operating companies to produce Bellcore Automatic Message Accounting records with call code 009, structure code 724 for Centralized Automatic Message Accounting (CAMA) 1+DD, ONI, and ANIF 411 DA calls that do not index Table TOPS during translation and are forwarded to a DA center.

This feature also allows operating companies to have the Terminating NPA field of the AMA record contain 00XXXX (where XXX is the NPA of the calling number) and the Terminating Number field contains 4110000C.

The AMA record produced for a 411 DA call tandemed through a TOPS office now corresponds to the specification set forth in the OSSGR for 411 DA calls.

Implementation

This feature adds two new office parameter, TOPS_TANDEMED_411_CC009, and TOPS_411_RECORD_NPA_IN_AMA, to Table OFCVAR. This feature is implemented by setting these two parameters to 'Y'.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX801AA Toll Features I
NTX030CA TOPS Call Processing Features
NTX030CB TOPS Call Processing Features or
NTX030CC TOPS Call Processing Features
NTX098AA AT&T CAMA Format or
NTX159AA AT&T CAMA Format

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing features.

Restrictions

This feature does not affect 411 DA calls when TOPS provides the DA service.

If TOPS_411_RECORD_NPA_IN_AMA is set to Y and no calling NPA is present, only the Terminating Number field in the AMA record is changed.

This feature does not affect 411 DA calls marked Tollfree in Table SERVSCRN.

Reference

FDOC AL0420

Package	NTX188AA02 TOPS - BCR AMA FORMAT
Feature set	CALL PROCESSING
Feature	AMA FOR TOPSMP DA CALLS
Feature no	F6964

Synopsis

This feature provides optional directory assistance and intercept service on TOPS Bellcore AMA records. It also provides a method of applying a surcharge for the completion of directory assistance calls from a TOPS MP position and of so indicating in Bellcore AMA records. This type of AMA is needed to support TOPS DA service as implemented on TOPS MP positions.

Implementation

Table DABILL has two new fields. ENHAMA is set to 'Y' to append the DA module on the AMA record for billing DA and intercept calls. CCSURCHG is set to 'Y' to apply a surcharge for completion of a DA or intercept call.

New table DACCSUR contains the amount of surcharge to apply to a completed DA or intercept call. The charge can be applied based on the originating class of service.

New table DACCSURI is a duplicate of DACCSUR, used by MASSTC.

The MASSTC CI command now includes table DACCSUR.

The RATE CI command now includes application of a surcharge for DA or intercept call completion.

With this feature, in the AMA record, field ANSWER = 'UNANSWERED' and field ELAPSED TIME = 0.

When the operator cancels a DA call by keying CA CALL followed by POS RLS, non-revenue call code 035 indicates that no DA service was provided.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTX801AA TOLL Features I
 either NTX030CA TOPS Call Processing Features (upgraded by NTX030CB)
 or NTX801CB TOPS Call Processing Features (upgraded by NTX030CC)
 or NTX030CC TOPS Call Processing Features
 either NTX098AA AT&T CAMA Format
 or NTX159AA AT&T LAMA Format

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AF1152

Package	NTX190AA01 FEAT GRP B AMA - TANDEM (NT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ACCESS CHARGE RECORDING - TANDEM(NT FORMAT)
Feature no	F2610

FEATURE SYNOPSIS

Feature Group B Operation

Feature Group B is a plan which enables Other Common Carriers (OCC's) to access the BOC (Bell Operating Company) network to provide long distance service to telephone subscribers. The subscriber will access the selected OCC by dialing 950-10XX, where XX is a code identifying the carrier. After having dialed 950-10XX the OCC will provide second dial tone to the patron who will then dial a PIN code (optionally) and the called number. The OCC will bill the patron for long distance call and the BOC's will bill the OCC for the use of their network for both the origination and termination of the call.

Feature Group B is differentiated from Feature Group A (previously ENFIA A) in that 950-10XX is dialed rather than any seven digit number and connections to the OCC's are via trunks rather than lines.

Two-way CAMA trnks are used to connect OCC and BOC offices (both tandem and end offices). In a tandem office the incoming OCC traffic must be received on a supercama trunk (with ANI). Hence all outgoing OCC traffic in a tandem office are supercama to two-way CAMA trunk calls. Terminating OCC traffic in both tandem and end offices arrive from the OCC's via two-way CAMA trunks but are routed thereafter as any normal call.

AMA Records

The recording of outgoing and incoming calls is done at the BOC office which connects to the OCC switch.

FEATURE DESCRIPTION

In a tandem office FGB Access Charge recording is done using the same AMA records as in end office (Feature F2564), i.e.:

BO - originating Access Charge Record
 B1 - Terminating Access Charge Record

The following example shows the basic information provided in the BO record. The EE record generated along with the BO record provides circuit ID's from which the trunk group used can be identified.

Record Code:	B0
Entry Code:	00

Information Digits: 00
Service Feature Code: 00
Calling Number: 6136211234
Called Number: AAAAAAAAA9501012
Carrier Event Information:8
Day:135
Time (hr min sec):02 30 23
Elapsed Time:000030
Feature Group Indicator:1
IC/INC Prefix:0121
Carrier Connect Day:135
Carrier Connect Time (hr min sec):02 30 15
Elapsed Time From Carrier Connect:000038
Dialing Indicator:3

(The following derived from the Carrier Event Information }

Answer:Y
Routing Indicator:N
ANI Indicator: Y

Record Code: EE
Spare: 00
Incoming C11 ID: 0005
Outgoing C11 ID: 0006
Incoming Member ID: 03
Outgoing Member ID: 01

The following shows the basic information provided in the B1 record.

Record Code: B1
Entry Code: 00
Information Digits: 00
Service Feature Code: 00
Called Number: 6136214321
Carrier Event Information: 0
Day: 135
Time (hr min sec): 02 30 23
Elapsed Time: 000030
Feature Group Indicator: 1
IC/INC Prefix: 0000
Carrier Connect Day: 135
Carrier Connect Time (hr min sec): 02 30 15
Elapsed Time from Carrier Connect: 000038

(The following derived from the Carrier Event Information }

Answer: Y
Routing Indicator: N

Record Code: EE
 Spare: 00
 Incoming C11i ID: 0005
 Outgoing C11i ID: 0006
 Incoming Member ID: 03
 Outgoing Member ID: 01

See feature F3768 for a method of setting up translations to ensure proper terminating NPA for these records when NPA is not part of the dialed digits.

Carrier Event Information Field replaces the regular Event Information Digit in the call record. The following table shows the values and meaning for this field.

Meaning -----	Value															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Answered	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
Calling Party Disc	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Called Party Disc	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Routing (tandem)	N	N	N	N	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y
ANI	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y

References:

- NTP 297-1001-119N Automatic Message Accounting
- F2494 Access Charge Recording - End Office (ATT Format)
- F2496 Access Charge Recording - Tandem (ATT Format)
- F2564 Access Charge Recording - End Office (NT Format)
- F3768 Terminating NPA in AMA Records
- R0610 Access Charge Recording - Tandem (NT Format)

NTX192AA01 Status: RTM 4X OPERATION - BELL FORMAT ANI

TOLL SERVICES	:	
REGENERATIVE ANI BELL FORMAT		F2139
SWITCHING AND TRANSLATION	:	
COIN CONTROL CAPABILITY ON SC TRK GROUPS		F2395

Package	NTX192AA01 4X OPERATION - BELL FORMAT ANI
Feature set	TOLL SERVICES
Feature	REGENERATIVE ANI BELL FORMAT
Feature no	F2139

DESCRIPTION

This feature requires DMS to regenerate ANI (Bell Format) which it receives on AMA trunks. This regeneration can be on any type of call (operator assisted 'OA' or direct dialed 'DD').

In most cases, DMS will receive mixed traffic (coin, etc.) on CAMA trunks. All 1+ (non-coin) traffic will be billed and routed by the DMS. The operator assisted traffic will be routed to either TSPS or TOPS office.

All coin traffic should be handled by local-tandem trunks (ZI), where the coin control signals are supported.

On calls going out on TSPS or TOPS trunks, regeneration of ANI is required. On DP trunks, when ANI is not received, the call type (DD or OA) information is not present. In such case, it should be possible to control that call (to: a treat, CAMA-POSN or TSPS-POSN).

The call type information is present on the called number 'ST' digit for MF trunks and on the ANI on the DP trunks.

Package	NTX192AA01 4X OPERATION - BELL FORMAT ANI
Feature set	SWITCHING AND TRANSLATION
Feature	COIN CONTROL CAPABILITY ON SC TRK GROUPS
Feature no	F2395

BACKGROUND -

Feature R0139 provided capability to regenerate ANI (Bell-Format) which it receives on CAMA trunks. This function is required when DMS receives mixed traffic (Coin, etc) on CAMA trunks. All 1+ (noncoin) traffic will be billed and routed by the DMS. The Operator-Assisted (OA) traffic will be routed to either TSPS or TOPS office.

The call-type information is present on the called number 'ST' digit for MF trunks and on the ANI for the DP trunks. The DMS is capable to decide depending upon the trunk-group data and the call-type information whether to route the call to a TSPS/TOPS route or not.

Two new fields are used in the 'SC' trunk-group for the BELL signalling-format to indicate the type of traffic and the default route. These two fields are:-

- 1) GRPTYPE (3 regular, super³)
This grptype conforms to the Blue-Book standard signals. if the grptype=regular then the st_signal for DD calls is ST. Else, if the grptype=super then the st-signal is ST2P for DD calls. All OA calls will be routed to the route specified in 'nodigpos' field. If the nodigpos=none then all calls will default to the cama-position.
- 2) DPDEFANI (3 cama, tsps, treat³)
This field determines the fate of calls with an no ANI on a 'DP' trunk. If the dpdefani field is set to 'treat' then the call will endup to a hard-coded 'TOLL_DENIED' treatment.

SC Trunk-group field 'NODIGPOS' is being used to route the call to a TSPS/TOPS (OP) outgoing-trunk.

The SC-to-OP connection is a joint-hold connection.
hold connection.

For the AMR5A Signalling-Format, we also use the SC trunk group. The Regeneration of ANI in AMR5A format is handled

by the SC-to-OS connection. OS trunk is used for outgoing AMR5A calls from a toll office only. (The local calls are handled by 'A5' trunks).

SC trunks are also capable of terminating on the RC (Recording Completing) trunks as part of the TROOTS feature. The coin-control capability on these type of calls is being implemented by the feature R0207 (BCS11).

Feature R0139 did not allow for handling of the coin-control signals back to the originator, however the supervision can be passed back and forth between the terminals.

The feature R0395 will enable the SC-to-OP calls and the SC-to-OS calls to handle the In-band Coin-Control Signals.

NTX193AA01 Status: RTM 4X OPERATION - AMR 5 FORMAT ANI

NUMBER IDENTIFICATION/CHARGING :	
NORTH ELECTRIC ANI (RECEIPT AND REGENERATION)	F0611
SWITCHING AND TRANSLATION :	
COIN CONTROL CAPABILITY ON SC TRK GROUPS	F2395

Package	NTX193AA01 4X OPERATION - AMR 5 FORMAT ANI
Feature set	SWITCHING AND TRANSLATION
Feature	COIN CONTROL CAPABILITY ON SC TRK GROUPS
Feature no	F2395

BACKGROUND -

Feature R0139 provided capability to regenerate ANI (Bell-Format) which it receives on CAMA trunks. This function is required when DMS receives mixed traffic (Coin, etc) on CAMA trunks. All 1+ (noncoin) traffic will be billed and routed by the DMS. The Operator-Assisted (OA) traffic will be routed to either TSPS or TOPS office.

The call-type information is present on the called number 'ST' digit for MF trunks and on the ANI for the DP trunks. The DMS is capable to decide depending upon the trunk-group data and the call-type information whether to route the call to a TSPS/TOPS route or not.

Two new fields are used in the 'SC' trunk-group for the BELL signalling-format to indicate the type of traffic and the default route. These two fields are:-

- 1) GRPTYPE (3 regular, super³)
This grptype conforms to the Blue-Book standard signals. If the grptype=regular then the st_signal for DD calls is ST. Else, if the grptype=super then the st_signal is ST2P for DD calls. All OA calls will be routed to the route specified in 'nodigpos' field. If the nodigpos=none then all calls will default to the cama-position.
- 2) DPDEFANI (3 cama, tsps, treat³)
This field determines the fate of calls with an no ANI on a 'DP' trunk. If the dpdefani field is set to 'treat' then the call will end up to a hard-coded 'TOLL_DENIED' treatment.

SC Trunk-group field 'NODIGPOS' is being used to route the call to a TSPS/TOPS (OP) outgoing-trunk.

The SC-to-OP connection is a joint-hold connection.
hold connection.

For the AMR5A Signalling-Format, we also use the SC trunk group. The Regeneration of ANI in AMR5A format is handled

by the SC-to-OS connection. OS trunk is used for outgoing AMR5A calls from a toll office only. (The local calls are handled by 'A5' trunks).

SC trunks are also capable of terminating on the RC (Recording Completing) trunks as part of the TWOODS feature. The coin-control capability on these type of calls is being implemented by the feature R0207 (BCS11).

Feature R0139 did not allow for handling of the coin-control signals back to the originator, however the supervision can be passed back and forth between the terminals.

The feature R0395 will enable the SC-to-OP calls and the SC-to-OS calls to handle the In-band Coin-Control Signals.

NTX195AA05 Status: RTM MECHANIZED LOOP TESTER (MLT) I/F

INTERFACES	:	
MLT - PHASE I		F2441
MLT - ENHANCEMENT		F2499
MAINTENANCE	:	
LINE TEST DESK INTERFACE		F5414
MAINTENANCE AND TESTING	:	
INCOMING TEST TRUNK (2X90AD) ENHANCEMENTS(CC)		F5563
MAINTENANCE	:	
SCM LINE MONITOR ACCESS		F6333

Package	NTX195AA05 MECHANIZED LOOP TESTER (MLT)	I/F
Feature set	INTERFACES	
Feature	MLT - PHASE I	
Feature no	F2441	

FUNCTIONAL DESCRIPTION

Feature R0441 is done to support AT&T requirements for both the Mechanized Loop Tester (MLT) and the #14 LTD signalling type.

As far as hardware is concerned, nothing new is needed : the NT2X90AB trunk will be used. The feature thus requires only enhanced software. This new software will be optional, and both old and new versions can coexist, and be chosen on a trunk group basis.

The following is a summary of the data changes, plus a list of the course of events gone through by the LTD and MLT trunks, with the differences between present and enhanced versions pointed to. Version 1 indicates the present version, and version 2 the optional one. High priority changes are marked BCS11. Low priority changes are marked POST_BCS11, and will be done in BCS12.

DATA CHANGES

NOTE : All the following changes are for table TRKGRP, and for trunks of group type TD.

A) a new field, VERSION, will indicate if this trunk should have the normal or optional version. The versions are BASIC (normal), MLT or TSTDK (both optional and following version 2).

³³ BCS11 ³³

B) if the version is MLT or TSTDK, two new fields will be present :

REV will indicate the amount of time, in tens of milliseconds, of the delay given before giving either T/R reversal or T/R back to normal. (cf 1a and 3b).

OPEN will indicate the amount of time, in the same unit, for which an open on the S_lead is ignored after T/R back to normal (after the end of dialling) and before getting low -ve current. (cf 3b).

³³ BCS11 ³³

C) if the VERSION indicates the optional version, another new field, TDTYPE, will indicate if this is a NOTEST (the only kind provided now) or a REGULAR (non no_test) trunk.
33 POST_BCS11 33

1) SEIZURE AND PRE DIAL STAGES

-> the Test Desk seizes the 2X90AB by placing a loop closure placed across the Tip & Ring, and the 2X90AB acknowledges the request by completing the S_lead to ground, causing a light negative current to flow.

1a) prepare to receive digits :

Version 1

- wait endlessly for high -ve current.
- once it is present, wait forever for a receiver (MF and DIGITONE), or prepare for DP digits reception.

Version 2

- prepare for digits reception. For MF or DIGITONE : a 30 seconds timer is updated. Keep trying to get a receiver until the time has expired, in which case do the overflow sequence if the T/R is bridged, or do the disconnect sequence if the T/R is open.

33 POST_BCS11 33

- upon getting a receiver, delay for the amount of time specified in the field REV of table TRKGRP, then reverse T/R.

33 BCS11 33

- wait at most 5 seconds for high -ve current. If it times out, do the overflow sequence. Else, proceed.

33 BCS11 33

1b) start outpulsing and collecting digits.

Version 1

Reverse T/R to acknowledge the start of dial signal, and check that high -ve current remains on the S_lead. If the tester abandons while we collect digits (low -ve current), go to the overflow sequence.

Version 2

If negative low current (abandon), return T/R to normal. Then, if T/R is open, go to the disconnect sequence.

if T/R is not open, go to the overflow sequence.

33 BCS11 33

-> outpulse digits : 4, 5, 6 or 7 digits mean a DN,
11 + 7 digits mean a LEN.

N.B: the number of digits to be dialled (DN) depends on the datafill in table TRKGRP (field DIGREGEN).

2) DIAL AND CONNECT STAGES

-> get digits or last_digits msg : process digits before getting
the end of dial signal (low -ve current).

-> load digits and proceed through translation.

-> if line has SUS or PLP and was dialled by DN, go to the intercept sequence. If it was dialled by LEN, continue normally.

3) POST DIAL STAGE

3a) Version 1

wait until getting negative low current on the S lead before proceeding.

Version 2

- negative low current means disconnect sequence if T/R is open,

overflow sequence if T/R is closed.

- no negative low current means proceed.

33 BCS11 33

3b) Version 1

Return the T/R to normal only just before the supervision stage (after having checked the line's state).

Version 2

- since we proceed before getting the end of dial signal, delay for the amount of time specified in the field REV of table TRKGRP, then return the T/R to normal right now to acknowledge that all the necessary digits have been received.

- ignore an open on the Sleeve_lead for the amount of time specified in the field OPEN of table TRKGRP.

33 BCS11 33

-> establish the Test Access Network connection. If there is an overflow condition, go to the overflow sequence.

-> if the line is in intercept, go to the intercept sequence.

3c) check the state of the line and act accordingly.

Version 1

LINE IDLE => give OUT access, go to supervision stage.

LINE BUSY => give MONITOR DC access (i.e. bridge), go to supervision stage where we wait indefinitely for the line to become idle or lockout, in which case OUT-access will be given and we go to testing_mode as for a normal idle line.

If the line has the NDC option, go to the overflow sequence.

Version 2

LINE IDLE

=> wait for -ve low current for 30 seconds, and do the overflow sequence if timeout occurs. Else, upon getting -ve low current, give OUT access and go to supervision.
33 BCS11 33

LINE BUSY

=> NOTEST trunk : wait for -ve low current during 30 secs. If time expires before getting -ve low current, do the overflow sequence. Else, upon getting -ve low current, give monitor_dc access (i.e. bridge access), then execute the disconnect sequence.

33 BCS11 33

If the line has the NDC or the NLT option, go to the overflow sequence.

33 BCS11 33

=> REGULAR trunk : give busy_regular sequence :

- if the S-lead current is still -ve high (i.e. the tester hasn't signalled end of dial yet), give low_tone at 60 ipm and go to the disconnect sequence after 30 secs if the S_lead did'nt change to -ve low.
- if the S-lead current is -ve low, give low_tone at 60 ipm with ground on R-lead, then go to the disconnect sequence.

33 POST_BCS11 33

NOTE : Note that version 1 gives more flexibility for notest trunks when the line is busy : the option to wait for the busy line to change states is given.

4) SUPERVISION STAGE

-> we are now connected to the line through the MTA in the OUT_mode.

-> TESTING_MODE : we are now waiting for something to happen to the S_lead to act accordingly.

- negative high current => disconnect.

- positive high current => do digit_test and come back.

- S_lead open => give line signature (version 1), except if MLT is used (version 2, BCS_11).

=> give DC IN_ACCESS (same as dc bridge_access).

-> the differences between versions 1 and 2 start when we are in the in_access stage.

4a) we are now in the bridge_mode.

-> once in the bridge_access, we wait for the normal -ve low current on the S-lead. Then, we restore the clear dc test path (OUT_mode) and we go back to testing_mode.

-> if the T/R is bridged :

Version 1

- we go through a normal line origination process (with bridged access to the line, DMS can't differ between the trunk T/R closure and the line T/R closure; it sees both as a line orig-

ination). If the line has denied service, the tester will get the normal treatment (silent tone); else, he will hear dial tone.

We then wait for low current on the S_lead, give OUT access and go back to the testing_mode.

Version 2

- if the line has service, we supply dial tone for a maximum of 30 seconds. If the line has denied service - by denied service is meant the line has DTN (denied termination) or DTN + DOR (denied origination); NOT just DOR - a one second burst of dial tone is given, after which we recheck the state of the T/R. This goes on for a maximum of 30 seconds. This process is stopped either if the T/R loop is removed or if the S_lead shows any current. In that case, we go back to the beginning of the testing_mode.

If there is timeout, we restore OUT access.

33 POST_BCS11 33

NOTE ON UNEXPECTED SIGNALS

- > all unexpected signals will force the call into the overflow sequence.
- > if unexpected signals come during the overflow sequence, they will be completely ignored, and will affect neither the timing nor the course of the sequence.

5) OVERFLOW AND DISCONNECT SEQUENCES

-> GENERAL : in version 1, we have had the -ve low current on the S_lead already, to indicate the end of dialling (cf section 2); so, we basically wait for a -ve high current before disconnecting. In version 2, however, we might still receive -ve high current, in which case we wait for the end of dial signal (-ve low) and then wait for the disconnect signal (-ve high current) before disconnecting.

5a) OVERFLOW :

Version 1

send a low_tone at 120 ipm and wait endlessly for -ve high current on S-lead before disconnecting.

Version 2

- negative high current on S_lead => send low_tone *120 ipm for a maximum of 30 secs. If the current changes to negative low, restart the timer and do as below. If we time out before the current changes, do the disconnect sequence.

- negative low current on S_lead => send low_tone *120 ipm, with a ground on the R_lead and a dry tip condition (open tip), either for 30 secs or until the reception of the disconnect signal (high -ve current). Then, go to the disconnect sequence.

³³ BCS11 ³³

5b) DISCONNECT :

Version 1

wait endlessly for high -ve current on the S-lead.

Version 2

wait for 30 secs only for high -ve current. If time has expired, open S-lead and disconnect.

³³ BCS11 ³³

6) INTERCEPT SEQUENCE

6a) Version 1

once in intercept, we don't care about the Test Desk scans anymore : the call is handled like a trunk to line call, so we go through the line's treatment routing (intercept announcements, tones, etc) and then recover the trunk, which will go to LOCKOUT.

Version 2

there is a continuous scan for -ve low current.

- S_lead negative low : give intercept announcement plus ground on R_lead plus an open tip for REGULAR trunks and steady 480 Hz plus ground on R_lead plus an open tip for NOTEST trunks

either during 30 secs or until receiving the disconnect signal (high -ve current). Then, go to the disconnect sequence.

- S_lead negative high : end of dial hasn't been signalled yet. give intercept announcement for REGULAR trunks and steady 480 Hz for NOTEST trunks during 30 seconds, after which go to the disconnect sequence.
- If the current changes to -ve low, go immediately to the sequence defined above after having reset the timer for another 30 secs. (i.e., basically, add ground on R_lead and proceed with the treatment routing).
- 33 BCS11 33

NOTE ON THE HARDWARE

It should be checked that the test desk, in the office, is not too close to the DMS switch (in fact, the S_lead current should not exceed 110 milliamperes), else some problems might occur due to the insufficient amount of resistance present. In that case, a resistance of roughly 750-1000 ohms should be added to the S_lead. This applies particularly to the #14 LTD and to the LTC #3, which have a relatively low interior resistance (about 150 ohms).

DIFFERENCES WITH THE SPEC

- > REGULAR trunks will be provided only in BCS12.
- > changes indicated in 1a and 3c will be provided only in BCS12.
- > bridge_access and T/R bridged correspond to a line origination. The tester will thus hear dial tone, or silent tone if line service is denied. The sequence of the flowchart (page 4) will not be done at this time.

OPERATIONAL MEASUREMENTS

There will be no change in OMs, but this section describes how the behaviour of the Test Desk will be reflected in the existing OM tables. We will consider table TRK (keyed by the trunk's group number and external identifier), table OFZ (which reflects the whole office's traffic).

1) table TRK :

INCATOT will be incremented whenever an incoming seizure is detected on the trunk.

PRERTEAB will be incremented whenever an incoming call attempt was abandoned before routing was completed, i.e. if we do not get high negative current after origination, or if the end of dial signal (low -ve) is received before returning T/R to normal (cf. 1A, 1B and 3A).

INFAIL will be incremented whenever unexpected progresses in the call happen : all timeouts, overflow and disconnect forcings will all be reflected in this field. (cf. Unexpected Signals, 5A, 5B and 6A).

2) table OFZ :

NIN will reflect the total number of incoming seizures (cf INCATOT in TRK).

INANN shows the total number of trunks who were connected to announcements (cf 6A intercept sequence for regular trunks).

INTONE shows the total number of trunks who were connected to a tone through routing (cf 6A intercept sequence for regular trunks). This field does NOT include giving the overflow sequence. It is pegged only when the tone is part of routing in an intercept sequence for regular trunks.

INABDN shows the total number of abandons before connection (cf PRERTAB in TRK).

INTRM shows the total number of trunks initially routed to a line, regardless of the line's state (will be pegged whenever the 2X90 will be connected through the MTA to a valid line). So does TRMNWAT. (see also tables SITE and LMD).

Note that tables TONES, ANN, RCVR and LMD will be pegged as well, in the same fashion as they are for other types of trunks.

Package	NTX195AA05 MECHANIZED LOOP TESTER (MLT)	I/F
Feature set	INTERFACES	
Feature	MLT - ENHANCEMENT	
Feature no	F2499	

FEATURE DESCRIPTION

This feature completes the AT&T requirements for an interface to both the Mechanized Loop Tester (MLT) and the #14 LTD signaling type.

The first part of these requirements was done in feature R0441 for BCS11. Please refer to the R0441 DID - attached at the end of this DID in R0499RF section - for a more global view the MLT feature, as the present DID deals only with the additional requirements to be made.

DATA CHANGES

NOTE : All the following changes apply to table TRKGRP, and for trunks of group type TD only.

- A) if the field VERSION indicates the optional version (MLT or TSTDK), a new field, LESSD, will indicate the treatment to follow if insufficient digits were received. This field can take the value of OFLO or ICPT. A value of OFLO will route the call to the MLT overflow sequence (low_tone + ring_to_ground both intercepted at 120 ipm and a dry tip for a maximum of 30 seconds, then the disconnect sequence), and a value of ICPT will route the call to the MLT NOTEST intercept sequence (steady high_tone, ground on R_lead and a dry tip for a maximum of 30 seconds, then disconnect sequence).
- B) for trunks with a VERSION of TSTDK only : a new field, TKTYP, will indicate if the trunk is NOTEST or REGULAR (non_notest).
- C) a new treatment will be added in table TMTCNL for position LNT; it is called TDBR. See part 3 for explanation. It will be datafilled to go to a new tone (1SECDIAL) providing 1 sec of dial tone and then to lockout.
- D) for trunks with a VERSION of MLT or TSTDK only : a new field, STARTDIAL, will indicate if the dialling is permitted to start before getting high negative current with T/R

bridged (STARTDIAL=POSTHNC) or before (STARTDIAL=PREHNC).
Note that the first value is the accepted standard.

d50

additional requirements

1) RECEIVER TIMEOUT

- see R0441 DID, (1a).
- this applies to MF and DIGITONE only.

- if we must wait for a receiver, start a 30 seconds timer and monitor the Tip/Ring loop :
- > T/R open : go to the disconnect sequence.
- > T/R closed : if the time has expired, go to the overflow sequence. Else, keep monitoring the T/R loop and trying to get a receiver.

2) REGULAR TRUNKS AND ALL ASSOCIATED SEQUENCES

- for trunks of version TSTDK, a datafillable choice of REGULAR or NOTEST will be provided. The NOTEST trunks will follow the same sequences as the trunks of VERSION MLT. Two new sequences have to be implemented for REGULAR (non_notest) trunks.
- see DID R0441, (3c) and (6a).

2a) BUSY_REGULAR SEQUENCE :

- this happens when a regular trunk tries to connect to a busy line.

- > S_lead negative high : give low tone at 60 i.p.m.. If the current changes to negative low before 30 seconds have expired, do the sequence below. Else, do the disconnect sequence.
- > S_lead negative low : give low tone and ground on the R_lead, both interrupted at 60 ipm, plus a dry tip condition, for a maximum of 30 seconds. If timeout occurs before receiving the end of dial signal (high negative), do the disconnect sequence.

2b) INTERCEPT SEQUENCE FOR REGULAR TRUNKS :

- this happens when a regular trunk dials an intercept number.

- > S_lead negative high : go through the trunk's normal routing for that particular treatment. If the current changes to negative low, switch to sequence below. No timer is operating,

and the trunk will disconnect only upon reception of the disconnect signal.

- > S_lead negative low : go through the normal treatment routing, or the remaining part of it if we come from the above sequence, and add ground on the R_lead plus a dry tip. No timing is provided, and only the disconnect signal will idle the trunk.

3) SPECIAL BRIDGE MODE SEQUENCE

- when the test sequence is in the 'testing_mode' (i.e. the trunk is connected OUT to an idle line, waiting on the S_lead state) and the S_lead goes open, IN (BRIDGE) access to the line is given.
- see DID R0441, (4a).

New requirements :

-> T/R bridged :

=> if line has one of the following options : suspended service (SUS), requested suspended service (RSUS), plug_up (PLP), or activated random_make_busy (RMB) :

give a 1 second burst of dial tone.

NOTE : in fact, the line will go to the new treatment TDBR (TESTDESK_BRIDGED) when this happens. This treatment will be datafilled to give 1 second burst of dial tone, and to go on to lockout. It can be modified by the telco. (cf. R0499DS).

- note that if the line has SUS or PLP, we will get to this sequence only if the number was len_dialled. Else, (dn_dialled), we would have gone, much earlier, to the intercept sequence. See DID R0441, (2).

=> all other cases :

give normal line origination sequence (same as for BASIC version).

-> T/R open :

keep monitoring changes in the S_lead current. If it remains open, keep monitoring the T/R loop. Do the sequence above whenever the loop goes from open to closed : the tester might want to hear the dial tone several times.

- IMPORTANT NOTE :

Once the 2x90 trunk is connected to an idle line through the MTA, the TAN_CUT relay is operated, thus occupying the Tip and Ring and disabling the loop detector. However, operating the 2X90's T/R loop in the bridge mode is equivalent to operating the line's loop.

Therefore, to implement the above sequence, it is the line's loop which will be monitored, not the 2X90's loop. Thus, a 'real' subscriber's origination and the tester's operation of the loop cannot be distinguished.

This might have two adverse effects :

1) on the subscriber :

if the subscriber goes off_hook while the tester is in IN_access, (S_lead open), and if he has SUS, RSUS, PLP or activated RMB, he will hear a 1 second burst of dial tone. 2)

on the tester :

if the subscriber goes off_hook while the tester is in the IN_access, (S_lead open), the tester will go through the T/R bridged sequence described above, even though he did not

himself close the T/R loop (this happens right now with the BASIC version too).

4) INSUFFICIENT OR TOO MANY DIGITS RECEIVED

- see DID R0441, (1b).
- end_of_dialling is determined either when the ST pulse is received (MF) or when the time indicated in PSPDSEIZ of table TKSGRP is exceeded (MF or DT).

4a) INSUFFICIENT DIGITS :

- if insufficient digits were received, after returning the T/R back to normal, the call will be routed to either the overflow sequence or the NOTEST intercept sequence, as indicated in the customer_fillable new LESSD field (OFLO or ICPT) in table TRKGRP (note : presently, it always goes to the overflow sequence).

4b) TOO MANY DIGITS :

- if too many digits were received, after returning the T/R back to normal, the call will be routed to the overflow sequence (note : this is done presently already).

5) CASE OF NOTEST TRUNK TO BUSY LINE

- see DID R0441, (3c).
- when a NOTEST trunk tries to connect to a busy line, presently, bridge_access is given for a maximum of 30 seconds, and the disconnect sequence is executed.

New requirement :

- indefinite CAMP_ON is permitted :
- > S_lead -ve low : give OUT access if the line becomes idle or lockout.
- > S_lead -ve high ; disconnect immediately.
- > all other states : unexpected signals, so do overflow sequence.

- note that this is the same as for the BASIC version.

6) STARTDIAL FIELD

- startdial = posthnc : this is the normal case : no dialling is permitted before high negative current plus t/r bridged is received. overflow is given if we do not receive this current on the sleeve within 5 seconds after t/r reversal.

- startdial = prehnc : can dial before giving high negative current, after dms has given t/r reversal, but overflow is given either if the high current is not received within 5 seconds after the t/r reversal, or if all digits are dialled and we still do not have high negative current.

Package	NTX195AA05 MECHANIZED LOOP TESTER (MLT)	I/F
Feature set	MAINTENANCE	
Feature	LINE TEST DESK INTERFACE	
Feature no	F5414	

FEATURE SYNOPSIS

This feature provides support for a line test desk interface for the SLC-96 RCS. Metallic access to SLC-96 subscriber loops is established, line card diagnostics invoked and results reported.

FEATURE DESCRIPTION

The test facility interfaces to the DMS-100 via a new test trunk, 2X90AD. The test trunk emulates the pair gain test controller (PGTC) utilised by the SLC-96 carrier to interface with a loop testing system.

Initiation of the test is accomplished by seizure of the test trunk and dialing of the DN to be tested. The DMS-100 responds with busy, intercept or on hook sequence depending whether the line is in use, out of service or free respectively.

The test desk proceeds to the test by issuing a "bypass initiate signal" and the DMS-100 responds by connecting the metallic test pair to the loop and to the test trunk.

The DMS-100 performs the line card extended diagnostic, loop testing takes place from the test desk.

The results of the diagnostic are reported by signatures applied to the test trunk in response to a sleeve change from the test desk. An applique circuit is required to support the dc signals utilised to report channel test results. The applique circuit is connected between the metallic test pair and the 2X90AD.

The applique circuit is controlled by SD points.

References:

BC1373, BC1428, BF0511

Package	NTX195AA05 MECHANIZED LOOP TESTER (MLT)	I/F
Feature set	MAINTENANCE AND TESTING	
Feature	INCOMING TEST TRUNK (2X90AD) ENHANCEMENTS(CC)	
Feature no	F5563	

FEATURE SYNOPSIS

This feature provides enhancements to the CC software which drives the 2X90AD test trunk for use with the SLC-96 remote concentrator.

FEATURE DESCRIPTION

Changes are made to invalidate fields in table TRKGRP when the trunk group type is mechanized loop test (MLT) or local test desk (LTD). Fields affected are: REV, STARTDIAL, OPEN, LESSD.

A new field DGGTST is added to indicate if the digit test utilizes an external receiver or that provided as part of the NT2X90 test trunk card.

Ref: BC1693

Package	NTX195AA05 MECHANIZED LOOP TESTER (MLT)	I/F
Feature set	MAINTENANCE	
Feature	SCM LINE MONITOR ACCESS	
Feature no	F6333	

FEATURE SYNOPSIS

This feature provides monitor access from the test desk for RCU (DMS-1 Urban) and RCS (SLC-96) lines. This will be accomplished by using conference circuits.

FEATURE DESCRIPTION

Test Desk (TD) refers to the equipment external to the Digital Multiplex System (DMS-100). It is used by a craftsperson to test lines supported by the DMS-100. If a line to be tested is in talking state, a bridge connection is set up so that the craftsperson can verify that the line is in use. The bridge connection is not available for lines mounted in Remote Carrier SLC-96 (RSC) and Remote Carrier Urban (RCU), due to hardware restrictions. This feature uses a conference circuit to form a three way connection among the test desk and the other two parties in talk connection so that a busy line can be verified by the craftsperson.

Ref: DDOC AF0529

NTX196AA02 Status: RTM CALLING NUMBER ANNOUNCEMENT (CNA)

SERVICES	:	
CALLING NUMBER ANNOUNCEMENT (CNA)		F2468
ADMINISTRATION	:	
CNA ENHANCEMENTS		F2688

Package	NTX196AA02 CALLING NUMBER ANNOUNCEMENT (CNA)
Feature set	SERVICES
Feature	CALLING NUMBER ANNOUNCEMENT (CNA)
Feature no	F2468

FEATURE SYNOPSIS

INTRODUCTION

The Calling Number Announcement(CNA) feature will be offered as an alternative to the existing hardware Automatic Number Announcer Circuits(ANAC). ANAC requires a dedicated trunk interface from the DMS to the ANAC hardware for ANI spill and voice response purposes.

The function of ANAC is to playback the calling number over the ANA trunk. This ability is used by telco inside and outside personnel to verify service order/line transfer cross-connections, identify pairs in the event of a cable cut and verify assignment records.

DMS Digital Recorded Announcement (DRA) facilities will be used to playback the calling number to the line or to a loudspeaker. When playing to a loudspeaker playback to the line will still occur.

The feature will be implemented as an announcement and will therefore make use of table ANNS and associated tables. The announcement CLLIs must be allocated on the basis of one clli for playing to a line and one clli for each loudspeaker. These CLLIs can be formed into a route list if desired.

³³ important ³³ This feature does not require any software or hardware developed for MCCS support facilities.

GENERAL

The announcement will be composed of the digits in the directory number(d.n.) associated with the line. For the North American Numbering plan this is a seven digit d.n.. There are no explicit pauses between digits except as recorded with each digit. If a pause id desired before or after the silence can be inserted in table DRAMTRK.

When the announcement is finished playing or the line could not be identified routing to the next element of the route list will occur.

This feature will require datafilling a new announcement of CNA to a line(CNAL) and for CNA to a loudspeaker via a trunk(CNAT). Adding a new announcement is done by adding a new CLLI to table CLLI and using this new CLLI to datafill table ANNS and ANNMEMS. When datafilling table ANNS, MAXCYC will normally be one, MAXCONN must be one(1) and CYTIME should be of sufficient length to allow full announcement playback.

Table ANNS has recently acquired a new field called ANNTYPE. This field is used to identify which announcements are of a special type. For CNA this field will be CNAL for playback over the tip and ring of the line and CNAT for playback over a trunk to a loudspeaker.

Table DRAMTRK will have two new external phrase numbers(CNAENG and CNAFRE) which, along with silence, can be used to datafill the PHRASELIST for CNAL and CNAT. These external phrase names will only be valid in offices with the CNA feature.

When CNAT is entered in table ANNS the ANN clli will be used to get the trunk clli to which the announcement is to be played.

AFFECTED TABLES

1) CLLI

New announcement CLLIs must be datafilled in this table. The requirements are a clli for each playback to a line or loudspeaker.

2) ANNS

Each of the above cllis will require datafill in this table to be valid. The ANNTYPE field must be CNAL for announcement playback to a line and CNAT for playback over a loudspeaker. The field MAXCYC would normally be set to one(1) but more cycles could be allowed should the need arise. The field MAXCONN should only be one as announcements are customized based on the calling number. The field CYTIME should have a value which will allow the announcement to play completely, for seven digits a time of five seconds is sufficient.

3) ANNMEMS

Each member of the above CLLIs must be datafilled here. If the ANNTYPE in table ANNS is set to CNAT or CNAL then only DRAM will be allowed as the

hardware type. One track per language should be filled in this table as for other announcements.

4) DRAMTRK

The tracks for the member as datafilled in ANNMEMS should contain one of the compound phrases CNAENG or CNAFRE. It is possible to have both english and french digits on the same track as long as no other phrases are used (such as silence) and ALL digits are on the same card, this also requires that directory numbers be no more than seven digits. It is recommended however that one track be used for english digits and one for french digits, it would then be possible to use one or two other phrases such as silence to give a pause. It is important to note that the standard digit phrases (eng1, eng2, fre1 etc) are used and they therefore must be recorded in the office.

5) STDPRTCT/HNPACONT/DN/WRDN/IBNXLA

Any one of these tables can be datafilled to route to the Calling Number Announcement. These tables are datafilled in the usual manner for routing to an announcement CLLI. Some of the selectors which could be used are S, N, and T. If the T selector is used it is necessary that one of the routing tables such as OFRT have the routes to the cna CLLIs datafilled. The number of digits to dial to access CNA is also dependant on the table selected to route to it. For example if STDPRTCT is selected then anywhere from one to eighteen digits could be datafilled as the access code.

6) LCASCRCN

This table may require changes to the LCASCR subtable to ensure that the first three digits dialled after any prefix deletion is done are classified as local to avoid billing the calls.

7) CNALDSPK

This table is used, when the CNAT is datafilled in the field ANTYPE in table ANNS, to identify over which trunk the announcement should be played to. This trunk is the one to which a loudspeaker is attached (on the tip and ring). The trunk card selected for this purpose can be any outgoing analog trunk card. Care should be taken in selecting the trunk to ensure that there is a reasonable impedance match.

ORIGINATORS SUPPORTED

- a) STANDARD and EXTENDED lines
- b) IBN lines - in an IBN office a seven digit dn shall be retrieved for the station.
- c) PBX trunks(p2 and px)- the trunk group billing number will be 135 retrieved.
- d) 2/4 party lines - Oni lines can not be identified i.e. four party coded ringing lines.
- e) Coin lines - On calls from coin phones the coin will not be collected

NOTES

The above originators can be located at the host office or remote sites.

Three way calls in effect are blocked. Will route to the next item in the route list.

Calls involving the feature processing environment are blocked. Will route to the next item in the route list.

Calls with an attendant involved are blocked. Will route to the next item in the route list.

Package	NTX196AA02 CALLING NUMBER ANNOUNCEMENT (CNA)
Feature set	ADMINISTRATION
Feature	CNA ENHANCEMENTS
Feature no	F2688

FEATURE SYNOPSIS

This feature enhances the Calling Number Announcement (CNA) feature F2468. It increases the number of choices of where the announcement is broadcast by adding the announcement over the loudspeaker only.

FEATURE DESCRIPTION

The CNA feature allows Telco personnel to dial an access code from a line in order to hear the directory number associated with that line.

Currently the Telco can select the announcements to be broadcast to the line or to the line and loudspeaker.

This feature adds the choice of announcement over loudspeaker only.

This feature also enables multitrack (ie, bilingual) announcements to be broadcast.

Ref: BR0688 FDOC

NTX197AA01 Status: RTM CCIS DIRECT SIGNALLING

SIGNALING AND SUPERVISION :
CCIS DIRECT SIGNALLING F0560

Package	NTX197AA01 CCIS DIRECT SIGNALLING		
Feature set	SIGNALING AND SUPERVISION		
Feature	CCIS	DIRECT SIGNALLING	
Feature no	F0560		

FEATURE DESCRIPTION

Direct signalling provides a flexible framework of routing data messages over the CCIS network. Direct Signalling messages (DSM) differ from other CCIS messages in that they are not routed according to preassigned link paths. A DSM message can thus be injected anywhere in the CCIS network and get routed to the appropriate destination. It is this flexibility that allows new network services such as INWATS and MCCS (mechanized calling card service) to evolve in that these services will have access to distributed data bases.

This feature is functionally split into three areas. The first area is the called the Direct Signalling carrier subsystem. This area provides a message transfer part (MTP) to allow users access to the CCIS data bases. The second area provides an interface between the low level CCIS Direct Signalling area and the INWATS call processing. The third area provides an interface between the low level CCIS direct signalling area and the MCCS call processing.

The DS MTP area will encompass the following :

1. DS LOAD BALANCING ALGORITHM

Switching offices gain access to the Direct Signalling data bases via their A links. All links out of a node that terminate upon a common far-end node form a signalling link pool. Two link pools form a combined link pool if the pools terminate upon two different nodes but carry DS traffic destined for a common function. Therefore all the A links out of a switching office form a combined pool. Selection of a signalling link from a signalling link pool is called the Direct Signalling load balancing algorithm. The load balancing algorithm should be accomplished in such a way that the links carry equal amounts of total traffic including banded and DS traffic. Load balancing is affected by signalling link abnormalities such as link failures, link overloads, etc., When offices have light direct signalling traffic compared with banded traffic an elaborate load balancing scheme is not required but can be implemented by uniformly distributing direct signalling traffic over all available links in the pool. This scheme has been implemented for bcs14. The load balancing algorithm will cycle through all the links in the pool searching for an available one.

2. DS DATA INTEGRITY

Implementation of the Direct Signalling translation test is required. This is a general procedure for testing the integrity of the network routing data.

3. DS MESSAGE FORMATTING

Formatting DS message and decoding DS messages

4. DS CCIS NETWORK MANAGEMENT

Implementation of controls that are to be put into effect in response to messages returned due to blocking or congestion in the network. This controls can be either "6" or "3" or "0" digit controls, where "0" digit refers to blocking all DS traffic.

A 3 digit control has been implemented for the DS message transfer part network management function. This corresponds to taking controls on the 3 most significant digits of a MCCS query (either the NPA or RAO) for the MCCS application. For the INWATS application controls will be applied on the 3 most significant digits which corresponds to controls on all 800 queries.

When a DS message is returned due to blocking in the network, controls will be applied for approximately 2 minutes. These controls consist of blocking all direct signalling messages destined for the same address (3 most significant digits) for the first 10 seconds. For the remaining of the control period at most one direct signalling message destined for the blocked address will be released every 10 seconds.

When a DS message is returned due to congestion encountered in the network, controls will be applied to regulate all direct signalling messages destined for the same address (3 most significant digits) by releasing at most one such direct signalling message every 10 seconds for a period of at least 2 minutes.

5. CCIS DS PERFORMANCE MEASUREMENTS

Implementation of logs and operational measurements. The DSMTP om group collects measurements associated with the performance of the DS Message Transfer Part system. They report abnormal conditions encountered in CCIS network which prevent a message from reaching its destination. These conditions include local blocking or conditions encountered in the network such as network blocking or congestion.

The requirements for the interface between CCIS DS and the application call processing is described below :

The CCIS DS application interface to call processing is responsible for providing high level procedures to send DS inquires. These procedures will take a digit register as input and perform the necessary "bit crunching" to achieve the appropriate DSM formats described in reference 3 and 4. Upon invocation of this procedure an idle auxiliary call register is selected. Up to 64 of these registers are provided per application. Upon finding an idle register the number is checked to see if any CCIS network management controls have been applied, if not then a signalling link from the pool is chosen according to the DS load balancing algorithm. The message is then dispatched and a timer started waiting for the receipt of the reply. If any failure conditions are encountered i.e. no call registers available, network management blocking in effect, no signalling path available, etc., the call process is immediately informed so that the appropriate treatment can be applied to the call. The CCIS DS application interface receives the DSM replies from the data bases. Upon receipt of these replies the appropriate message is decoded and formatted into a high level message required by the call process. The high level message is sent to the call process according to the information stored in the auxiliary call register. The auxiliary call register is then idled.

The interface for MCCS will cater to two additional requirements :

1. Supplemental Query Data Message (SQD)

MCC queries do not contain information required to perform division of revenue studies, specifically the calling and called NPA - NXX of the telephone call associated with the query. This information is therefore provided on a sampled basis by selecting one out of every n MCCS queries (where n is an ofcparm defined in data schema section) it transmits and automatically transmits an addition DS message which is called a SQD message.

2. MCCS Data Base Overload Controls

Every MCCS DS query reply contains an overload indicator which ranges from 0 to 7. The indicator is normally set to zero. However when the MCCS data base becomes overloaded it sets the indicator to a value greater than zero. When the originating office receives such a reply it will cutback n out of every 8 queries (n is the overload level received in the reply) with the same three most significant address digits (NPA or RAO). These controls should last for a period of 2 to 4 minutes.

NTX204AA02 Status: RTM CCIS BANDED SIGNALLING

SIGNALING	:	
CCIS - BANDED SIGNALLING		F1245
INTERWORKING	:	
CCIS6 - CCS LINE INTERWORKING		F1748
FACILITIES	:	
CCIS - TRUNK TO LINE CP		F3151
CCIS - TRUNK FROM LINE CP		F3152
MAINTENANCE AND TESTING	:	
CCIS - BASIC MAINTENANCE		F3154

Package NTX204AA02 CCIS BANDED SIGNALLING
 Feature set SIGNALING
 Feature CCIS - BANDED SIGNALLING
 Feature no F1245

-----,----- .SP

-----,----- FUNCTIONAL DESCRIPTION (FN)

-----,----- =====

-----,----- .SP AA01³ 0000 .fo on AA01.0001 .US FUNCTIONAL DESCRIPTION
 AA01.0002 .SP AA01.0003 AA01.0004 AA01.0005 AA01.0014 AA01.0015 AA01.0016
 AB01³ 0000 1. Customer View AA01³ 0018 AA01.0019 CCIS Trunk Network Man-
 agement (CCISTNWM) comprises a set of signals which AB01³ 0001 perform al-
 most exactly the same function as the DMS-100 Dynamic Overload AB01.0002
 Control (DOC) signals. AB01.0003 DMS-100 divides DOC into two independent
 facilities: Internal DOC (IDOC) AA01³ 0029 and Remote DOC (RDOC). IDOC re-
 fers to the detection of overload AB01³ 0004 conditions in the DMS-100 and
 transmission of appropriate DOC signals to AA01³ 0031 subtending offices.
 RDOC refers to the reception of DOC signals from AA01.0032 subtending of-
 fices and application of controls on the traffic offered AA01.0033 to the
 trunk groups serving those offices. Refer to NTP 297-1001-452 AB01³ 0005
 for a detailed description of IDOC and RDOC. AB01.0006 AB01.0007 The
 basic principle behind the design of CCISTNWM for the DMS-100 AB01.0008 is
 that the existing IDOC and RDOC capability should be maintained AA01³ 0023
 with CCIS simply providing a new channel for transmission of the DOC
 AB01³ 0009 information. This principle applies well to the IDOC functions
 to be AB01.0010 implemented under CCISTNWM. However, some enhancements
 are required AB01.0011 to the RDOC AB01.0012 functions in order to
 accomodate CCISTNWM. IDOC and RDOC are AA01³ 0035 considered separately in
 the discussion that follows. AB01³ 0013 AB01.0014 Note that no functional
 changes to Autovon Network Management are AB01.0015 planned. Although the
 coexistence of Autovon and CCIS will not be AB01.0016 precluded by any of
 the work performed under this feature, there AB01.0017 are no plans to
 propagate any of the functional changes planned AB01.0018 for Network Man-
 agement into Autovon Network Management. Additional AB01.0019 development
 work will be required in order to make CCIS and Autovon AB01³ 0000 Network
 Management coexist. The only affect this feature will have AB02.0001 on
 Autovon customers will be to add a new field CCS to table AVNMPPLN.
 AB02.0002 At present this field will not be used and will always by set to
 AB02.0003 "N" (No). AA01³ 0036 AA01.0037 AB01³ 0021 2.1 IDOC AA01³ 0094
 AA01.0095 IDOC must provide a facility for transmitting the following
 CCISTNWM AA01.0096 signals: AA01.0097 AA01.0098 BDOC1 - Broadcast
 Dynamic Overload Control 1 AA01.0099 BDOC2 - Broadcast Dynamic
 Overload Control 2 AA01.0100 BDOC3 - Broadcast Dynamic Overload
 Control 3 AA01.0101 RDOC1 - Remove Dynamic Overload Control 1
 AA01.0102 AB01³ 0022 Changes were made to IDOC in a previous feature
 (C0526) AB01.0023 to allow for the AB01.0024 use of different signalling
 modes to transmit DOC signals. No AB01.0025 changes were made to the ex-
 isting logic for detection of the various AB01.0026 DOC conditions,
 though. In other words the same logic for detecting AB01.0027 internal
 overload conditions will continue to be used; CCIS will AB01.0028 simply
 provide another path for the DOC signals to be transmitted. AB01.0029

CCISTNWM presents two new requirements for IDOC, however: AB01.0030 1) repetitive transmission of DOC signals, and 2) transmission of AB01.0031 only one signal at a time. AB01.0032 AB01.0033 BDOC1 and BDOC2 signals transmitted via CCIS must be retransmitted AB01.0034 once a minute for the duration of the overload condition. This AB01.0035 repetitive transmission of DOC signals presents no particular problem. AB01.0036 However, AA01³0107 transmission of only one signal at a time represents a significant AB01³0037 difference from the existing IDOC facility. AB01.0038 Under DMS-100 NWM the three IDOC levels are independent and can AA01³ 0109 be transmitted in any combination. For CCISTNWM the DOC signal AA01.0110 corresponding to the highest active IDOC level will be transmitted AA01.0111 immediately upon a change in highest IDOC level. BDOC1 and BDOC2 AA01.0112 will be repetitively transmitted once per minute thereafter; BDOC3 AA01.0113 and RDOC1 will be transmitted only once. AA01³ 0117 AA01.0118 BDOC3 will be transmitted at the beginning of every restart. This AA01.0119 requirement is explicitly stated in the RFF for feature R0379, but AA01.0120 will be implemented under CCISTNWM. AB01³ 0039 BDOC3 will also be transmitted on total CCC failure. Since the CC cannot AA01³0123 do this (because it is dead), the MSBs will recognize the failure AA03³0000 and will transmit BDOC3 autonomously. See section 2.5 "Other Signals" AA03.0001 for more about BDOC3s on CCC failure. AA03.0002 AA01³0115 Note that the IDOC state of the switch does not survive any restarts. AA03³0003 This means that a signal must be sent at the end of any AA03.0004 restart to notify the CCIS network of the DMS-100's current IDOC AA03.0005 condition. This is done only after all required Reset Band (RSB) and AA03.0006 Trunk Blocking signals have been sent, hence it MAY BE UP TO 5 AA03.0007 MINUTES (assuming 640 bands, 5 RSBs per second) after a cold AA03.0008 restart before we transmit an RDOC1 to permit the CCIS network AA03.0009 to present originations to the DMS-100. AB01³ 0042 AB01.0043 2.2 RDOC AA01³ 0039 AA01.0040 RDOC must provide a facility for receiving and processing the following AA01.0041 CCISTNWM signals:

AA01.0042 AA01.0043 DOCO - Dynamic Overload Control Off (Level 0)
AA01.0044 DOC1 - Dynamic Overload Control Level 1 AA01.0045
DOC2 - Dynamic Overload Control Level 2 AA01.0046 DOC3 - Dynamic
Overload Control Level 3 AA01.0047 IGDOD - Ignore Dynamic Overload
Controls AA01.0048 ENDOC - Enable Dynamic Overload Controls
AA01.0049 AB01³ 0044 The existing RDOC facility provides AB01.0045 a table
which associates scan points AB01.0046 with preplan numbers; when the scan
point closure is detected, the AB01.0047 preplan is applied automatically.
AB01.0048 In contrast, CCIS DOCn signals have a "trigger AB01.0049 band"
which identifies the trunk group AB01.0050 for which the signal applies.
AB01.0051 The trigger band must be converted to a AB01.0052 trunk group
identifier, and this AB01.0053 identifier and the DOC level can be used as
input to a new Common AB01.0054 Channel Signalling Selective Dynamic Over-
load Control (SDOC) facility. AA01³ 0057 AB01³ 0055 2.3 SDOC AB01.0056
AB01.0057 A new table called the CCS Selective Dynamic Overload AB01.0058
Controls table, CCSDOC, associates trunk groups with preplan controls.
AB01.0059 The key of the table is AB01.0060 CLLI and each entry in the table
consists of AB01.0061 three references to controls stored in table
PREPLANS, one reference AB01.0062 for each of AB01.0063 three DOC levels.
See the DS section of this document for details. AA01³ 0066 AB01³ 0064 SDOC

controls are invoked by "applying" the SDOC level to the trunk AB01.0065 group. This can be done either automatically (via reception of a AB01.0066 CCIS DOC signal, for example) or manually (via the 'APPLY' command of AB01.0067 the NWM MAP 'Autoctrl' level). AB01.0068 AB01.0069 An SDOC control is applied to a trunk group by using AB01.0070 the trunk group id to find the trunk group's entry AB01.0071 in table CCSDOC. The preplan number and AB01.0072 control number for the required AB01.0073 DOC level are then used to locate the control to be applied in table AB01.0074 PREPLANS. More than one SDOC control can be manually activated AB01.0075 on a trunk group. The cumulative affect of multiple active SDOC AB01.0076 controls is exactly the same as if the corresponding group AB01.0077 controls had been manually applied on the trunk group. AB01.0078 AB01.0079 SDOC controls are treated much the same as any other automatic AB01.0080 control. They cause fields in the 'Autoctrl' and the AB01.0081 'Grpctrl' or 'Rtctrl' levels of the Network Management MAP to be AB01.0082 incremented AB01.0083 (or decremented), and they can be manipulated in the same way as AB01.0084 any other automatic control via the commands at the AB01.0085 'Autoctrl' level. The only difference between SDOC controls AB01.0086 and the other controls which can be applied automatically AB01.0087 (i.e. IDOC, PPLN, AO CR) is that there is no restriction AB01.0088 preventing an SDOC control applied via CCIS from overriding AB01.0089 a manually applied SDOC control. AB01.0090 The MM section of this document provides more details about AB01.0091 the man-machine interface for SDOC controls. AA03 0089 AB03 0092 2.4 CCIS and SDOC AB01.0093 AB01.0094 CCIS DOCn signals are intended to define a level of reduction of AB01.0095 traffic offered to a trunk group. DOC0 means no reduction; AB01.0096 DOC3 means 100% reduction (i.e. no traffic); DOC1 and DOC2 specify AB01.0097 increasing amounts of reduction. Thus one can think of each AB01.0098 trunk group having a particular DOC level at all times. It would AB01.0099 make no sense for a trunk group to have more than one DOC level. AB01.0100 AB01.0101 In order to implement this model using SDOC controls, AB01.0102 when a CCIS DOCn (n=0,1,2,3) signal is received any SDOC AB01.0103 controls activated by other level signals are first removed. AB01.0104 (This is required because more than one SDOC control can be AB01.0105 active on a trunk group, and because there is no restriction AB01.0106 that the SDOC controls all be of the same type.) AB01.0107 Next, for DOC1, DOC2 and DOC3, the SDOC control for AB01.0108 the received signal's level is applied, AB01.0109 and a timer is set to expire in two minutes. If this timer AB01.0110 expires without another DOC signal having been received, the SDOC AB01.0111 control is automatically removed. AB01.0112 AB01.0113 When an IGD OC signal is received, the controls for SDOC levels 1 AB01.0114 through 3 are removed, and the controls for SDOC levels 1 and 2 AB01.0115 are disabled with the disabling source is set to 'CCIS'. AB01.0116 When an ENDOC signal is AB01.0117 received, controls for SDOC levels 1 and 2 are enabled. Note AB01.0118 that there will be no restriction preventing an ENDOC signal from AB01.0119 from reenabling controls which have been manually disabled. AA03 0010 AA03.0011 AA03.0012 2.5 Other Signals AA03.0013 AA03.0014 The CCISTNWM software will handle a number of miscellaneous signals AA03.0015 which do not fall into the formal definition of Trunk Network AA03.0016 Management signals. First, Group Signalling Congestion (GSC) signals AA03.0017 will

be directed to CCISTNWM from the MSB because the action taken AA03.0018 on reception of a GSC is a trunk network management control in the AA03.0019 DMS-100. When a GSC is received by CCISTNWM, a Network Management AA03.0020 "SKIP" control is applied to all traffic destined for the trunk AA03.0021 group whose band is specified in the GSC signal. This SKIP control AA03.0022 persists for ten seconds, then is automatically removed by CCISTNWM. AA03.0023 AA03.0024 The one other signal which can be received by CCISTNWM is not a CCIS AA03.0025 signal at all. The Are-You-There (AYT) signal is a signal originated AA03.0026 by the MSB's Network Management software when it detects a failure AA03.0027 of communication with the DMS-100 CC. When this happens the MSB AA03.0028 autonomously transmits BDOC3 signals to the CCIS network, and sends AA03.0029 an AYT signal to the CCISTNWM software in the CC. The CCISTNWM AA03.0030 software responds to the AYT with an I-Am-Here (IAH) signal sent to AA03.0031 the MSB, followed immediately by a signal AA03.0032 defining the DMS-100's current IDOC condition (i.e. RDOC1, BDOC1, AA03.0033 BDOC2, or BDOC3).

Package	NTX204AA02 CCIS BANDED SIGNALLING
Feature set	INTERWORKING
Feature	CCIS6 - CCS LINE INTERWORKING
Feature no	F1748

FEATURE DESCRIPTION

General Information

This feature document incorporates the features
CCIS TO LINE CALL PROCESSING and LINE TO CCIS
TRUNK CALL PROCESSING respectively. This feature consists of many small
extensions to the CCIS call processing software. These will allow CCIS
trunks to interconnect with members of the line agency which up until now
were not supported. Please refer to feature number F3151 and F3152 for var-
ious terminators and originators which interwork with CCIS trunks.

Package NTX204AA02 CCIS BANDED SIGNALLING
 Feature set FACILITIES
 Feature CCIS - TRUNK TO LINE CP
 Feature no F3151

FEATURE DESCRIPTION

This feature incorporates the line to CCIS trunk call processing and CCIS trunk to line call processing. This feature consists of many small extensions to the CCIS call processing software. These will allow CCIS trunks to interconnect with members of the line agency.

Currently, this feature provides ring back tone to originator without waiting the line agency to complete its continuity test since

CCIS trunks rarely experience continuity failures. Of these, most would complete before ringing the called telephone, thus not effecting the called party. However, this deficiency will be pursued in the line firmware at a later date.

Connections Already Supported by CCIS

CCIS to Terminator

Connections currently supported by CCIS with CCIS as the originating agent in the call: (i.e CCIS -> ?)

DESCRIPTION

 Tones
 Announcements
 Intertoll 2 way (MF, MF)
 Intertoll 2 way (DP, DP)
 Intertoll outgoing DP
 Intertoll outgoing MF
 Intertoll 2 way (MF, DP)
 Intertoll 2 way (DP, MF)
 Direct inward/outward dial
 pbx trunk (p2/px)
 CCIS trunk
 Outgoing service desk
 2 way tandem trunk(DP,DP)
 Tops trunk dp-dp
 Tops trunk mf-mf
 Tops trunk dp-mf
 Tops trunk mf-dp
 Tops trunk np-mf
 Tops trunk np-dp
 Tops position
 108 Testline

T101 outgoing
 100,102 Testline
 105 Testline
 Outgoing local trunk
 Intercept trunk

Originator to CCIS

Connections supported by CCIS with CCIS as the terminating agent
 (i.e. ? -> CCIS):

 DESCRIPTION

Incama trunk (DP)
 Incama trunk (MF)
 Incama 2 way trunk (DP,DP)
 Incama 2 way trunk (MF,MF)
 Incama 2 way trunk (DP,MF)
 Incama 2 way trunk (MF,DP)
 Intertoll 2 way trunk(MF,MF)
 Intertoll 2 way trunk(DP,DP)
 Intertoll incoming (MF)
 Intertoll incoming (DP)
 Intertoll 2 way trunk(MF,DP)
 Intertoll 2 way trunk(DP,MF)
 Direct inward/outward dial
 pbx trunk (p2/px)
 Tsps dp incoming
 Tsps mf incoming
 CCIStrunk
 Tandem trunk 2 way (DP,DP)
 Tandem trunk 2 way (MF,MF)
 Tops trunk incoming dp
 Tops trunk incoming mf
 Tops trunk incoming np
 Tops trunk dp-dp
 Tops trunk mf-mf
 Tops trunk dp-mf
 Tops trunk mf-dp
 Tops trunk np_mf
 Tops trunk np-dp
 Tops Position
 T101 incoming dp
 T101 incoming mf
 T101 incoming digitone
 Rotl

Tandemddo mf
Tandem ddo dp

The following is a list of connections that are pending further investigation:

Originator Description

3 Ibn dp line
3 Ibn dgt line
3 Ibn dp extended line
3 Ibn dgt extended line
3 Ibn dtmf ic trunk
3 Ibn manual line
3 Key set line
3 Key set auto line
P-phone intercom
Ibn attendant console
Ibn dp ic trunk
Ibn mf ic trunk
Ibn dtmf ic trunk
Ibn co trunk , no digits
Ibn co dp trunk
Ibn co mf trunk
Ibn dp 2 way trunk
Ibn mf 2 way trunk
Ibn dtmf 2 way trunk
Ibn no digs impulsed trunk
Ibn 2w immediate trunk
Ascs
Csdds line dgt
Csdds automatic line
Ibn call transfer
Dms250 carrier T101 incoming
Dms250 carrier T101 outgoing
Dms250 digitone T101
Madn dp extended
Madn dgt extended
Service analysis dialback

Package	NTX204AA02 CCIS BANDED SIGNALLING
Feature set	FACILITIES
Feature	CCIS - TRUNK FROM LINE CP
Feature no	F3152

FEATURE DESCRIPTION

This feature incorporates the line to CCIS trunk call processing. This feature consists of many small extensions to the CCIS call processing software. These will allow the various lines and operator services to interconnect with CCIS trunks.

A list of interconnections are provided in feature F3151.

Package	NTX204AA02 CCIS BANDED SIGNALLING
Feature set	MAINTENANCE AND TESTING
Feature	CCIS - BASIC MAINTENANCE
Feature no	F3154

FEATURE DESCRIPTION

OVERVIEW This feature describes the Common Channel Interoffice Signalling (CCIS) Subsystem MMI level. A detailed description of the CCIS signalling system is contained in the common channel interoffice system requirements technical advisory No. 14 by AT&T.

The CCIS system is a common channel signalling system which consists of dedicating a number of data channels as required between any two offices to carry signalling information for all trunks connected between them. By separating speech and signalling, a fewer number of circuits are tied up performing signalling functions and more efficient use is made of the transmission facilities.

Reliability in the signalling network is ensured by providing duplicated signalling links (A-links) connecting to the two mate Signalling Transfer Point (STP)s. Each signalling link consists of two independent transmission facilities (Voice Frequency Links - VFLs) to a destination, but in normal operation, the signalling terminal is only connected to the active VFL.

Maintenance routines provided by link management are accessible to the user via the Man-Machine Interface at the Maintenance and Administration Position (MAP). The menu commands and status displays are accessed through the CCS maintenance subsystem, it provides commands for telco personnel to test and maintain the hardware equipments in the signalling link system.

The new MAP display for the Common Channel Signalling (CCS) subsystem status display and the menu commands have been added to the existing maintenance administration positions (MAP) VDU. This is the base CCS maintenance MA level, through which all specific CCS systems can be accessed, with the maintenance commands.

TEST CALL DESCRIPTION

CCIS allows an Initial Address Message (IAM) which contains a Calling Party Category of test_call (hereafter referred to as a test call IAM). A test call IAM is used to initiate a standard test call on a particular trunk. A test call IAM must be treated in the following way:

- 1) The call must be allowed to complete even if the continuity check fails.

2) The test call must be completed with a clear-forward and release-guard sequence.

3) Test calls must be accepted on out-of-service trunks.

4) Test calls are differentiated by a one hexadecimal digit address field assigned as follows :

```

0000 continuity check
0001 spare
0010 spare
0011 spare
0100 spare
0101 switching maintenance center communication trunk
      (code 958)
0110 noise and balance termination (code 100)
01113 testboard communication trunk (code 101)
1000 milliwatt 1000 Hz with timed disconnect (code 102)
1001 spare
1010 far-end transmission measurement and noise checking
      (code 104)
1011 ATMS - type test termination (code 105)
1100 spare
1101 PAR test termination (code 107)
1110 echo suppressor test termination
1111 spare

```

³ The binary coded decimal code 0111 may be followed by two binary coded decimal indicating the identity of the test position or group of test positions to which the test call should be directed.

A test call with a digit count greater than 3 is routed using standard translation.

5) Once a test call setup is completed, the only telephone messages expected are the Clear Forward and Release Guard messages used to take the test call down. Neither end should generate any call setup messages for a trunk in a stable test call state.

DMS Implementation of the Requirements

a) Originating End

DMS will generate a test call IAM only for those test calls which are initiated from the Trunk Test Position (TTP) using the following TST commands :

```

TST  | TCON |
     | T100 |
     | S100 |
     | N100 |
     | T102 |
     | T104 |
     | T105 |
     | -   |
     | -   |

```

or the following OP commands :

```

      OP  | T100 |
          | S100 |
          | N100 |
          | T101 |
          | T102 |
          | T104 |
          | T105 |
          | -   |
          | -   |
  
```

or OP number.

(TCON is a new test_line_code that will be used to initiate a continuity test of the trunk.)

Test call IAM's will also be generated when Automatic Trunk Testing (ATT) performs T100, T102, or T104 tests.

Test calls will be completed even if the continuity check fails.

b) Terminating End

When a test call IAM is received for a trunk, the trunk will be connected to the appropriate test card if the trunk is in one of the following DMS states (NTP 297-1001-516N): IDL, INI, MB, NMB, RES, RMB, SB. The call will not be completed if the trunk is one of the following states : CFL, CPB, CPD, DEL, INB, LO, NEQ, PMB, SZD.

When a non-test call IAM containing the digits of a test call code (eg. 100) is received, the trunk will be connected to the appropriate test card. However, these calls will not be completed if the trunk is in a state other than IDL, INI, or RES (i.e. the call will be treated as a normal call). CCIS TRUNK GROUP TABLE CONTROL.

CCIS is a signalling method and as such it is a Trunk Subgroup attribute (in the DMS system). When Subgroup data (table TRKSGRP) is added for an Intertoll Group, the incoming or outgoing pulsetype (MF, DP, NP, DT, C6) determines the signalling method for all the members of that particular Subgroup. A pulsetype of C6 specifies that the trunks in this Subgroup are to use CCIS #6 method of signalling. Subsequently, information about each of these trunks is added in table TRKMEM.

Presently, each entry in table TRKMEM contains information such as the Subgroup to which the member belongs to and its PM location. This information is accessed using the CLLI and external trunk number. At this point it is desirable to associate every individual trunk with the channel which will be used to send and receive messages for that trunk over the CCIS Network. The addressing scheme for these messages is predefined as Layer#, Band# and Circuit#, also known as the Signalling Network Identifier (SNID). There are a maximum of 30 Layers over which every of-

office can signal. Each Layer can contain a maximum of 512 Bands. Each Band can contain a maximum of 16 Circuits. There must exist a one to one correspondence between each CCIS trunk in an office and one of the 16 Circuits (signalling channel slots) in a Band of a given Layer in the CCIS Network.

This is achieved by creating a parallel table to the TRKMEM table. This table will be called 'C6TRKMEM'. The entries in this table are to be accessed as in table TRKMEM by CLLI and external trunk number. The fields stored are Layer# (0-29), Band# (0-511) and Circuit# (0-15). Provisions will be made within the Table Control software to avoid data inconsistencies. One of these is to inhibit the user from deleting a CCIS trunk from TRKMEM unless the corresponding entry has already been deleted from C6TRKMEM.

Package	NTX206AA01 UNAUTHORIZED DIGITONE SERVICE DETECTION
Feature set	ADMINISTRATION
Feature	UNAUTHORIZED DIGITONE SERVICE DETECTION
Feature no	F2482

FUNCTIONAL DESCRIPTION

Telephone calls may originate from either a rotary dial station or a digitone station. When a rotary dial station goes 'off hook' and a telephone number is dialled, the called number is identified by series of pulses collected at a line circuit card. Each string of pulses identifies a different dialled digit. For a call originating on a digitone station a service circuit, digitone receiver, is allocated to the calling subscriber, and is responsible for collecting the received tones, analysing and storing them as digits.

The basic service provided by a telephone company (telco) allows a subscriber to originate calls from a rotary dial station. These users are classified as DP by the telco. Those subscribers using the optional digitone stations are classified as DT.

This feature provides the 'unauthorised digitone detection service'. It is intended as a cutover assistance tool.

The unauthorised digitone detection service is controlled from the man machine interface. A directory of commands is available for use. Available commands allow the telco to

- a) enter the dtdetect level of the map.
- b) turn on the digitone detection service.
- c) clear the list of directory numbers.
- d) turn off the digitone detection service.
- e) exit from the dtdetect level off the map.

Once the service has been started digitone receivers will be allocated to all calls originating from dp classed subscribers. If a digitone receiver is not available immediately then the digits will be collected by the line card. The dp caller will not be prevented from making his call. The telco should ensure that additional digitone receivers are installed for the duration of this feature. Some real time degradation in service is to be expected. This will be due to

- a) a check on receiver availability before a decision can be made on the digit collection mode for the dp subscriber.
- b) time delay for receivers if there are not enough available to handle the extra workload.

If the digitone receiver was used for digit collection then a 'record of users' is updated. This record is available to the telco as an 'OMREPORT'. The report is accessed using the existing omreport facility. It can be scheduled or an immediate print may be requested.

This report is only available while the service is in use. All requests for reports must be made before the 'stop' command has been used, from the dtdetect level, to turn the feature off. The 'record of users' is erased once the service has been stopped.

The user does not have to be in the dtdetect level to request a report.

The 'record of users' will only not keep track of 'how many times' a particular subscriber used digitone receivers for digit collection. It will indicate that the subscriber used a digitone receiver at least once during the life of this feature.

A RESET option has been provided for an immediate clear the 'record of users'.

If the telco wish to keep track of consistent dp users they may do so by setting the 'CLEAR' data field prompt in table OMREPORT. This deletes the directory number from the 'record of users' list after each report. Thus, each report will contain the directory numbers of dp classed subscribers who used the digitone receivers for digit collection since the last report.

The report is formatted as follows.

- a) list of directory numbers of the aforementioned users.
- b) list will be sorted by office code.

For callers from multi-party lines all telephone numbers on the party line will be reported, if all phones are classed as dp. If even one phone is dt then the numbers will not be reported.

Protection will be provided for the following.

- a) Only one user will be allowed to access the dtdetect level of the map.
- b) Allow the user to enter the detect level after a "HX".
- c) Prevent unloading of any feature related module while the service is in use.
- d) The service will continue to function through system restarts cold and warm. For a system restart ipl or

reload the service will be stopped and all data is lost.

NTX207AA01 Status: RTM LCDR ENHANCED

NUMBER IDENTIFICATION/CHARGING :
LCDR ON 2/4 PARTY LINES

F2487

Package NTX207AA01 LCDR ENHANCED
 Feature set NUMBER IDENTIFICATION/CHARGING
 Feature LCDR ON 2/4 PARTY LINES
 Feature no F2487

FEATURE DESCRIPTION

This feature allows the use of the Local Call Data Recording (LCDR) option on 2 and 4 party lines. When installed on a line, the option results in a log output when a local call is made. The record has the the following format:

```
AMAB101 date time seqnbr INFO LAMA_CALL_DATA
ee ii xy calling_nbr called_nbr d day hh mm ss duration
ORIG = len                   TERM = clii +cktnbr       ANS = ans
```

The record contains the following information necessary for billing the call, with the above entries defined as follows:

ee For DMS-100 and DMS-200 codes 00-99 are modifiable by the Telco. The following is a sample of the codes that can be used, and their meanings.

```
00 = station paid DDD, SWAP, InWats
08 = TWX
11 = OutWats
16 = Timed Mesage Rate
```

ii Information digits. Values are:

	BCD digit	0	1	2	3	4	5	6	7
digit 1 :	service analyzed	n	y	n	y	n	y	n	y
	charge	n	n	y	y	n	n	y	y
	traffic sampled	n	n	n	n	y	y	y	y
digit 2 :	ani fail	n	y	n	y	n	y	n	y
	operator dialled	n	n	y	y	n	n	y	y
	operator identified	n	n	n	n	y	y	y	y

The definition of a Y (yes) flag for the above events is as follows:

Service Analyzed? The call was selected by the switch for Service Analysis. It is not an indication of the service observed identifier forming part of an ANI spill.

Charge? Call originated on a chargeable route. An N (no) would appear if the call was on a Charge Adjust or HOT list match (numbers appear in Table HOTLIST).

Traffic Sampled? Call is being Traffic Sampled by the switch. The rate of sampling is defined by the Telco in Table TRAFSAMP. The flag is set if the call is Traffic Sampled and routed to the operator position.

ANI Fail? The ANI spill was not available from the local office. The ANI fail could come as part of the ANI spill or by the Toll office receiving mutilated digits from the connected end connected end office.

Operator Dialed? The forward connection was established by the operator e.g. KP FWD +digits + ST or RLS FWD + ST. This flag is not reversible after the operation of the START key.

Operator Identified? Call originated as ONI either as an inter-toll origination or from an incoming trunk marked ONI.

xy Service Feature code. Calling party = x
Called party = y. Values are:

0 = Default
1 = Coin
2 = Hotel/Motel
3 = Picturephone
4 = Dataphone 50
5 = 3-way (add-on) service
6 = Conference call
7 = Call forwarding

d Event information digit. Values are:

BCD digit = 0 1 2 3 4 5 6 7 8

Answer y y n n y y n n n

Calling party disconnect	y n y n y n y n y
Called party disconnect	n y n y n y n y n
Blue box fraud	n n n n y y y y n
Blocked	n n n n n n n n y

Each value of the Event Information Digit represents a given combination of events. For example a value of 1 implies:

- answer timing was successful (answer = y).
- called party disconnect timing was successful (called party disconnect =y), this indicates that the called party disconnected before the calling party.
- call was not blocked (blocked = n).
- use of fraudulent device was not detected (blue box fraud = n).

day Day of year.

hh mm ss Answer time.

duration For answered calls, this is the Conversation Time in seconds.
For unanswered calls, this variable will have the value of the total time in seconds that the incoming trunk was seized (CAMA billing), or the outgoing trunk was seized.

ORIG Origination point of the call.

TERM Termination point of the call.

ANS Called party answer. Values are:
Y = yes,
N = no.

The tape record contains the information in the middle line of the log report in binary form.

The feature can be added or deleted from a line using Service Order. It is identified by the letters 'CDR' in service order, and should be treated as any other option for the purposes of adding or deleting.

The second half of this feature, is the optional second ANI test. This option can be invoked by setting the variable LCDR_SEC_ANI_TEST in Table OFCENG to Y. The consequence of this action is that a second ANI test will be performed after dialing is complete, in the case of local calls. If, however, LCDR_SEC_ANI_TEST is given a value of N, this second test will only be performed in the case of toll calls.

NTX208AA02 Status: RTM AUTOMATIC COIN TOLL SERVICE (ACTS)

COIN HANDLING	:	
AUTOMATIC COIN TOLL SERVICE (ACTS)		F2489
AUTOMATIC COIN TOLL SERVICE PHASE I		F3968
ACTS - STANDARD PROM ANNOUNCEMENTS		F5422

Package	NTX208AA02 AUTOMATIC COIN TOLL SERVICE (ACTS)
Feature set	COIN HANDLING
Feature	AUTOMATIC COIN TOLL SERVICE (ACTS)
Feature no	F2489

FEATURE SYNOPSIS

This feature provides the operator access to the use of the coin detection circuit and gives information on operator screen of the amount collected.

FEATURE DESCRIPTION

When this feature is introduced, operator recall by hook flash will bring the call back to the operator with the coin detection circuit (CDC) still attached.

On partial deposits, the amount still due will be displayed and updated with each coin deposit and the field is updated on each coin return action by the operator.

The operator display is therefore enhanced with an over collect field located at row 12 column 2.

ACTS (flashing) corresponds to CDC not connected;
ACTS (steady) corresponds to CDC connected; and
ACTS (non-display) means the phone is not compatible with ACTS.

Operators also have the capability to override the CDC functions on suspected frauds/trouble/circuit malfunctions etc.

This feature also reduces the keying sequences for part-charge calls.

The following features are required for this feature to function properly
- F3968 and F3461.

Package	NTX208AA02 AUTOMATIC COIN TOLL SERVICE (ACTS)
Feature set	COIN HANDLING
Feature	AUTOMATIC COIN TOLL SERVICE PHASE I
Feature no	F3968

FEATURE SYNOPSIS

A Phase I of ACTS(Automatic Coin Toll Service)will consist of coin supervision and customized announcements. Maintenance for the tone receiver card will be included. Live operator assistance will be covered under BR0489(Phase II).

FEATURE DESCRIPTION

This feature provides Automatic Coin Toll Service (ACTS). ACTS is being developed in order to reduce operator handling of calls. ACTS is primarily designed to reduce operator involvement in the handling of station paid coin calls. ACTS can handle the initial contact on most station paid coin calls as well as the charge due contacts. ACTS can also handle notification on all coin calls as well as notifications for non-coin calls. Finally, ACTS can be used for the quotation on most time and charges for non-coin calls.

Reference: FDOC BC1377

Package	NTX208AA02 AUTOMATIC COIN TOLL SERVICE (ACTS)
Feature set	COIN HANDLING
Feature	ACTS - STANDARD PROM ANNOUNCEMENTS
Feature no	F5422

FEATURE SYNOPSIS

This feature implements the announcements in the DRAM for automatic coin toll service.

FEATURE DESCRIPTION

This feature introduces the NT1X76AE circuit pack to be provisioned by customer engineering on a standard DRAM shelf. It may be used on all versions of DRAM although the software restricts its use to a shelf, containing a NT1X75BA enhanced DRA controller pack.

The ACTS standard PROM announcement circuit pack provides speech recordings in a permanent form to be used on a DRA shelf.

Reference - BF0692, NTP 297-1001-527

³This is a hardware feature

NTX209AA03 Status: RTM FEATURE GRP B AMA - END OFFICE (ATT FORM

NUMBER IDENTIFICATION/CHARGING :

ACCESS CHARGE RECORDING - END OFFICE (ATT FORMAT)	F2494
FGB - AMA ENHANCEMENTS	F5491
FGB-AMA ENHANCEMENTS II	F5742

Package	NTX209AA03 FEATURE GRP B AMA - END OFFICE (ATT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ACCESS CHARGE RECORDING - END OFFICE (ATT FORMAT)
Feature no	F2494

FUNCTIONAL DESCRIPTION

1.0 Introduction

ENFIA (Exchange Network For Interstate Access) is an alternate plan to provide OCCs (Other Common Carriers) access for the origination and termination of calls to the BOC's (Bell Operating Companies) network. Under ENFIA B and C a patron would access the OCC switch by dialing 950-10XX, where XX identifies the particular OCC. For ENFIA A any seven digit code may correspond to the OCC. Having accessed the OCC switch the patron would then receive dial tone from the OCC and dial a PIN (Personal Identification Number) code (optionally) followed by the number he/she wishes to reach using the standard dial plan. Unless dial pulse repeating is provided the patron must have a DTMF phone so that the tones may be passed through the BOC network to the OCC switch.

The function of the BOC switch is to route the originator of an ENFIA call to the OCC switch and make the appropriate records in order to be able to bill the OCC for the use of BOC facilities. On the terminating side the call will be received from an OCC and routed to the destination with records being kept for billing as mentioned above.

ENFIA A - connection of the BOC to an OCC via a line or a hunt group to correspond to any NXX-XXXX number.

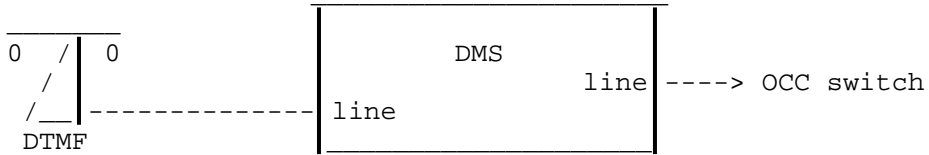
ENFIA B - connection to an OCC via a trunk group from a local end office. (950-10XX dialed)

ENFIA C - connection to an OCC via a trunk group from a tandem office. (950-10XX dialed)

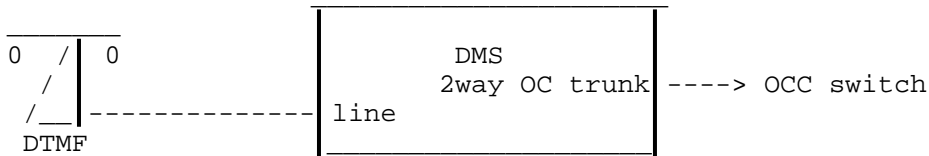
See figure 1 on the next page.

FIGURE 1

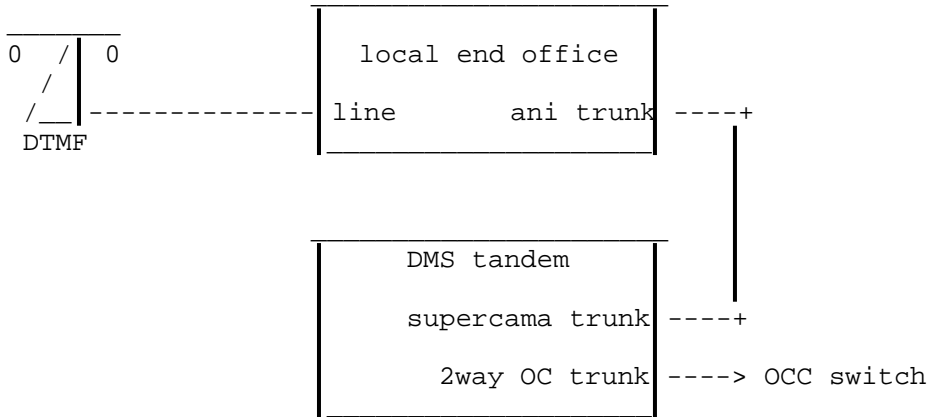
ENFIA A



ENFIA B



ENFIA C



2.0 ENFIA B

ENFIA B calls can be supported in DMS offices using the current translation scheme. The pretranslation table could be set up to route the 950-10XX calls to the designated trunk groups by CLLI. The call type for these calls should be set to DD in the translations. Overflow calls (when the OCC trunk is unavailable) should be routed to a tandem office via regular outgoing CAMA trunks or given reorder treatment. Calls routed to a tandem will be recorded under ENFIA C AMA recording. The AMA records required for such calls are not currently available. The AT&T FSD (Feature Specification Document) no. 20-24-0000 describes in detail the AMA records required for interexchange carrier interconnection. Since ENFIA is an alternate plan to support access to OCCs the same record types apply. For ENFIA B two call types will be recorded (110 and 119 in FSD 20-24-0000).

The origination of an ENFIA call will be recorded using an 'Interexchange Station Paid' type of record where aside from normal AT&T AMA record information the carrier connect time as well as carrier identification will be recorded. The fields of the record corresponding to the terminating NPA and number will be zeros since the number dialed directly into the OCC switch cannot be saved. Because the impact to the network is supposed to be minimal an enhancement to an existing trunk type will be made in order to handle ENFIA traffic. The ENFIA AMA record will be generated based on the outgoing trunk type used. The reason for this is that information such as the carrier connect time is only available at the office immediately next to the OCC and hence the AMA record must be made at that point. One cannot determine whether one is at the office next to the OCC until an outgoing trunk group (of the type which goes to an OCC) is seized.

The termination of an ENFIA call will be recorded using a 'Access Termination Record' which will contain similar information to the previously mentioned record except that the terminating number and NPA will now be available. No origination number is required in this case, only the incoming trunk number. Here again the generation of AMA records will be based on the trunk type used since the digits received from the OCC contain no information to identify the call as an ENFIA call.

3.0 Implementation Description

3.1 Trunk Modifications

In order to be able to generate the required AMA records an existing trunk type must be modified to handle the OCC calls. For ENFIA B (from a class five office, DMS-100) the trunk type would correspond to a two-way CAMA trunk (OC trunks). This trunk would be differentiated from an ordinary OC trunk by a bool in the trunk group data specifying that this trunk is to be used to provide access to an OCC. The bool to be added will be called OCCTRAFC. The signalling to be used from the BOC to the OCC is supposed to be standard Bell CAMA format, hence the two-way CAMA trunk would provide the OCC with the ANI required in the expected format. The

OCC may optionally elect not to receive an ANI spill in which case either no ANI request will be received or simply KP+ST will be outpulsed. The ANI request type field in the trunk group data will be modified to accept NO as well as WNK and REV. The use of NO in this field means that no ANI request will be recognized from the OCC. A second bool in the two-way OC trunk group data called OCCANI will be used to differentiate normal ANI spill from KP+ST. When set to N OCCANI will provide KT+ST otherwise a normal ANI spill will result. On the incoming side this trunk would be treated as a regular trunk (terminating in a class five).

3.2 AT&T AMA Records

The AMA records to be used are for call codes 110 and 119 in FSD 20-24-0000. The recording of ENFIA B and C calls will be controlled by a bool in table AMAOPTS called RECORD_ENFIA_CALLS. The following information is required for the two call types. Long duration calls will also contain 'Present Date' and 'Present Time' for both types.

<u>110 Interexchange Station Paid</u>	<u>119 Terminating Access Record</u>
Call Type	Call Type
Sensor Type	Sensor Type
Sensor Identification	Sensor Identification
Recording Office Type	Recording Office Type
Recording Office Identification	Recording Office Identification
Date of Answer	Date of Answer
Timing Indicator	Timing Indicator
Study Indicator	Study Indicator
Answer Indicator	Answer Indicator
Service Observed, Traffic Sampled	Service Observed, Traffic Sampled
Operator Action	Operator Action
Service Feature	Service Feature
Originating NPA	
Originating Number	
Overseas Indicator	Overseas Indicator
Terminating NPA	Terminating NPA
Terminating Number	Terminating Number
Answer Time	Answer Time
Elapsed Time	Elapsed Time
3 IEC/INC Prefix	3 IEC/INC Prefix
3 Carrier Connect Date	3 Carrier Connect Date
3 Carrier Connect Time	3 Carrier Connect Time
3 Elapsed Time from Carrier Connect	3 Elapsed Time from Carrier Connect
3 IEC/INC Event Status	3 IEC/INC Event Status
3 Trunk Group Number	3 Trunk Group Number
3 Routing Indicator	3 Routing Indicator
3 Dialing Indicator	
3 ANI Indicator	

The fields with an asterisk next to them are the ones which will be new for ENFIA. For an explanation of the other fields please see the LSSGR Section 8.0 (these are currently supported in DMS AT&T AMA records).

IEC/INC Prefix

This is a three character table containing the prefix corresponding to the OCC used in the call (XX is the prefix in 950-10XX) and a single character to show if the prefix is valid. The prefix will be taken from the called digits on the outgoing side of ENFIA B and ENFIA C calls. For terminating access records this field will be 002 for ENFIA calls indicating that the XX could not be found (2 means prefix unavailable).

Carrier Connect Date

This will be the date at which the first (send digits) wink is received after trunk seizure on the trunk connecting the BOC to the OCC. The date and time for carrier connect will be derived from the time returned by the peripheral in either the disconnect or answer message.

Carrier Connect Time

This is the time of the above mentioned wink.

Elapsed Time from Carrier Connect

The time from carrier connect to the time of disconnect.

IEC/INC Call Event Status

This code will be used to record the last event to occur within the call before disconnect. For ENFIA calls the existing recording scheme will only be able to keep track of trunk seizure, answer and disconnect.

Routing Indicator

This code will be used to indicate whether the call passed through a tandem office (as in ENFIA C).

Trunk Group Number

This code will be used to identify the trunk group used to connect to the OCC. For terminating records this field will be used to identify the OCC in question.

Dialing Indicator

This code will indicate that the dialed digits were 950-10XX.

ANI Indicator

This is a boolean field used to show if ANI was provided to the OCC.

3.3 Interactions and Special Cases

When a patron dial an OCC via ENFIA B or C from a coin phone he will need to use his PIN code. The ANI spill for such calls will be KT+1+ST (ONI) indicating that this call requires identification (assuming the ANI request type is either REV or WNK and OCCANI is set to Y). The coin will be returned from the coin phone on ENFIA calls.

For hotel/motel lines the ANI spill will be the same as for coin phones described above.

For lines which are message rate or have LCDR only the ENFIA AMA record will be produced. These lines will be treated as if they are making a regular DD long distance call and the local recording of these will be inhibited.

It is recommended that the ANI request type used on OCC trunks be wink because a reversal will be interpreted as answer and true answer will not be seen. Carrier connect time which is what the BOCs will bill the OCCs for (on 110 type calls) will not be affected by the ANI request type.

For unanswered calls 110 records will be turned on by the UNANS_LOCAL parm in table AMAOPTS. For unanswered 119 calls the UNANS_TOLL parm will need to be turned on. Both will require that the call code be included in table ATTCODES.

To summarize, on ENFIA calls an AT&T AMA record will be made at the BOC offices next to the OCC switches where the call leaves and enters the BOC network. The trunks used for this traffic will be two-way OC trunks. The AMA records generated will be based on the trunk type used rather than on the digits dialed.

Package	NTX209AA03 FEATURE GRP B AMA - END OFFICE (ATT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	FGB - AMA ENHANCEMENTS
Feature no	F5491

FEATURE GROUP B AMA ENHANCEMENTS (F5491/BC1680)FEATURE SYNOPSIS

This feature provides non-zero data for the IC_INC_PREFIX field in Automatic Message Accounting (AMA) records for Feature Group B (FGB) terminating access records.

As well, it provides accurate data in the OVERSEAS_INDICATOR field of the AMA record in Feature Group B terminating access records. This field signifies whether or not the Numbering Plan Area (NPA) was dialed by the customer on non-international calls.

In conjunction with this feature, an extra check will be put into the table control for table TRKNAME to prevent the error of entering a duplicate Common Language Location Identifier (CLLI) into the table.

FEATURE DESCRIPTION

This feature provides two new capabilities for FGB billing records. The first is the ability to derive the IC_INC_PREFIX by retrieving the carrier name from the trunk group data for Centralized Automatic Message Accounting (CAMA) trunk groups. This is accomplished by the addition of a new carrier name field for two-way Outgoing CAMA (OC) trunk groups, called CARRNM, which contains the identity of the carrier using that trunk group. It is an optional field which only appears if the existing Other Common Carrier Traffic Class - OCCTRAFC field is set to 'Y', meaning that this trunk group handles FGB traffic. Also, the existing OCCANI field which signifies OCC Automatic Number Identification field, will only appear if the OCCTRAFC field is set to 'Y'.

The second enhancement provides an accurate indication of whether or not the NPA was dialed by the customer on non-overseas calls. A '0' in this field indicates the NPA was explicitly dialed, while a '1' signifies that the NPA was derived internally. This information is stored in the OVERSEAS_INDICATOR field of the AMA records.

Finally, the table control for table TRKNAME has been modified to accept only one instance of a CLLI name in the table, since there must be a unique identifier for each trunk group in the switch. This is because downstream processing checks the validity of the IC_INC_PREFIX field and the trunk group in the AMA record against the CLLI in table TRKNAME to make sure the correct carrier is being billed. This new check is to alleviate any ambiguities surrounding the identification of a trunk.

Package	NTX209AA03 FEATURE GRP B AMA - END OFFICE (ATT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	FGB-AMA ENHANCEMENTS II
Feature no	F5742

FEATURE SYNOPSIS

This feature allows feature group B (FGB) calls that are routed through a FGB tandem (FGBT) to be billed in the end office. The proper call code 134 billing record is made and automatic number identification (ANI) digits are not spilled to the FGBT.

FEATURE DESCRIPTION

FGB call processing in DMS system was originally designed to use centralized automatic message accounting (CAMA) billing for originating calls using an access tandem. LAMA billing was only supported if the end office had a direct connection to the FGB carrier.

This feature allows the option of LAMA billing for all originating FGB calls. Note that terminating FGB calls using an access tandem must still bill in access tandem.

Ref: FDOC BC2136
FSD 20-24-0300

NTX210AA03 Status: RTM NO. 2 SCC INTERFACE

INTERFACES	:	
NO. 2 SCC INTERFACE		F2495
MAINTENANCE AND TESTING	:	
REMOTE SURVEILLANCE AND CONTROL		F2513
NO.2 SCC CRITICAL INDICATOR ENHANCEMENT		F2693

Package	NTX210AA03 NO. 2 SCC INTERFACE
Feature set	INTERFACES
Feature	NO. 2 SCC INTERFACE
Feature no	F2495

FUNCTIONAL DESCRIPTION

This feature allows the LOG system to output logs in the AT&T switching control centres format. All the existing functions of the LOG system will remain unchanged. Optionality will be specified by an office parm, and formatting selected via datafill.

An office parm 'SCC2_LOGS' will be added to the OFCOPT table to indicate the optionality of this feature. The table LOGDEV will be changed to include a new field 'FORMAT' which will accept either 'STD' or 'SCC2'. The STARTDEV command of LOGUTIL will then format reports according to this setting. All output from the LOG system will also conform to this format. For any device which does not have an entry in the LOGDEV table, the format will be defaulted to 'STD'. If format 'SCC2' is required, the device must be added to the LOGDEV table and 'SCC2' entered in the format field.

Also note, the SCANLOG tool requires 'STD' format. It will not work for SCC2 logs. AT&T has their own form of SCANLOG for handling 'SCC2' logs.

For complete compatibility, terminal controller F/W version 1 must be used and the output must go to a VDU type device. (The type of the physical device is of course irrelevant).

Since messages from SOS (such as messages announcing restarts) are handled before the LOG system initializes and we don't want to complicate restarts, the messages from SOS will be changed to be compatible with SCC2 format.

The SCC2 format will be:

line 1 (variable length)

col. 01-02	Priority of Action
	' ' no alarm
	'3 ' minor alarm
	'33 ' major alarm
	'3C' critical alarm
col. 03-04	Minutes after the hour
col. 05	blank
col. 06-09	Log name left justified
col. 10-12	report number with leading zeros

col. 13 '+' if thresholded, blank otherwise
col. 14-15 global sequence number with leading zeros
col. 16-17 device sequence number with leading zeros
col. 18 blank
col. 19-132 eventtype of report, event, optional euqipment id
and other report specific information.

other lines (variable length):

col. 01-132 any report specific information.

Last line (fixed length):

col. 01 LF (Line Feed)

col. 02 EM (End of Message, octal 31, hex 19)

Office ID will not be output for SCC2 format. This will have no affect on the office ID for STD format.

The time and date of the report has been omitted at the request of AT&T. Therefore, there will be no way of finding out the actual time of the report. The SCC can only timestamp the reports as they are printed. This may be up to ten minutes or more later.

The treatment of end-of-line characters will depend on the version of terminal controller F/W used. In version 0 (also known as 'old'), each line will be preceeded by LF and followed by CR and nulls. This means the entire report is preceeded by LF and followed by CR with LF, CR and nulls between each line. The last characters of the report will be CR, nulls, LF, EM, CR, nulls.

If version 1 (also known as 'new') terminal controller F/W is used, each line is preceeded by CR, LF and nulls. The last characters of the report will be CR, LF, nulls, LF and EM. The number of nulls is an attribute of the console type (any VDU type will have zero nulls).

Package	NTX210AA03 NO. 2 SCC INTERFACE
Feature set	MAINTENANCE AND TESTING
Feature	REMOTE SURVEILLANCE AND CONTROL
Feature no	F2513

FEATURE DESCRIPTION

The purpose of this feature is to provide central control maintenance support for the remote maintenance and control hardware. This hardware will be provided as part of the NT1X48CA card on the CPU when an office is to use this feature.

The new hardware consists of a microprocessor, some registers and relays, and a serial interface. Its purpose is to provide remote access to the face plate controls found on the NT1X48CA card (DACT, reset and thumbwheel) and to provide monitoring of both the alarms and NT1X48CA card status lights (offline, hex and activity).

The micro processor runs its own set of diagnostics on a routine basis (every 300 milliseconds). Failing the self-test results in the setting of the RMC (Remote Maintenance and Control) sanity failure flag. When this is set, the RMC hardware has no control on that particular NT1X48CA card. This feature will provide a means by which to manually set and clear this bit (equivalent to disabling and enabling the unit respectively).

A second status flag, called the protocol failure flag, will be set if the communication protocol to the RMC is violated. This does not cause the unit to shut down, but it is a valid error condition. No provision will be made to "manually" set this flag by either the hardware or software. Enabling the unit will result in the clearing of the protocol failure, but only via the software.

The central control maintenance software is also required to monitor and report each status. This will be done during a routine audit (approximately once every ten minutes) and will produce logs and map updates accordingly.

Errors which do occur on the RMC unit will be reported as a CC fault, but do not hinder the ability of the CC to run in sync.

Package	NTX210AA03 NO. 2 SCC INTERFACE
Feature set	MAINTENANCE AND TESTING
Feature	NO.2 SCC CRITICAL INDICATOR ENHANCEMENT
Feature no	F2693

FEATURE SYNOPSIS

This feature provides the following alarm indicators to the DMS-100 Family to Switching Control Center System (SCCS) Interface through the E2A telemetry:

- circuit limit
- central control
- central message controller
- switching network
- peripheral
- input/output.

FEATURE DESCRIPTION

The DMS-100 Family to Switching Control Center System Interface allows the DMS-100 Family to interact with the No. 2 Switching Control Center System used in Switching Control Centers in the Bell System.

The DMS to SCCS Interface consists of two main components: the Input/Output Interface, and the Telemetry Interface. The I/O Interface is comprised of a Maintenance and Administration Position (MAP) channel, and a Logging channel. The Telemetry Interface consists of a Serial Data Interface, and a Discrete Contact Closure Interface.

This feature adds alarm indicators to the Discrete Contact Closure Interface so the Critical Indicator Panel of the SCCS will immediately indicate the source of trouble in the DMS.

Ref: FDOC BR0693

NTX211AA02 Status: RTM FEATURE GRP B AMA - TANDEM (ATT FORMAT)

NUMBER IDENTIFICATION/CHARGING :

ACCESS CHARGE RECORDING - TANDEM (ATT FORMAT)

F2496

FGB - AMA ENHANCEMENTS

F5491

Package	NTX211AA02 FEATURE GRP B AMA - TANDEM (ATT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ACCESS CHARGE RECORDING - TANDEM (ATT FORMAT)
Feature no	F2496

FUNCTIONAL DESCRIPTION

1.0 Introduction

ENFIA (Exchange Network For Interstate Access) is an alternate plan to provide OCCs (Other Common Carriers) access for the origination and termination of calls to the BOC's (Bell Operating Companies) network. Under ENFIA B and C a patron would access the OCC switch by dialing 950-10XX, where XX identifies the particular OCC. For ENFIA A any seven digit code may correspond to the OCC. Having accessed the OCC switch the patron would then receive dial tone from the OCC and dial a PIN (Personal Identification Number) code (optionally) followed by the number he/she wishes to reach using the standard dial plan. Unless dial pulse repeating is provided the patron must have a DTMF phone so that the tones may be passed through the BOC network to the OCC switch.

The function of the BOC switch is to route the originator of an ENFIA call to the OCC switch and make the appropriate records in order to be able to bill the OCC for the use of BOC facilities. On the terminating side the call will be received from an OCC and routed to the destination with records being kept for billing as mentioned above.

ENFIA A - connection of the BOC to an OCC via a line or a hunt group to correspond to any NXX-XXXX number.

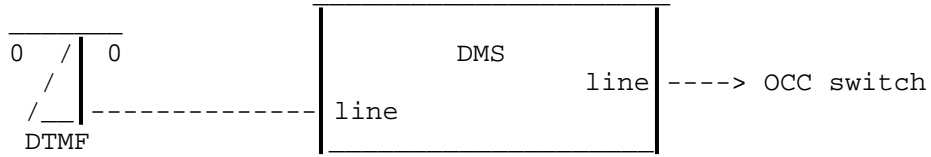
ENFIA B - connection to an OCC via a trunk group from a local end office. (950-10XX dialed)

ENFIA C - connection to an OCC via a trunk group from a tandem office. (950-10XX dialed)

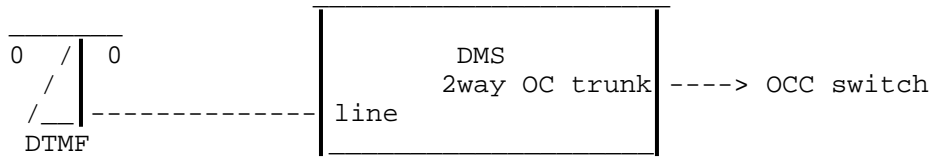
See figure 1 on the next page.

FIGURE 1

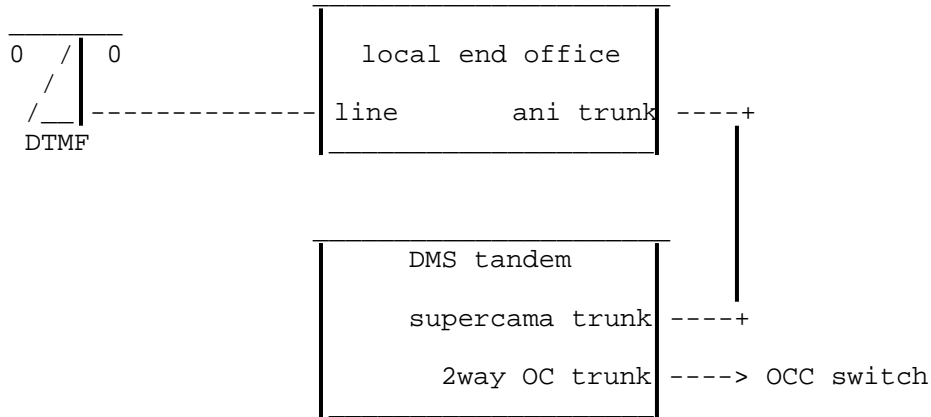
ENFIA A



ENFIA B



ENFIA C



2.0 ENFIA C

ENFIA C involves the routing and billing of ENFIA type calls through a tandem office to an OCC switch. Simple modifications in the pretranslation table will enable such calls to be made through a DMS tandem. The AMA record formats required for these calls are defined in the AT&T FSD 20-24-0000. There are two types of calls to be handled at a tandem office. For reasons discussed in the DID for R0494 (ENFIA B AMA Recording) the records will be generated based on the outgoing and incoming trunk type. A new trunk type will be created to handle ENFIA traffic. ENFIA calls which must go from the tandem to the OCC will be recorded using an 'Interexchange Station Paid' (call code 110 in FSD 20-24-0000) record. The second type of call is an incoming call from an OCC to a tandem which will be recorded using a 'Terminating Access Record' (call code 119 in FSD 20-24-0000).

3.0 Implementation Description

ENFIA C will be implemented nearly identically to ENFIA B except in a tandem switch for trunk to trunk calls.

3.1 Trunk Modifications

As with ENFIA B two way OC trunks will be used to provide access to and from the OCC. The use of OC trunks in a tandem office will be new for ENFIA C but will provide the ANI in the expected format to the OCC. See R0494 for further details regarding ENFIA OC trunk group modifications. For outgoing ENFIA traffic the calls must be received on a supercama trunk from the end office. This will ensure that the end office used a normal cama trunk and hence will not have billed the call. The supercama trunk will provide the ANI information to be regenerated to the OCC on the two way OC trunk. For incoming traffic the OC trunk will behave exactly as in ENFIA B and routing to an end office may be made via any trunk (no special requirement). In other words terminating ENFIA C calls need not use two-way supercama trunks unless regular toll completing trunks are unavailable.

3.4 Unanswered Calls

Unanswered calls will be treated the same as other toll unanswered calls. Namely that the UNANS_TOLL parms in table AMAOPTS will turn on both outgoing and incoming (110 & 119) call recording (with the call codes in table ATTCODES).

3.3 AT&T AMA Records

The records for ENFIA C will be identical to those of ENFIA B (see R0494).

To summarize, on ENFIA calls an AT&T AMA record will be made at the BOC offices next to the OCC switches where the call leaves and enters the BOC

network. The new trunk type used for ENFIA will be used as the criterion for creating the AMA records rather than the digits received. In a tandem office the outgoing traffic will arrive on supercama trunks and leave on two way OC trunks designated for OCC traffic.

Package	NTX211AA02 FEATURE GRP B AMA - TANDEM (ATT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	FGB - AMA ENHANCEMENTS
Feature no	F5491

FEATURE GROUP B AMA ENHANCEMENTS (F5491/BC1680)

FEATURE SYNOPSIS

This feature provides non-zero data for the IC_INC_PREFIX field in Automatic Message Accounting (AMA) records for Feature Group B (FGB) terminating access records.

As well, it provides accurate data in the OVERSEAS_INDICATOR field of the AMA record in Feature Group B terminating access records. This field signifies whether or not the Numbering Plan Area (NPA) was dialed by the customer on non-international calls.

In conjunction with this feature, an extra check will be put into the table control for table TRKNAME to prevent the error of entering a duplicate Common Language Location Identifier (CLLI) into the table.

FEATURE DESCRIPTION

This feature provides two new capabilities for FGB billing records. The first is the ability to derive the IC_INC_PREFIX by retrieving the carrier name from the trunk group data for Centralized Automatic Message Accounting (CAMA) trunk groups. This is accomplished by the addition of a new carrier name field for two-way Outgoing CAMA (OC) trunk groups, called CARRNM, which contains the identity of the carrier using that trunk group. It is an optional field which only appears if the existing Other Common Carrier Traffic Class - OCCTRAFC field is set to 'Y', meaning that this trunk group handles FGB traffic. Also, the existing OCCANI field which signifies OCC Automatic Number Identification field, will only appear if the OCCTRAFC field is set to 'Y'.

The second enhancement provides an accurate indication of whether or not the NPA was dialed by the customer on non-overseas calls. A '0' in this field indicates the NPA was explicitly dialed, while a '1' signifies that the NPA was derived internally. This information is stored in the OVERSEAS_INDICATOR field of the AMA records.

Finally, the table control for table TRKNAME has been modified to accept only one instance of a CLLI name in the table, since there must be a unique identifier for each trunk group in the switch. This is because downstream processing checks the validity of the IC_INC_PREFIX field and the trunk group in the AMA record against the CLLI in table TRKNAME to make sure the correct carrier is being billed. This new check is to alleviate any ambiguities surrounding the identification of a trunk.

NTX213AB02 Status: LTD SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF

ADMINISTRATION AND TESTING	:	
DMS-1 LINE TEST VIA LTA		F2695
MAINTENANCE	:	
SCMR DYNAMIC CHANNEL REASSIGNMENT		F2797
CALL PROCESSING	:	
SCM-100R CC CALL PROCESSING		F3300
MAINTENANCE	:	
SCM-100R CC MAINTENANCE		F3302
SCM-100R PP MAINTENANCE		F3303
SCM-100R CC ALARMS		F3304
ADMINISTRATION	:	
SCM-100R OPERATIONAL MEASUREMENTS		F3306
SCM-100R LOGS		F3307
MAINTENANCE	:	
SCM-100R CC PROTECTION SWITCHING FOR SMR		F3308
ADMINISTRATION	:	
SCM-100R ADMINISTRATION		F3309
CALL PROCESSING	:	
SCM - 100R PP CALL PROCESSING		F3310
SCM-100 OPERATOR VERIFICATION		F3478
SCM - 100R 2 PARTY ANI		F3479
SCM - 100R PP COIN FUNCTIONS		F3480
MAINTENANCE	:	
T1 MTCE FOR REMOTE LINKS		F3498
RSB LINE MAINTENANCE		F3723
MAP LINE MAINTENANCE		F3724
PP DIGITAL TEST HEAD		F3911
SCM-100R PP PROTECTION SWITCHING		F3912
ADMINISTRATION	:	
SCM100R - OM AND DTSR SUPPORT FOR SMR		F5455
MAINTENANCE	:	
SCM100R - SMR PM MAINTENANCE - PHASE II		F5456
SCM100R - SMR OVERLOAD CONTROL		F5458
MAINTENANCE AND TESTING	:	
SCM - PP SMR WARM SWACT		F5533
MAINTENANCE AND TESTIN	:	
LTA ON RCTS (CC)		F5757

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	ADMINISTRATION AND TESTING
Feature	DMS-1 LINE TEST VIA LTA
Feature no	F2695

FEATURE SYNOPSIS

This feature provides peripheral software to operate relays on DMS-1 RCT for LTA (line test access).

FEATURE DESCRIPTION

This feature supports the operation of the LTA and shelf test bypass assembly to provide metallic path connection between the test equipment and either a line card or a line subscriber loop. This facilitates remote concentrator terminal (RCT) line testing by the central control (CC) maintenance software implemented in F5757 "LTA on RCTs (CC)". Also, the detailed processing of the pair gain test controller (PGTC) tests is implemented by this feature.

Ref: FDOC BR0695

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	SCMR DYNAMIC CHANNEL REASSIGNMENT
Feature no	F2797

FEATURE SYNOPSIS

Subscriber carrier module (Rural) dynamic channel reassignment is the process of transferring, within the remote concentrator terminal (RCT) active calls from one digroup to free channels on the other digroup. This feature prevents active calls from being lost when a RCT digroup fails due to either a DS1 link failure or a RCT digroup hardware failure. Active calls are also reassigned when a DS1 link is manually busied.

FEATURE DESCRIPTION

SCMR dynamic channel reassignment is used if a RCT digroup goes out of service. The following is a list of faults or failures that can activate channel reassignment:

1. DS1 loss of frame
2. DS1 (6X50) card removed
3. Bipolar violations reached out-of-service limit
4. RCT QPP417 address controller failure
5. RCT QPP419 digroup failure

A digroup can also go out of service if a DS1 link is manually busied from the MAP. This feature reassigns calls only in the talking or ringing states. A call in any other state is dropped. Protection switching has priority over channel reassignment.

Ref: AF0089 FDOC

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	CALL PROCESSING
Feature	SCM-100R CC CALL PROCESSING
Feature no	F3300

FEATURE SYNOPSIS

This feature provides the additions and changes to the CC symbolic ranges and data structures to support the SCM range of peripherals.

FEATURE DESCRIPTION

The following range definitions are expanded:

PM_TYPE - three new PM types are declared to identify the three SCM-100 variants; SMR, SMS, SMM. In addition, a PM type is declared for the SCM concentrator; RCT.

CARD_CODE - two new cards are declared:

NT6X80 - PAD/RINGING card

NT6X81 - Abit/B Word card

Additionally several line card codes are declared for RCT lines.

XPM_CARD_ID - range expanded to include the two new card codes.

NODE_TYPES - one additional nodetype is declared to support the RCT.

FRAME_NAME - a new symbol is bound into the FRAME_NAME_TYPE_ID for the RCT; RCE.

PEC - the Product Engineering Code for the common peripheral control circuit pack for the LGC/SCM is added to the data dictionary. Two PECs are added as product identifiers for the RCT devices.

LCD_TYPE- a new LCD type is declared for the new SCM-100 line concentration device; RCT_LCD for the DMS-1.

EXEC_LINEUP - one new exec lineup; SCMEX

NODE_LEVELS - the scan peripherals are implemented at PM_NODE_LEVEL (4) and the RCT at REMOTE_PM_NODE_LEVEL(S).

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	SCM-100R CC MAINTENANCE
Feature no	F3302

FEATURE SYNOPSIS

This feature provides the maintenance software required for support of the DMS-1 RCT. The RCT interfaces to the SMR peripheral via DS-1 links and receives control via B-word messaging.

FEATURE DESCRIPTION

CC Maintenance

The SMR monitors the RCT alarm registers each five seconds. A unsolicited message informs the CC RCT maintenance of alarm changes. The alarms supported by the RCT are:

DFA - This alarm register is set when a loss of frame is detected in digroup A circuit pack. Since the RCT digroup loops back the incoming command, any problem in the digroup circuit pack will be reflected at the SMR and SMR maintenance software will take the necessary actions. The maintenance action left to the RCT will be to change the node state to in service trouble with the reason 'DIGROUP A FAILED'. A minor alarm will be generated. When DFA is cleared the RCT will be returned to in service state.

DFB - This alarm register is set when a loss of frame is detected in digroup B circuit pack. The same maintenance action taken on DFA will be taken here.

LFA - This alarm register is set when a signal loss or high bipolar violation rate is detected on line A by repeater A. CC RCT maintenance will change the affected RCT state to in service trouble. A minor alarm will be generated. The in service trouble reason is 'LINE A FAILED'.

LFB - This alarm register is set when a signal loss or high bipolar violation rate is detected on line B by repeater B. The same maintenance action taken on LFA will be taken here.

LFP - This alarm register is set when a signal loss or high bipolar violation rate is detected on protection line by protection line repeater. The RCT state will be changed to in service trouble reason is 'PROTECTION LINE FAILED'.

LPF - This alarm register indicates a failure in a line power converter. Since the alarm does not tell which line power converter failed the only

maintenance action to be taken will be to change the state of the RCT to in service trouble and set a major alarm. The in service trouble reason will be 'LINE DRAWER FAILED'.

RMN - This alarm register is set when one of the ringing generators and/or when one of the 300-V converter fails. CC RCT maintenance will change the state of the RCT to in service trouble and set a minor alarm. The ISTb reason will be 'RINGING GENERATOR MINOR ALARM'.

RMJ - This alarm indicates ground or excessive load on ringing bus, a loss of ringing voltage or synchronization. The affected RCT will be changed to in service trouble state and a major alarm will be generated. The ISTb reason will be 'RINGING GENERATOR MAJOR ALARM.'

CPF - This alarm register indicates a power converter failure. The affected RCT will be changed to in service trouble state and a minor alarm will be generated. The in service trouble reason will be 'RCT POWER CONVERTER FALED'.

PM MAINTENANCE

The SCM peripherals are based on LGC architecture and the same software, modified for use with the SMR, is utilized.

Two new functional components are included for SMR. These exercise the diagnostics for the A/B bit circuit pack (6X81) and the pad/ringing circuit pack (6X80) utilized by the SMR.

For system maintenance a B-word command timeout results in an unsolicited CC message indicating the failed link.

Manual maintenance integrates the SMR into the PM level MAP display. The following commands supported by the LTC are utilized in the SMR maintenance level:

SWACT, BSY, RTS, OFFL, LOADPM, QUERYPM, TRNSL, TEST

Changes to the manual maintenance are:

- p-side link test failure indicates a faulty ds-1 (rather than DS-30A for LGC)
- if a p-side link is busied the user is prompted for confirmation. when the other link is not OK:
- the formatting of the ps node tabledown loaded at LOAD or RTS is formulated for support of RCT nodes.

References

For details of log changes and MMI see FDOC BC0762.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	SCM-100R PP MAINTENANCE
Feature no	F3303

FEATURE SYNOPSIS

This feature provides the diagnostic capability for the A/B bit circuit pack (NT6X81) and the pad/ring circuit pack (NT6X80) used in the SCM 100. The ammendments required to the LGC maintenance software for support of the SCM architecture is also included.

Feature Description

Manual Maintenance

SMR will be integrated into the current PM level MAP display. SMR will be a new level which can be entered by using the command POST from PM level. The following commands, currently supported in LGC, will be supported in SMR maintenance level.

SWACT - switch activity
 BSY - busy module, single unit or p side link
 RTS - return to service module, single unit or p side link
 OFFL - off load module
 LOADPM - load PM loads
 QUERYPM - display pm info
 TRNSL - display c or p side link info
 TEST - test module, single unit or p side link

The following changes will be performed on manual maintenance.

- 1) When p side link test fails a list of cards is displayed on the terminal invoking the test. Currently the ds30a card is listed as faulty. The software will be modified to support ds1 links.
- 2) If a pside link is requested to be busied the status of the other link connecting to the same RCT will be checked. If the status of the other link is not ok the user will be prompted for confirmation.
- 3) The ps node table downloaded to the LTC at load or rts is currently formated for lcm nodes only. The procedure formating that table will be modified to support RCT nodes.

System Maintenance

The following changes will be implemented in system maintenance.

- 1) New peripherals are divided in functional components, where each functional component perform a maintenance action. Two new functional components will be defined for SMR, scm_abbit and pad_ringing_test. The necessary changes will be provided to support these new components.
- 2) SMR will use B-WORD commands to communicate to RCT. The B-WORD will be sent on each DS1 link to the RCT. A reply is expected from the RCT. If the reply is not received the B-WORD hardware will timeout. A new unsolicited message will indicate B-WORD timeout on the corresponding link, in other words the RCT is not communicating on that link.

A/B Bit Diagnostics (NT6X81)

Diagnostics are run by the SCM-100 signalling processor (SP) and by the on board 8085 microprocessor.

The on-board processor diagnostic is invoked at power-on, reset or by the SP diagnostic. The result of tests are held in the OBP status word which is readable by the SP. Diagnostics are run in an on-line and off-line mode. The following summarizes the validation performed by the diagnostics.

On-Board Microprocessor

On-line: monitoring of the sanity byte (set by the OBP) by the SP.

Off-line: monitoring of the OBP diagnostic by the SP.

RAM

The integrity of the command/outgoing A/B data RAM is ensured on-line by comparison of permanent data patterns with data in the SP, and by write/readback tests using unutilised locations. Offline tests are performed by the OBP and the SP. The SP test performs a standard destructive test and provides fault isolation.

The incoming A/B Data RAM is tested on-line by the SP write/read back test at spare locations. Off-line tests are similar to those described above.

ROM

The 2K x 8 program store ROM is tested by the OBP in both on and off line modes. The detection of an error is indicated in the OBP status byte.

Control and Timing

On-line and off-line mode tests are run by the OBP using the internal board loopback and a test byte. The byte propagates from the outgoing A/B RAM to the incoming A/B RAM utilizing the normal control/timing. An error is indicated in the status byte.

Interface Circuits

The interface circuits are tested by the SP diagnostic off-line by the use of the global loop around facility of the time switch board (NTX644).

Pad/Ringing Board (NT6X80)

The diagnostics are run by the SCM-100 signalling processor (SP) and the on board microprocessor, ringing processor (RP) diagnostic both on line and off line.

PAD Hardware

The PAD hardware consists of the connection memory, loss level ROM and SP/RP interface. On and off-line tests are performed by the SP utilizing checksum procedures. The RAM is tested on-line by the SP reading of permanent data and by write/read back tests of a spare location.

The off-line tests are implemented by the SP and the RP diagnostics. The SP performs a standard destructive test with fault isolation.

Ring Hardware

The ring hardware consists of the ringing processor (Intel 8048), ROM, RAM and control circuits.

The ROM is tested on-line and off-line by the RP and errors indicated to the SP by the status byte. The RAM is common with the PAD and is therefore tested as described above.

The RP itself is monitored on-line by use of the sanity byte. Off-line tests are invoked by the SP and run on the RP.

Ref FDOC BC0755, BC0756, BC0761, BV1178

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	SCM-100R CC ALARMS
Feature no	F3304

FEATURE SYNOPSIS

This feature provides alarm handling and reporting in the DMS-100 for the DMS-1 RCT.

FEATURE DESCRIPTION

Alarm capability is provided by the RCT/CCT by means of an alarm panel containing indicators designated against alarm conditions. DMS-100 will collect the alarm indications from the RCT and display them at the PM level of the MAP.

Customer assigned alarms are catered for by the table RCTALM which is used to assign alarm designations.

The SCM-100 receives alarm messages using the B-word facility. The alarm is associated with a designation label from table RCTALM and the PMLOG report is generated. The alarm sets a bit in the RCT status area, sets the RCT node to ISTB and generates an audible alarm. The alarm is reflected in the top level of the MAP Banner display.

If the PM level is entered, and QUERYPM is utilised to select the alarmed RCT, the alarm and label is displayed. Note that if more than one alarm exists they are all displayed.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	ADMINISTRATION
Feature	SCM-100R OPERATIONAL MEASUREMENTS
Feature no	F3306

FEATURE SYNOPSIS

This feature provides Operational Measurements for the SCM-100R peripheral and the DMS-1 RCT.

FEATURE DESCRIPTION

The PM-type 'SMR' is added to the OM group PM2. As the SCM peripherals are similar to the LTC, the same OM registers are kept for the SMR.

The PM-type RCT is added to the OMGROUP PM2. The following registers are kept for the RCT:

(1) Errors : Incremented under error conditions such as unsolicited messages reporting errors. Currently there are two unsolicited messages that will cause this count to be incremented; exception reports and alarm condition set.

(2) Faults : Incremented when a system called diagnostic determines a persistent fault in a node. The count will not be incremented on subsequent system diagnostics until the fault has been cleared. This count will be incremented on a per node basis.

(3) Module system busy usage, unit system busy usage : Incremented when the OM 'HISCAN' sampler scans an RCT which is system busy. This count will be incremented on every scan interval that the RCT is system busy. This count will be incremented on a per node basis.

(4) Module man busy usage, unit man busy usage : Incremented when the OM 'HISCAN' sampler scans an RCT which is man busy. This count will be incremented on every scan interval that the RCT is man busy. This count will be incremented on a per node basis.

(5) CCTFL : This count the number of faults detected by diagnostics on a PM terminal (RCT line card).

(6) CCTSB : This count is the number of system busy requests on PM terminals (RCT line cards).

(7) CCTMB : This count is the number of man busy requests on PM terminals (RCT line cards).

The following registers are not used PM2INITS, PM2LOAD, PM2CXFR, PM2ECXFR.

LGC DTSR is modified to support RCT lines. OFZ, TFCANA, SLU, LMD groups are all utilised to support RCT OMs.

Operational Measurements are taken and reported by the RCT. The measurements available are inherently taken by DMS-100. DMS-1 OMs are not, therefore, utilised.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	ADMINISTRATION
Feature	SCM-100R LOGS
Feature no	F3307

FEATURE SYNOPSIS

This feature ensures that peripheral module and line related LOGS show correct PM type and LEN for the SMR.

FEATURE DESCRIPTION

The SCM Product Development effort has created two new PM_TYPES. A new LTC based peripheral called the Subscriber Module Remote (SMR), and a line controlling device called a Remote Concentrator Terminal (RCT). This feature ensures that all LOGS & SERVORD functions accurately reflect the PM name and the proper LEN format when addressing circuits on an RCT.

The physical layout of the RCT does not resemble the standard line module peripherals. RCTs have no drawers. Instead line cards are configured on shelves, with up to eight cards per shelf. There may be a maximum of 8 shelves configured per RCT. The line cards may support up to 4 circuits each, depending on the card type.

The range of values in the LEN format will be altered slightly to provide for the physical restraints of the RCT.

SITE - 4 CHARS
FRAME - (0 to 99)
UNIT - (0 to 9)
SHELF - (0 to 7)
CIRCUIT - (0 to 31)

Two important differences are worth notice here. The UNIT value, which corresponds to BAYs on LMs, may represent 10 different RCT units because RCTs are not BAYed. Also, note that the SHELF value is substituted where drawers are normally configured for LMs. LEN format for existing LM equipment will be unaffected by this change.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	SCM-100R CC PROTECTION SWITCHING FOR SMR
Feature no	F3308

FEATURE SYNOPSIS

This feature provides support for DS-1 protection line switching in the cc for the SMR peripheral.

FEATURE DESCRIPTION

A protection line is a DS-1 line occupying one p-side port of an SCM-100R. The protection line serves as a spare link which is able to be switched into service to replace a failed DS-1.

A protection switch is initiated in response to a DS-1 link failure or as the result of a manual command at the map. A new command at the CARRIER level of the MAP allows manual control of the switching. This command, PROTSW, allows the enabling, disabling of protection switching for a link and the manual switchover and switchback.

A protection switch has the following effect on call processing:

- calls in talking or ringing are maintained
- calls in processing are lost

This feature supports protection switching of RCTs equipped with two normal links. 1 for n protection is not provided by this feature.

The protection switching function is split between CC and PP processing as follows:

The CC's involved with protlines will be:

1. Establishing the relationship of protlines to normlines via office data, and communicating this information to the SMR when the RCT is put into service.
2. Performing normal DS1 maintenance operations on protlines and protected normlines just as for any other DS1 link.
3. Receiving notification of automatic protection switches and updating the status of protlines and normlines accordingly.
4. Initiating the return to service of switched normlines after notification from PP DS1 maintenance that the alarm has been cleared.
5. Issuing requests for explicit protection switch actions due to MAP commands.

6. Initiating switch back to normal line if protline or normline is busied. Busying normline if this occurs when normline is still faulty.

The SMR's responsibilities will be:

1. Enabling protection on protected lines when they are put into service.
2. Detection of a failing normline and switching of all calls in the failing normline to the protline within approximately 50 ms.
3. Maintaining correct p-side channel mapping and protection information.
4. Performing normal DS1 maintenance operations on the protlines and protected normlines just as for any other DS1 link.
5. Notifying the CC of protection switching operations.
6. Performing protection switching operations on request from the CC.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	ADMINISTRATION
Feature	SCM-100R ADMINISTRATION
Feature no	F3309

FEATURE SYNOPSIS

This feature provides the additions and changes to the administration inventory tables within DMS for support of the SCM peripherals and DMS-1 remote concentrator terminal.

FEATURE DESCRIPTION

Three inventory tables are affected:

- SCM inventory table
- line inventory tables
- RCT inventory table

The SCM inventory table is based upon that used for the LGC. One inventory table (LTCINV) is used for all LGC based peripherals. Three new PM_TYPES are created to cover the SCM peripherals SMR, SMS, SMU.

The line related tables (LENLINES, LNINV, LINEATTR, LENFEAT) are altered to support RCT lines. The line cards within the RCT support either two or four lines (unlike DMS-100F line cards which support one line). Changes are implemented to reflect the maximum number of lines supported as 256 and the actual physical location slot of a line within the RCT.

An RCT inventory table RCTINV is introduced which holds the configuration information for the RCT(s). The table is utilised as follows:

- some of the data stored is utilised by call processing to provide correct ringing information for sub-lines.
- a field in the table indicates what maintenance tests are able to be run on an RCT; SUBSCRIBER LINE TEST or SUBSCRIBER LINE TEST EXTENSION.
- the table contains information on the configuration of the system ie, what SCM the RCT is connected to and which T1 links it uses.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	CALL PROCESSING
Feature	SCM - 100R PP CALL PROCESSING
Feature no	F3310

FEATURE SYNOPSIS

This feature provides the call processing facilities for the SMR variant of the SCM-100 peripheral. The messaging between the SMR and the RCT is by means of A bit/B words over the DS-1 links. The amendments required to the base software system for support of the SMR P-side channel allocation are provided.

FEATURE DESCRIPTION

Each RCT can service up to 256 subscribers. The SMR communicates with the RCT over a ds1 line. Data is passed on the ds1 lines in 193 bit frames, that is, 24 eight bit channels and a framing bit. When a subscriber is being serviced, a channel is allocated for the call that subscriber is associated with. However, since messaging between the SMR and RCT is required for setting up and controlling a call, the ds1 must carry more than speech. Messaging is accomplished by using the least significant bit of each channel every sixth frame.

There are two main types of messaging between the RCT and SMR:

- A bits, occur on each alternate message frame and carry channel oriented information - hook status, dial pulses, ringing data, ani and coin messages
- B words, obtained by assembling 24 B-bits into a 24 bit wide word, comprised of a function byte, address byte and a data byte.

A-Bit Facility

The A-bit facility interfaces with the A/B board which receives A-bits from the RCTs over the DS-1 channels.

Incoming A-bits from the RCTs are utilised as follows:

- detection of onhook/offhook transitions such as flashes and disconnects for active supervision
- detection of dialpulses and dial-flashes for digit collection
- interpreting responses by an RCT to a coin function or ANI command from the LCF (Line Control Feature) in the SMR.

Outgoing A-bits are transmitted to the RCTs are interpreted depending upon the mode set by the B-word facility. These are utilised for ringing, coin and ANI functions.

B-Words Facility (BWF)

B-word messages can be viewed as commands or responses depending on the direction of the message. The RCT does not generate unsolicited B-word messages. Rather, it responds to the last command it received by passing the requested data or an acknowledge status in its next B-word message.

There are 5 types of B-word commands to the RCT:

- Scan eight lines for hook status.
- R/W connection memory (connect subscriber m to channel n).
- R/W auxiliary memory (assign a function, i.e. ani, coin presence, to the A-bit of a particular channel).
- R/W RCT maintenance registers.
- Read alarm registers.

B words occur on alternate message frames.

The B-word facility interfaces with the call processing, maintenance and A-bit facility software as follows:

1. Call Processing

Off hook conditions of inactive lines are sent to call processing from the BWF as unsolicited messages. The off hooks are filtered for 200ms before a message is sent.

Three service requests to BWF are made from call processing:

- start auto-scan for a RCT
- process a B-word command
- data fill a table local to the BWF

i) Maintenance

BWF notifies maintenance of these conditions:

- failure of the online checksum diagnostic
- failure of the online looparound diagnostic
- loss of A/B board sanity
- timeout on a B-word command

BWF accepts service requests to:

- run on-board, offline self diagnostics
- halt the on-board task
- process maintenance b-word commands

- data fill a BWF table

ii) A-Bit Facility

Call processing tasks are able to use the return cid field of the BWF request message to route messages to the A-bit facility.

The BWF interfaces with the 6X81 board (A/B circuit pack) which is micro-processor based. An on board task provides several functions associated with B-word processing.

- Times the RCT response to a B-word command.
- Ensures that B-word responses are received twice from the RCT.
- Sets a flag for BWF when a B-word response has been received or the command has timed out.
- Provides automatic scanning of RCT lines.
- Provides online and offline diagnostics.

Outgoing B-words are written as three bytes into a table on the 6X81 board. Each incoming B-word is written by the hardware into a table where it can be read by the BWF or the 6X81 on board task.

Base System Amendments

The base system software is amended to support the new circuit packs specific to the SCM and the p-side channel allocation for operation with RCTs.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	CALL PROCESSING
Feature	SCM-100 OPERATOR VERIFICATION
Feature no	F3478

FEATURE SYNOPSIS

This feature provides operator verification capability for the DMS-1 RCT when connected to a DMS-100 host.

FEATURE DESCRIPTION

The RCT provides no metallic access for bridging monitor/talk onto RCT lines. Thus in order to provide this capability a three port conference circuit is utilised.

The following restrictions apply:

- monitor/talk connection is only possible on a circuit which carries actual conversation
- monitor/talk access is not provided if there are features in progress.

The operator will receive busy or re-order tones when attempting to access an unavailable line.

The following is a list of the system actions and responses to the operator. The format will be :

Special considerations/Line characteristics

- a) ATT FSD suggested System actions and responses
- b) DMS decision

1. IDLE LINE

Normal Access Available (Voice and Voice/Data)

- a) Normal connection made, no ringing, no tone
- b) Same

Normal Access Not Available (Voice and Voice/Data)

- a) Reorder tone (120 ipm)
- b) Same

Data Only Line

- a) Verification denied, busy tone (60 ipm)

b) Same

2. BUSY LINE

Line Is Traffic Busy (Voice and Voice/Data, Simple Line)

- a) Access connection made, operator may hear conversation, quietline, reorder, busy tone, announcement, etc.
- b) Access connection made, operator hears conversation or data signals. Note: The data signals are not going to be reliable after verification, due to the use of the conference port. However, there is a line option, NO DOUBLE CONNECTION, (NDC) which will not allow testing and verification if the line is busy.

Line Up to Permanent Announcement

Line Off Hook Tone

- a) Permanent signal tone
- b) Same

Line Up To Tone Or Announcement

- a) Same as traffic busy simple line
- b) Same

Line Being Rung

- a) Same as traffic busy simple line
- b) Operator receives busy tone (60 ipm)

Line in Hunting, PBX Line Group (With an idle line in the group)

- a) Normal access connection made, no ringing, no tone
- b) Same

(All lines in the group are busy)

- a) Same as traffic busy simple line
- b) Same

Data Only Line

- a) Verification denied, busy tone (60 ipm)
- b) Same

Line with Call Waiting in Progress

- a) Same as traffic busy simple line
- b) Operator receives busy tone (60 ipm)

Line With Call Forwarding Activated

- a) Same as traffic busy simple line
- b) Same

NOTE: There are no FSD specifications for lines with any other custom calling features in progress. The DMS response will be busy tone (60 ipm).

3. LINE VERIFICATION IN PROGRESS

Line Becomes Idle During Verification

- a) No-test access connection dropped, normal access connection retained
- b) Access connection retained

Line Goes Off Hook During Verification

- a) Normal access connection retained, customer will not receive dial tone
- b) Same

Attempt to Activate Custom Calling Feature

- a) System ignores transient state while line is being verified
- b) Same

4. LINE WITH CUTOFF ON DISCONNECT (COD) OPTION

If a line has the COD option then the operator will be able to get a non-talk connection. However if the non verify party goes on hook then the call is taken down and the operator is sent busy tone (60 ipm).

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	CALL PROCESSING
Feature	SCM - 100R 2 PARTY ANI
Feature no	F3479

FEATURE SYNOPSIS

This feature provides the peripheral processing software required to implement ANI and coin functions for RCT lines on the DMS-1R when connected to a DMS-100 via the SCM-100R.

FEATURE DESCRIPTION

The CC generates ANI/coin requests for lines independently of the p-side particulars of that line. The peripheral must distinguish the two mode types, RCT and LCM, in order to process the CC requests appropriately.

The RCT utilises A/B bit messaging to scan for response and to receive the requests, the LCM applies direct tests to a line and provides mapped response bits.

The SMR specific code is concerned with the processing of CC requests and in the ANI/coin timeout procedure. CC requests are received and decoded by the SMR line primitive decoder. ANI/coin primitives are handled by the SMR ringing task.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	CALL PROCESSING
Feature	SCM - 100R PP COIN FUNCTIONS
Feature no	F3480

FEATURE SYNOPSIS

The feature incorporates coin line support into the SCM-100 software for the DMS-1R RCT. The feature supports coin dial tone first (CDF) and coin semi-postpay (CSP) lines. The feature provides the basic functions of coin presence test, coin return and coin collect.

FEATURE DESCRIPTION

Coin functions are requested by the CC, via the SMR and result in operation of relays at the line card in the RCT. Messaging between the SCM and the RCT utilises the A-bit facility to the desired channel. The RCT detects a response to the operation of the relay and sends a response to the SMR.

The basic functionality required to support coin phones exists in the LGC based software upon which the SMR is built. This feature adds support for RCT coin lines. Code is added at the point at which node specific code is selected. For an RCT node a message sent to the master processor line control feature initiates a sequence within the SMR that involves a coin function and reports the response to the CC.

REFERENCE

BV1177 SCM-100R PP Coin Functions

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	RSB LINE MAINTENANCE
Feature no	F3723

FEATURE SYNOPSIS

This feature supports RSB line maintenance applications for the DMS-1R.

FEATURE DESCRIPTION

The RSB capability for metallic access testing of RCT lines is compatible with existing DMS-100 operation with the following exceptions:

- no metallic bridging is supported by the DMS-1 line card
- metallic access is provided for 'out' testing of the subscriber loop only.

Note that the DMS-1R must be provisioned with SLT-E metallic access equipment.

Where an RSB includes a remote MAP capability the limitations described for F3724 MAP Line Maintenance apply.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	MAP LINE MAINTENANCE
Feature no	F3724

FEATURE SYNOPSIS

This feature provides line testing capability for the DMS-1 when connected to a DMS-100 host via the SCM peripheral.

FEATURE DESCRIPTION

The DMS-1 RT provides two lines maintenance functions:

- line circuit test
- subscriber loop test

The latter capability is entirely optional.

DMS-1 line cards differ from those of DMS-100 significantly for purposes of testing. The cutoff, ring and test access relays of the DMS-100 line card are combined into one relay which isolates the subscriber loop, connects the line card to a 200 loop termination and connects the subscriber loop to the ring test bus. In addition circuit design differences limit the applicability of DMS-100 line test capabilities.

Subscriber loop test equipment may be provided in the RCT as follows:

- SLTD equipment measures and digitizes the voltage, resistance and capacitance parameters of the loop. These are passed to the SCM via B-word messages.
- SLTE provides a relay system which connects a metallic pair from the host to the RCT test bus.

RCT lines are tested under DMS-100 maintenance in the normal manner:

- by command from an LTP
- within an ALT sequence
- diagnostics following fault detection
- subscriber initiated tests

The following access and capability limitations apply when testing RCT lines:

- 1) LTP LEVEL

The following LTP command differences apply:

- POST ; RCT lines LEN refers to shelf No. in range 0-7
- DIAGN ; limitations to extended diagnostic capability
- TSTRNG ; not permitted
- CKTLOC ; different for RCT; refer to F3309
- LCO ; not permitted
- NEXTD ; will post the next shelf
- BALNET ; not permitted
- MONLTA ; implemented via PCM not metallic access
- TRKLTA ; as above
- ORIG ; not available. No capability to bridge the line circuit
- LTA ; only RLS option supported

2) Automatic Line Testing

- SDIAG ; limitations to short diagnostic
- DIAGN ; limitations to extended diagnostic
- LIT ; when SLTE is present in the RCT the leakage resistance may not be negligible
- BAL ; the test is performed but the results are meaningless
- DEFINEC ; for commissioning is the extended diagnostic for RCT lines

3) LINE FAILURE

The extended diagnostic is run.

4) DIAGNOSTICS

The following diagnostic differences apply:

- Ringing and supervision tests are not available because these require the ability to ring the line circuit without ringing the sub loop.
- The PAD test is not applicable as there are no programmable PADS in the RCT line circuit.
- Flux cancellation test is not available as there is no metallic test access to the RCT line shelf.
- Battery feed resistor test not available as above.
- Subscriber loop test is only available if SLTE is provisioned at the RCT.
- Coin relay tests are not available as there is no metallic access.
- Cut-off relay test is not available as there is no cut-off relay.
- Loop detector test; the ring/test relays in the line circuit

and the RCT shelf buffer card are operated.

- Unbalance detector test for coin and multiparty loops is performed.

5) SUBSCRIBER INITIATES TESTS

The silent switchman test is not supported as this requires loop cutoff which interferes with the RCT ringing bus.

The station ringer test will be performed with the exception that no 60 IPM low tone is returned after off hook ground test.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	PP DIGITAL TEST HEAD
Feature no	F3911

FEATURE SYNOPSIS

This feature provides support for the DMS1-R SLT-D digital test head in the SCM-100 R peripheral. The test head is interfaced via the B-word facility in the SMR.

FEATURE DESCRIPTION

The RCT digital test head (AQQ423) allows the measurement of electrical parameters for any line card. The following line parameters are able to be measured:

- ac voltage tests for tip and ring
- dc voltage tests for tip and ring
- resistance (t-g, r-g, t-r)
- capacitance (t-g, r-g, t-r)

Each test is able to be involved in repeated mode in which case the test is executed continuously until a stop test command is issued. The test head is also able to be self calibrated.

The test head is controlled by a SLT module which resides in the SMR. The following is an overview of the SLT module execution sequence:

- CC sends a message to the SLT handler
- SLT checks message for validity and involves the SLT state machine
- B-word test commands are sent to the test head
- measurements are collected and stored
- calculations are performed
- test results are sent to the CC.

REFERENCE

BC0761 PP Digital Test Head

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	SCM-100R PP PROTECTION SWITCHING
Feature no	F3912

FEATURE SYNOPSIS

This feature provides PP software to support protection switching in the SMR. The feature includes capability to sense DS-1 link failure, switch calls from the failed link to the protection link, interface with the A-bit and B-word facilities for p-side port reconfiguration and interface with the CC for call maintenance and MAP reporting.

FEATURE DESCRIPTION

The protection switching is functionally decomposed as follows:

- CC interface is responsible for:
 - a) receiving protection switch requests
 - b) maintaining configuration data passed from the CC
 - c) notifying CC in advance of DS-1 maintenance when protection switching is initiated
 - d) notifying CC when switchovers/maintenance actions are completed.
- ds-1 maintenance interface is responsible for:
 - a) interface with ds-1 maintenance
 - b) analysis of link failures to determine effect on RCTs
 - c) deciding on and initiating link switchovers.
- physical switching is responsible for:
 - a) identifying the digroup of the bad p-side link (A/B)
 - b) issuing the switch link command to the RCT
 - c) enabling A/B signalling on the new link
 - d) updating the RCT link configuration table
 - e) verifying that switchover has occurred
 - f) transferring connections from the old link to the new link and idling the channels on the old link
 - g) modifying the port map array to allow physical I/O to resume on the new link
 - h) initiating the logical switchover (see 2.4) by notifying other areas of the system about the link change.
- logical switching:

ensures that all areas in the SMR system operate successfully during and following p-side link switchovers.

Reference F3308 CC protection switching for explanation of system capability.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	ADMINISTRATION
Feature	SCM100R - OM AND DTSR SUPPORT FOR SMR
Feature no	F5455

FEATURE SYNOPSIS

This feature provides Dial Tone Speed Recording (DTSR) and origination peg counts for the DMS-1R.

FEATURE DESCRIPTION

The following registers are provided for each DMS-1R:

- peg count of DP originations
- peg count of DP originations where dial tone delay exceeds 3 sec
- peg count of DTMF originations
- peg count of DTMF originations where dial tone delay exceeds 3 sec

The measurements are taken and stored by the SCM-100. The results are sent to the CC when requested and the counters cleared. Results are requested for each DMS-1R separately.

References

BF0485

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE
Feature	SCM100R - SMR OVERLOAD CONTROL
Feature no	F5458

FEATURE SYNOPSIS

This feature enhances the call processing and maintenance functions within the SCM-100R to handle peaks of traffic in excess of normal levels. Gradual and non-service affecting call processing degradation is ensured during overloads by the introduction of overload controls.

FEATURE DESCRIPTION

Overload controls are necessary to control degradation during excessive traffic peaks or following hardware destruction or malfunction.

There are a number of elements to this feature:

- The software is enhanced to deal with multiple simultaneous originations in a controlled fashion rather than attempting to service all concurrently. Simultaneous originations are processed uniformly over a short period of time to prevent levels of activity within the peripheral which overloads controller usage and thus causes degradation to calls already in progress.
- Improvements are made to the prioritization of call processing functions during overload conditions.
- New thresholds are implemented to control the overflow of new originations and to control the number of calls in digit collection.

Reference

BF0580

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE AND TESTING
Feature	SCM - PP SMR WARM SWACT
Feature no	F5533

FEATURE SYNOPSIS

The active unit of the duplicated control complex of the RSC controls the entire operation while its inactive mate function in a hot standby mode. SWACT (for switch activity) is the process by which control is transferred to the inactive unit making the previously active unit the inactive mate. Warm SWACT provided with this feature allows this transfer to occur without disrupting stable calls. Calls that are being set up (dialing or ringing) during the SWACT are taken down.

Package	NTX213AB02 SUBSCRIBER CARRIER MODULE(SCM) (UPG. OF NTX213AA)
Feature set	MAINTENANCE AND TESTIN
Feature	LTA ON RCTS (CC)
Feature no	F5757

FEATURE SYNOPSIS

This feature extends DMS-100 line tests to line in the remote concentrator terminal (RCT) equipped with the line test access (LTA) card accessing the metallic test access (MTA). It is implemented as part of the central control (CC) line maintenance software.

FEATURE DESCRIPTION

With the presence of the LTA card, the RCT LTA line maintenance features operates in the following modes:

Bypass: This group tests either a line circuit or a subscriber loop depending on the operated status of the test access (TA) relay and that of the cut-off (CO) relay of the line card under test.

Bypass (IN): In this mode, line circuit is tested for on-hook, off-hook, ringing, ring trip and dial pulse detection.

Bypass (OUT): In this mode, the subscriber loop is tested for foreign AC voltage, foreign DC voltage, loop resistance and loop capacity.

Bypass (BRIDGE): In this mode, the LTA test bus is connected to both the line circuit and the subscriber loop. This allows monitoring the call on the line or actually conv.

End to End: These tests are utilized by extended diagnostic of DMS-100 system to test line card only.

Maintenance on lines can occur in response to any of the following situations:

- A command available at the line test position (LTP) level or at its sub-tending levels e.g., LTPMAN or LTPLTA is invoked from maintenance and administration position (MAP) of DMS-100.

- Tests are performed as a result of available commands invoked at automatic line testing (ALT) level from MAP of DMS-100.

- A line is put on the "shower queu" because two failures are experienced during the processing of the call on that line.

- A faulty digit reception from a line may invoke a line foreign potential test.

- A test is invoked from subscriber set.
- A test is invoked from a test desk.

Ref: FDOC BC1679

NTX215AA02 Status: RTM SES NO.2 - INTERFACE

MAINTENANCE	:	
SES VOICE LINK MAINTENANCE		F6049
CALL PROCESSING	:	
SES VOICE LINK BRIDGING AND RELEASE-CALL PROCESSING		F6050
ADMINISTRATION	:	
TABLE CONTROL FOR SES SYSTEM TABLE SES DATA		F6051
SES TRAFFIC DATA COLLECTION		F6053
CALL PROCESSING	:	
DLSE CALL CLASSIFICATION AND SELTION		F6054
ITSE CALL CLASSIFICATION AND SELECTION		F6055
SES CALL DETAILS		F6056
ADMINISTRATION	:	
SEI SUPERVISOR		F6057
OPERATIONAL	:	
SES FEATURE GROUP B EVALUATION		G0074

Package NTX215AA02 SES NO.2 - INTERFACE
Feature set MAINTENANCE
Feature SES VOICE LINK MAINTENANCE
Feature no F6049

FEATURE SYNOPSIS

This feature is part of the interface between the DMS and the No. 2 Service Evaluation System (No. 2 SES). The No. 2 SES evaluates call completion and produces statistics on call disposition. Call completion and disposition information generated by the No. 2 SES can stimulate maintenance on facilities with poor performance records and help detect some fraudulent uses of network resources. The DMS/No 2 SES interface is an entirely automated system for service evaluation.

Depending on office type, the DMS allows two types of service evaluation to be performed:

1. Incoming trunk service evaluation (ITSE) evaluates calls incoming from an InterLATA carrier point of presence through an access tandem to an end office.
2. Dial line service evaluation (DLSE) evaluates calls that originate from lines and fit the standard North American numbering plan.

FEATURE DESCRIPTION

The No. 2 SES is connected to the DMS by a voice link and a data link. The voice link is used to allow the audio detection capabilities of the No. 2 SES to 'hear' the progress of calls being evaluated by the No. 2 SES. The data link is used by the No. 2 SES and the DMS to communicate via a messaging protocol. This feature provides the following maintenance-related capabilities for the SEI voice link (SEVL):

1. Ability to post the voice link at the trunk test position (TTP) level of the maintenance and administration position (MAP).
2. Ability to perform maintenance functions on the posted SEVL, including use of the TTP commands: BSY, TST, RTS, SY INB and FRLS.
3. Indication of the current status of the posted SEVL: the possible states are IDL, MB, SB, INB, NEQ, CFL, INI, PMB and SZD.

Ref: GFD GFX215AA DMS-100F Service Evaluation Interface
NTP 297-1001-516 Trunk Test Position

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	CALL PROCESSING
Feature	SES VOICE LINK BRIDGING AND RELEASE-CALL PROCESSIN
Feature no	F6050

FEATURE SYNOPSIS

This feature implements DMS call processing for the following functions as related to a call selected for evaluation by the No. 2 SES:

1. Monitor
2. Bridging
3. Release

FEATURE DESCRIPTION

The monitor function makes no network connections, it only notifies call details (AF0099) as to the progression of the call as the events occur.

The bridging function makes one way listen-only network connections from the originator and terminator to the 3 port conference circuit, which has previously been connected to the voice link (AF0076). Bridging also includes the monitor function.

The release function terminates the bridge or monitor function by notifying cal details. If the call is bridged, it will also release the network connections to the 3 port conference.

Ref: GFD GFX215AA DMS-100F SERVICE EVALUATION INTERFACE
DDOC AF0076 SES VOICE LINK MAINTENANCE

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	ADMINISTRATION
Feature	TABLE CONTROL FOR SES SYSTEM TABLE SES DATA
Feature no	F6051

FEATURE SYNOPSIS

This activity provides the table control and the office parameter for the DMS service evaluation interfaces (SEI). Refer to the No. 2 Service Evaluation System (SES), general feature description GFX215AA for more information on the SEI.

FEATURE DESCRIPTION

This feature adds a new table named SEILINKS. The table contains data pertaining to each SEI. DMS provides at most two distinct SEI's in any office. Therefore, the table can include a maximum of two tuples, one for DLSE and one for ITSE.

This feature also creates a new office parameter. The parameter SEP_EQIPPED denotes if the SEIs exist in the office. SEP_EQIPPED is included in table OFCENG as a boolean which can be set to either Y or N.

Ref: DDOC AF0076 SES VOICE LINK MAINTENANCE

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	ADMINISTRATION
Feature	SES TRAFFIC DATA COLLECTION
Feature no	F6053

FEATURE SYNOPSIS

Provide the operational measurements (OM) needed for the service evaluation interface (SEI) traffic data collection and send to the SEI the new data when it becomes available.

FEATURE DESCRIPTION

This feature implements a new OM group to provide traffic data to the SEI. The OM group SETRAF is implemented for collection of DLSE and ITSE traffic data.

The group SETRAF contains two tuples, each with eight registers. One tuple holds DLSE traffic data and the other tuple holds ITSE traffic data. All registers are peg registers. That is, the count they contain are updated each time a specific event occurs.

REF: GFD GFX215AA DMS-100F SERVICE EVALUATION INTERFACE
DDOC AF0076 SES VOICE LINK MAINTENANCE
NTP 297-1001-114 DMS-100F OPERATIONAL MEASUREMENTS (OM)

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	CALL PROCESSING
Feature	DLSE CALL CLASSIFICATION AND SELTION
Feature no	F6054

FEATURE SYNOPSIS

This feature provides call classification as either InterLATA or IntraLATA, call selection and OM pegs of DLSE calls for service evaluation.

FEATURE DESCRIPTION

This feature examines call classification, selects candidates and pegs some of the traffic count OMs.

Call Classification : is the first step in evaluating a call. Every call must be classified in order to peg the traffic counts for that call's classification type.

Call Selection : is the process of determining whether a call is a candidate for evaluation. DLSE candidates are a subset of calls that originate from lines and use the standard North American numbering plan. These calls may be interLATA or intraLATA.

OM Pegging : two OM counts in the DLSE tuple, used for the traffic data message, are pegged by this feature.

Ref: CIFD GFX215AA, DDOC AF0076

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	CALL PROCESSING
Feature	ITSE CALL CLASSIFICATION AND SELECTION
Feature no	F6055

FEATURE SYNOPSIS

This feature provides call classification and selection of incoming trunk service evaluation (ITSE) calls.

FEATURE DESCRIPTION

this feature examines call classification, selects candidates and pegs some of the traffic count OMs.

Call Classification : is the first step in evaluating a call. Every call must be classified in order to peg the traffic counts.

Call Selection : is the process of determining whether a call is a candidate for evaluation. Selection occurs after the call has been routed. All feature group C (FGC) and feature group D (FGD) type calls incoming from an IC POP through at AT to an end office are ITSE candidates for evaluation.

Two ITSE OMs used for the traffic data message are pegged by this feature.

Ref: GFD GFX215AA DMS-100F SERVICE EVALUATION INTERFACE
DDOC AF0076 SES VOICE LINK MAINTENANCE

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	CALL PROCESSING
Feature	SES CALL DETAILS
Feature no	F6056

FEATURE SYNOPSIS

This feature performs the following functions:

- determination of bridging suitability for the selected call
- collection of call detail information on the evaluated call
- communication of call events to the appropriate supervisor (ITSE or DLSE)
- pegging of three traffic data registers of OM group.

FEATURE DESCRIPTION

Calls under evaluation by the DMS/No. 2 SES interface are monitored for events of interest to the No. 2 SES. In addition, they may be bridged to a No. 2 SES voice link if they are trunk terminating calls. In either case, information about the call (call details) are sent to the No. 2 SES for the generation of reports on call completion. Periodically at least every hour, traffic data is sent to the No. 2 SES to provide a statistical framework for the reports. Following information is gathered and sent to No. 2 SES:

- ID of the originator
- ID of the terminator
- ID of the facilities used
- disposition of the call.

Ref: GFD GFX215AA, DDOC AF0076

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	ADMINISTRATION
Feature	SEI SUPERVISOR
Feature no	F6057

FEATURE SYNOPSIS

This feature provides the capability to accept and send messages via the data link to the No. 2 Service Evaluation System (No. 2 SES). It also coordinates the data link, voice link, call processing and data collection functions of the Service Evaluation Interface (SEI). ..SD

FEATURE DESCRIPTION

This feature is activated from table SEILINKS by messaging on the data link, which is a dedicated, private line from the No. 2 SES that interfaces with a modem at the DMS switch. The modem is connected through an RS232-C interface to a multi-protocol controller (MPC) card on an IOC (input/output controller) shelf.

Messages from the No. 2 SES over the data link cause the DMS to perform a task and/or send a response message. The DMS also sends some unsolicited messages and error condition messages to the No. 2 SES. The current status of both the supervisor and the datalink can be found by using the CI command SEIQUERY.

Ref: GFD GFX215AA, DDOC AF0076

Package	NTX215AA02 SES NO.2 - INTERFACE
Feature set	OPERATIONAL
Feature	SES FEATURE GROUP B EVALUATION
Feature no	G0074

FEATURE SYNOPSIS

This feature provides call classification, call selection, and Operational Measurement pegs for Feature Group B Incoming Trunk Service Evaluation calls.

FEATURE DESCRIPTION

This feature is part of the interface between the DMS and the No. 2 Service Evaluation System (No. 2 SES). The No. 2 SES evaluates call completion and produces statistics on call disposition. The DMS/No.2 SES interface is an entirely automated service evaluation system.

Call classification is the first step in evaluating a call. Every call must be classified to peg the correct traffic counts. Calls are classified as CARRIER or NON CARRIER.

Call selection determines if the call is a candidate for evaluation. Selection of the call occurs after the call has been routed. When the No. 2 SES requests a call for evaluation, every call has its classification checked until the type of call requested is found.

Incoming Trunk Service Evaluation Feature Group B calls peg the OM registers in the OM group SETRAF.

Ref: FDOC AF1257

NTX218AA03 Status: RTM 1A/1B EADAS INTERFACE

INTERFACES	:	
1A/1B EADAS - BX.25 INTERFACE		F2555
INTERFACE	:	
EADAS - OM I/F		F3916
EADAS MMI		F3917
OM USAGE TO EADAS		F3919
EADAS - FLEXIBLE OM TRANSFER PERIOD		F5407
EADAS DATAFILL SEQUENCE SIMPLIFICATION		F5759
ADMINISTRATION	:	
EADAS DATA FORMAT ROBUSTNESS		F5927

Package	NTX218AA03 1A/1B EADAS INTERFACE
Feature set	INTERFACES
Feature	1A/1B EADAS - BX.25 INTERFACE
Feature no	F2555

FEATURE SYNOPSIS

This feature is concerned with receiving polls from the EADAS computer and transmitting proper responses to it (a transceiver function). The main work performed is the transmission of 30 minute, hourly and 24 hour responses. The time response is also provided, as well as a number of responses intended to deal with application level error conditions. This feature also implements a new command, EADASHOW, that allows the EADAS transmission buffer to be dumped to the MAP or printer.

FEATURE DESCRIPTION

EADAS/DC

EADAS/DC is an AT&T operational support system which collects operational measurement (OM) data from telephone switches over series data links. The EADAS computer sends a request for data (a poll) over a logical channel, and the switch responds with either the data requested or a message indicating why the data cannot be sent.

The communication with EADAS/DC is via the multi protocol controller (MPC) hardware using BX.25 protocol (features F3913, F3914, F3915, F3918).

EADAS/DC project comprises the following features:

F3916 (EADAS-OM I/F). This feature accumulates and formats 30 minute, hourly and 24 hour data as required by EADAS.

F3917 (EADAS-MM I/F). This feature adds new OM commands so that they work with EADAS accumulating classes.

F3919 (OM usage samples to EADAS). This feature creates a new OM group USAGSAMP identical to existing quantities FASTSAMPLES and SLOWSAMPLES so that they can be transmitted to EADAS.

F2555 (IA EADAS-BX.25 I/F) The present feature.

This Feature

The transceiver for each logical channel constantly monitors its channel for a poll from EADAS. Upon receipt of a poll, the transceiver evaluates its validity and determines whether or not EADAS is locked out from the desired information. Lockout occurs when a request for data is made within the specified lockout period or the data is still in the process of being updated. On the basis of validity and lockout determinations, a re-

sponse message is sent to EADAS containing either the desired information or notification of an error condition. If data is sent in the message, and the data is updated (and therefore corrupted) during the transmission process, an overwritten data message is sent to EADAS, immediately after transmission, to announce this fact.

Error conditions detected by lower level interface software (i.e. BX.25 levels 1-3) of which the application level is notified are all handled in a uniform manner: transmission of application data is stopped as quickly as possible. Low level software performs any necessary error recovery for a channel on which an error is detected. Finally, the application software waits for the next poll from EADAS.

A new log type, 'EAD', is created for this feature. Logs of this type are used to record errors occurring in data communication (BX.25), and application level errors resulting from invalid polls from EADAS. They are also used to record receipt of a message announcing that EADAS is going down.

Two office parameters are added to the table OFCVAR for this feature. EADAS_MPC_AND_LINK allows the telco to define the MPC number and the link number of the link to be used for EADAS. EADAS_ENABLED allows the telco to turn this feature on and off.

At least one MPC must be equipped. A spare MPC should be provisioned. Switching back and forth between MPCs is done through this features office parms EADAS_MPC_AND_LINK; and EADAS_ENABLED. This does not require a restart, and may be done at any time. The change does not take effect until the next transmission of data is complete. Changing which MPC and/or LINK is used by the transceivers will not maintain communication with the EADAS computer, and it is the telco's responsibility to design/provide the necessary equipment to allow manual switching of the EADAS computer from one MPC to another if this facility is desired.

Operation

When EADAS is present in a switch, the first three OM classes are assumed to be the EADAS 30 minute, 60 minute, and 24 hour classes, respectively. These classes must be datafilled with the OM groups and fields expected by EADAS. These groups and fields are documented in an appendix to the EADAS/DC product specification agreement.

Whenever one of these classes is marked as ENABLED in table OMACC, the class will be accumulated by the OM system. When a poll is received from the EADAS system for the class, it will be transmitted as follows:

- . If the request occurs in lockout period, a time conflict response is sent to EADAS.
- . If accumulation is in progress, a time conflict response is sent.
- . If the data is changed during transmission by the accumulator, an

overwritten data message is sent to EADAS.

- . If the poll is for a class that is not available on this channel, an invalid request response is sent to EADAS.
- . If the class is disabled in table OMCACC, accumulation for that class is discontinued, and polls for that class are responded to with an invalid request response. A log is generated for this case as well, thus notifying the operators that there is a discrepancy between what EADAS expects and what is ENABLED. Otherwise the data requested is sent.

In the normal course of events, when a switch is first loaded with a load containing the EADAS/DC software, the eadas-enabled office parm is set to N. Eadas-mpc-and-link should have been datafilled with the proper MPC number and link number. The buffer size office parms should also have been set. The first three OM accumulating classes should have been defined as EADAS 30 minute, 60 minute, and 24 hour accumulating classes. The telco craftsman verifies all this and performs any necessary steps to achieve this state (see individual feature documents for details). The craftsman then sets EADAS_ENABLED to Y and the EADAS system is off and running.

References:

FSD 45-09-0100 EADAS Interface
PSA-EADAS/DC Interface
F3913, F3914, F3915, F3916, F3917, F3919

Package NTX218AA03 1A/1B EADAS INTERFACE
 Feature set INTERFACE
 Feature EADAS - OM I/F
 Feature no F3916

EADAS-OM INTERFACE (F3916/BC1365)

FEATURE SYNOPSIS

This feature is part of the EADAS (Engineering Administration Data Acquisition System) optional package, and provides for the incorporation of EADAS OMCLASSES into the DMS 100F OM systems.

FEATURE DESCRIPTION

The EADAS/DC, (DC = DATA COLLECTION), PACKAGE provides for subsets of DMS Operational Measurement, (OM), data to be transmitted for downstream processing. The data is divided into three classes. They are:

1. 30 MINUTE DATA
2. 60 MINUTE DATA
3. 24 HOUR DATA

The telco will be able to datafill GROUPS, FIELDS and KEYS for the EADAS classes.

BACKGROUND INFORMATION

EADAS is a minicomputer based system that provides near real-time data collection and surveillance from many central office switching systems. Functionally, the switching system supplies basic traffic data to EADAS. The measurements provide peg count and usage information on different components of the switching system which reflect the features and capabilities that affect performance.

The total EADAS package would consist of two entities which we call EADAS/DC and EADAS/NM, (NM = NETWORK MANAGEMENT). This feature does NOT provide for any part of EADAS/NM.

OMCLASSES

The EADAS classes must be the first three OMCLASSES datafilled.

The user must datafill his EADAS/DC OM classes as follows, using the OMCLASS command and making changes to Table OMACC

1. 30 minute data
 EADAS30M Y HALFHOURLY C00
2. 60 minute data

EADAS60M Y HOURLY C00

3. 24 hour data

EADAS24H Y DAILY 0 C00 0 C00

GROUPS and FIELDS

Groups and fields must be added with the OMACCTAB command using the groups and fields recommended by Bellcore. This will depend on the EADAS GENERIC.

KEYS

The user will be allowed to select specific tuples for transmission by using the EADASKEY command and NOT the OMACCKEY command.

OFFICE GENERIC ID

The user will datafill his GENERIC ID, (information about Generic id must be obtained from Bellcore), in table OFCVAR.

RECORDING EADAS CLASSES ON DISK/TAPE

Since OMTAPE does NOT support field and key select. EADAS classes should not be scheduled for output to Disk/Tape.

PRINTING EADAS CLASSES

OMPRINT

The EADAS classes can be scheduled for print output. However only keys scheduled for transmission will be printed.

OMSHOW

The OMSHOW command can be used for EADAS classes.

OMREPORT

This is NOT supported for EADAS.

EADAS SPECIFIC RESTRICTIONS

Unless the office parm EADAS_SHORT_XFER_ALLOWED is set to Y Only THIRTY MINUTE transfer period is allowed in an office having the EADAS PACKAGE. This is because the EADAS GENERIC requires that the data be stable for 30 minutes.

The office parm OMXFR must be set to X30 in table OFCENG.

USER DEFINED STORE FOR EADAS

The user will define the store he needs for EADAS by datafilling the following office parameters in table OFCENG.

- a. EADAS30M_BUFFER_SIZE (For the 30 minute class).
- b. EADAS60M_BUFFER_SIZE (For the 60 minute class).
- c. EADAS24H_BUFFER_SIZE (For the 24 hour store).

These parameters should be datafilled early and a reload restart should be done immediately thereafter.

After the initial allocation of store, only NT Technical Support can make a change. The implication of this is that the customer MUST TAKE GREAT CARE in choosing the values of these buffer sizes. The Data Schema (DS) section of this document provides the method for doing this.

GENERAL EADAS REQUIREMENTS

Since EADAS will have some special OMCLASSES, we can't expect the usual accumulating process to take care of us.

The EADAS classes will have to be accumulated first.

We are the most time critical OM process and we always come first.

We will be storing our data in the order we need to transmit in. It is exactly the way one wants to have it output.

Package	NTX218AA03 1A/1B EADAS INTERFACE
Feature set	INTERFACE
Feature	EADAS MMI
Feature no	F3917

EADAS MAN-MACHINE INTERFACE (F3917/BC1366)

FEATURE SYNOPSIS

This feature is part of a group of features belonging to the Engineering and Administrative Data Acquisition System (EADAS) package. The EADAS package is optional. When it is present, this features is required.

The EADAS package sends Operational Measurement (OM) data from a DMS Switch to an EADAS computer when the DMS receives a poll. EADAS software retrieves OM data from the OM System for transmission. This feature implements the Man Machine Interface (MMI) to OM classes belonging to EADAS.

FEATURE DESCRIPTION

EADAS OM classes are different from other OM classes in that they are used in datalink transmission and store their data separately from other OM classes. These differences demand that new MMI commands be created and certain MMI commands be changed to accomodate EADAS OM classes.

MMI FOR EADAS OM CLASSES

A. EADASFMT Command

It is necessary for the Telco EADAS Administrator to be able to obtain the format of the data being sent over the datalink. OM data is polled by class and a class is composed of groups which contain tuples and fields. A new command called EADASFMT displays the precision of an EADAS OM class, the groups belonging to that class, the section id of the group and the key and info fields of all group tuples.

B. EADASKEY Command

Another requirement of EADAS is to allow selection of which group tuples are to be transmitted. A new command called EADASKEY selects the keys of groups that are to be transmitted. This command allows the Telco to transmit only chosen keys for a poll.

C. OMDUMP MMI Command

OM classes are datafilled in table OMACC via the OMCLASS command and are "dumped/restored" through use of the OMDUMP command. EADAS OM classes are also datafilled in table OMACC and need to be dump restorable. The OMDUMP command restores OM classes by retrieving the information needed to recreate all the OMCLASS, OMACCTAB and OMACKEY commands performed upon the OM class. Before a system dump is done, these commands are output to a file.

During the system restore the commands are re-executed to restore OM classes to their pre-dump structure.

EADAS OM class structure is defined by the above three commands plus the EADASKEY command. Unless the EADASKEY commands are re-executed after a dump, the EADAS OM classes are not fully restored. A natural addition to the OMDUMP command is to have EADASKEY commands be output when the EADAS feature is present.

OMDUMP can also be used to show the selected fields for each group in a class if "FORMAT" is used as the second parameter instead of "COMMANDS." This is supported for EADAS OM classes as it is for OM classes because we do not want the meaning of a command to depend on the type of class it is operating on. The Telco must know from documentation that the EADASFMT command is used to get the complete structure of an EADAS OM class.

D. Summary of EADAS MMI Interface

OMCLASS Command OMCLASS is not changed. OMCLASS defines a new EADAS OM class or OM class.

OMACCTAB Command OMACCTAB is not changed. OMACCTAB adds/deletes groups and fields from EADAS OM classes or OM classes.

OMSHOW Command OMSHOW is not changed in any way for OM classes. OMSHOW displays EADAS OM class tuple data only for keys (tuples) which are transmitted. Tuples deleted by EADASKEY do not appear.

OMDUMP Command OMDUMP is not changed in any way for OM classes. OMDUMP outputs EADASKEY commands performed on EADAS OM classes.

OMACKEY Command OMACKEY works the same way for OM classes. Only the tuples of an EADAS OM class selected for transmission can be selected for printer printing. These are the only keys that exist in an EADAS OM class.

EADASKEY Command EADASKEY does not work on non-EADAS OM classes. EADASKEY selects the keys of a group in an EADAS OM class that are to be transmitted. If no keys are selected with this command then the default is to transmit all keys.

EADASFMT Command EADASFMT does not work on non-EADAS OM classes. EADASFMT displays class structure and transmission information for EADAS OM classes.

Note that OMREPORT is not supported for EADAS OM classes.

Package	NTX218AA03 1A/1B EADAS INTERFACE
Feature set	INTERFACE
Feature	OM USAGE TO EADAS
Feature no	F3919

OM USAGE SAMPLES TO EADAS (CC) (F3919/BC1370)

FEATURE SYNOPSIS

This feature is part of a group of features belonging to the Engineering and Administrative Data Acquisition System (EADAS) package. The EADAS package is optional. When it is present, this feature is required.

The EADAS Package sends Operational Measurement (OM) data from a DMS Switch to an EADAS computer when the DMS receives a poll. DMS software retrieves OM data from the OM System for transmission to EADAS. This feature creates a new OM group called USAGSAMP for transmission to EADAS. USAGSAMP contains 1 tuple with 2 fields. The slowsamp field contains the number of slow scans performed during the accumulating period. The fastsamp field contains the number of fast scans performed during the accumulating period.

FEATURE DESCRIPTION

OM INTERACTION WITH EADAS

The EADAS computer polls the DMS switch for OM data by class. A new OM group called "usagsamp" is created so that two OM related measurements can be transmitted as group data of an EADAS OM class. EADAS OM classes have the same structure as standard OM classes but are used solely for accumulation of OM data that is sent to EADAS.

NEW USAGSAMP OM GROUP

Usagsamp has 1 tuple with 2 fields and contains information that is needed to interpret the usage register counts of other groups. One field, "slowsamp," marks the number of times that states have been scanned for slow usage registers. The second field, "fastsamp," marks the number of times that states have been scanned for fast usage registers. Knowing the number of times a state was scanned in a period of time allows interpretation of the usage count.

USAGE COUNTS

Slow usage registers have a scheduled 100 sec delay between each scan and the fast usage registers have a scheduled 10 sec delay between each scan. Unfortunately, it can not be assumed that 18 slow scans (or 180 fast scans) are done for a half-hour accumulating class. This is because the DMS gives priority to call processing functions. The count of samples taken during any class period is tracked so that the counts in usage registers can be evaluated. (Peg registers update their counts at the time of

their event and can be evaluated solely from the start and stop time of the class.)

DATA TRANSMISSION TO EADAS

The format for any transmission to EADAS is specified by the DMS-100F - EADAS Product Interface Specification. Classes are sent to EADAS as "measurement data" which is composed of a "measurement data header" and a "measurement data body." Sample counts are associated with each class and must be put into the measurement data body. A standard procedure is used to format data from the OM group structure to fit into the data body. Since sample data is not contained in any OM group, the choice was made to create a new OM group to contain this information. The standard formatting procedure can now be used to format the data into the data body.

Sample count information is given in the OMSHOW display, OMPRT and OMREPORT printouts and the OMTAPE 'p record' for evaluation of usage registers in OM classes.

The sample count information must also be made available for data transmission to EADAS so that the usage registers in EADAS classes can be evaluated. The data format for EADAS transmission is based on class and group structure. Forming the sample count information into an OM group expedites transmission.

Package	NTX218AA03 1A/1B EADAS INTERFACE
Feature set	INTERFACE
Feature	EADAS - FLEXIBLE OM TRANSFER PERIOD
Feature no	F5407

EADAS ENHANCED OM TRANSFER PERIOD (F5407/BC1382)FEATURE SYNOPSIS

This feature, which is part of the EADAS (Engineering Administration Data Acquisition System) optional package, allows an office the option of having EADAS/DC and OM transfer periods of less 30 minutes.

FEATURE DESCRIPTION

This feature allows the OMXFR period to be set to 5 or 15 minutes in an EADAS office. It ensures that the EADAS OM classes do not get corrupted by the accumulation which occurs every OMXFR period. This guarantees that the EADAS data will survive for as long as required by the EADAS system. It does NOT improve the performance of the OMHISTORY feature, nor does it replace OMHISTORY with another mechanism for extracting 5-minute data.

In order to retain the integrity of the EADAS/DC data, an office parameter can be set if the office chooses a transfer period of less than 30 minutes. This can be done at any time during the life of the BCS but it requires a Reload Restart to take effect.

In order to turn this feature on, the office must have available THREE blocks of memory. Their sizes, (in words), must be greater than or equal to the amounts entered in EADAS30M_BUFFER_SIZE, EADAS60M_BUFFER_SIZE, and EDAS24H_BUFFER_SIZE respectively.

Since 3 large blocks of contiguous memory must be allocated, there is a possibility that the Reload Restart will fail to turn on the feature. In this case the office parm will be reset to the default value.

When this feature is turned on, EADAS 30 Minute Data will be stable for 30 minutes, EADAS 60 Minute Data will be stable for 60 minutes, and EADAS 24 Hour Data will be stable for 24 hours.

TURNING ON THE FEATURE

REQUIREMENTS:

1. Each of the three parameters:

EADAS30M_BUFFER_SIZE,
EADAS60M_BUFFER_SIZE,
EADAS24H_BUFFER_SIZE

found in Table OFCENG, must be greater than 0.

2. There must be three blocks of store available with sizes greater than or equal to the amounts in requirement 1.

The feature is turned on by setting the office parm EADAS_SHORT_XFER_ALLOWED to Y in table OFCOPT and doing a Reload Restart.

If the office parm is set at the same time that the buffer sizes in requirement 1 are set, then only one Reload Restart is needed.

If the store is not available then the subsequent Reload Restart will set EADAS_SHORT_XFER_ALLOWED to N.

The transfer priod, OMXFR, in Table OFCENG, will NOT be changed.

TURNING OFF THE FEATURE

Set the office parm EADAS_SHORT_XFER_ALLOWED in Table OFCOPT to N.

Do a warm restart.

Turning off the feature will not reset the office parm OMXFR in table OFCENG. If this parm is not set to X30 then data may be overwritten during transmission resulting in overwritten data messages send EADAS. This could also result in time conflict responses messages being sent to EADAS.

EADAS_SHORT_XFER_ALLOWED is initialized to N.

Package	NTX218AA03 1A/1B EADAS INTERFACE
Feature set	INTERFACE
Feature	EADAS DATAFILL SEQUENCE SIMPLIFICATION
Feature no	F5759

FEATURE SYNOPSIS

This feature allows the buffer sizes of the EADAS (Engineering and Administrative Data Acquisition System) OM (Operational Measurement) classes to be changed after their initial datafill.

FEATURE DESCRIPTION

This feature is an enhancement of the optional EADAS IDC package (NTX218). To change a buffer's size, the associated buffer size in table OFCENG (EADAS 30M_BUFFER_SIZE, EADAS60M_BUFFER_SIZE, or EADAS24M_BUFFER_SIZE) is changed, and a reload restart is performed.

To calculate the value of this office parameter is as follows:

EADAS30M_BUFFER_SIZE=10,000+

(3³number_of_customer_group)+
(3²number-of-customer-subgroups)+
(8³number-of-trunk-groups)+
(5³number-of-virtual-facility-groups)

EADAS60M_BUFFER_SIZE=100+

(7³max-number-of-TSMS-instructions)

EADAS24H_BUFFER_SIZE=100+

(7³max-number-of-TSMS-instructions)

This parameter can be changed from 0 default to non zero value from 0 to 32,000. Reallocation should not be considered a substitute for proper buffer size calculations and generous initial allocation is recommended rather than coping with unexpected office growth between BCS's.

Package	NTX218AA03 1A/1B EADAS INTERFACE
Feature set	ADMINISTRATION
Feature	EADAS DATA FORMAT ROBUSTNESS
Feature no	F5927

FEATURE SYNOPSIS

This feature makes EADAS INTERFACE package more robust. Specifically it eliminates the need for S/W changes between BCSs when fields of OM groups change.

FEATURE DESCRIPTION

This feature provides DMS-100 with flexibility in assigning OM measurements into "sections" for transmission to EADAS. The function of EADAS/DC is not changed in any way. Only certain OM MMI commands have become obsolete for use with EADAS/DC OM classes and EADAS MMI commands have had refinements applied to them.

Ref: FDOC AF0019

NTX219AB03 Status: RTM TEEN SERVICE

RINGING	:	
TEEN SERVICE		F2547
SERVICES	:	
TEEN SERVICE - SELECTIVE CFW		F6521
STATION FEATURES	:	
TEEN SERVICE ENHANCEMENT		G0073

Package	NTX219AB03 TEEN SERVICE
Feature set	RINGING
Feature	TEEN SERVICE
Feature no	F2547

FEATURE SYNOPSIS

This feature provides the following ringing options to individual and two-party lines with superimposed ringing:

- o Single party coded ringing (Teen Service)
- o Two-party coded ringing with each party hearing both codes
- o Two-party coded ringing with each party hearing only own code.

FEATURE DESCRIPTION

This feature allows code 2 ringing to be applied to individual lines and two-party lines which normally receive code 1 ringing. Stations in the same residence will be assigned two directory numbers (DN). It is useful typically for business partners or for parents and their teenage children.

The first DN will be listed under the parents' (or partner A's) name and the second DN, will be listed under their teenager's (or partner B'S) name. With two ringing codes, the parents (or partner A) and their teenager (or partner B) will be able to identify to whom the call is for.

There will be four methods of implementations of the feature. They are as follows:

METHOD 1: SINGLE PARTY CODED RINGING

Two individual lines are provided. On calls to the first line, code 1 ringing is applied and on calls to the second line, code 2 ringing is applied. Choice of billing between individual Dns and special billing number (SPB) will be provided.

METHOD 2: TWO PARTY CODED RINGING WHERE EACH PARTY HEARS BOTH CODES

Single line is used for this method. Code 1 ringing applied to both stations indicates calls to DN1 and code 2 ringing applied to both stations indicates calls to DN2. Choice of billing between DN1 and SPB

will be provided. The telephone stations will be equipped with bridged ringers.

METHOD 3: TWO-PARTY CODED RINGING WHERE EACH PARTY HEARS ONLY HIS/OWN CODE

Single line is used for this method. Code 1 ringing is applied for calls to DN1 only and Code 2 ringing is applied for calls to DN2 only. Bridged ringers cannot be used for this arrangement. Choice of billing between DN1 and SPB will be provided.

METHOD 4: TWO-PARTY FREQUENCY SELECTIVE RINGING

Single line is used for this method. When the call is for DN1, normal ringing (2 seconds on, 4 seconds off) will be applied to DN1 while two bursts of ringing (during the 4 seconds silent interval of DN1) will be applied to DN2. When the call is for DN2, normal ringing will be applied to DN2 while two bursts of ringing (during the 4 seconds silent interval of DN2) will be applied to DN1. Choice of billing between DN1 and SPB will be provided. The telephone stations will be equipped with bridged ringers.

In all of the above four methods, both NT and AT&T billing format will be supported. Custom calling feature i.e. call waiting, call forwarding etc. will be provided. Revertive ringing capability should also be provided for method 2,3 and 4.

Package	NTX219AB03 TEEN SERVICE
Feature set	SERVICES
Feature	TEEN SERVICE - SELECTIVE CFW
Feature no	F6521

FEATURE SYNOPSIS

When call forwarding is activated for the primary directory number (PDN) on a teen service line, calls to a secondary directory number (SDN) on the same line may be forwarded to the same directory number (DN) as the PDN or they may be left unforwarded.

FEATURE DESCRIPTION

Customers who subscribe to both teen service and call forwarding must specify the way in which they want calls to their SDNS to be handled when call forwarding is activated for their PDN. Calls to an SDN whose PDN is forwarded can terminate at the line serving that SDN (i.e., be left unforwarded), or they can be forwarded to the same DN as the PDN. It is not necessary that all SDNS on a teen service line handle call forwarding in the same way.

Any change to an SDN's method of handling call forwarding is done by service order.

Ref: FDOC AF0815

Package	NTX219AB03 TEEN SERVICE
Feature set	STATION FEATURES
Feature	TEEN SERVICE ENHANCEMENT
Feature no	G0073

FEATURE SYNOPSIS

This activity allows the teen service feature to be supplied to single-party lines connected to Line Modules.

The teen service feature can also be supplied to single-party lines that use frequency selective ringing. Only one Secondary Directory Number (SDN) can be defined for each such line.

FEATURE DESCRIPTION

Frequency selective teen service lines connected to a Line Concentrating Module or a Line Module use a short-short ringing cadence for their Secondary Directory Number. If the teen service line is connected to a Subscriber Carrier Module (SCM) device, the SDN cadence is two long rings.

This feature is only available on single-party flat-rate and single-party message-rate lines.

Ref: FDOC AF1256

NTX243AA07 Status: RTM AMA TELEPROCESSING SYSTEM(AMATPS)

NUMBER IDENTIFICATION/CHARGING :	
AMA TELEPROCESSING SYSTEM(AMATPS)	F2514
MAINTENANCE :	
DISPLAY DPP THROUGH IOD LEVEL	F2879
NUMBER IDENTIFICATION/CHARGING :	
DPP ROBUSTNESS ENHANCEMENTS	F6246
OPERATION :	
380 MBYTE DISK FOR DPP	G0099

Package	NTX243AA07 AMA TELEPROCESSING SYSTEM(AMATPS)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	AMA TELEPROCESSING SYSTEM(AMATPS)
Feature no	F2514

FEATURE SYNOPSIS

The automatic message accounting tele processing system (AMATPS) consists of a Host Office Collector (HOC), located at or near the Revenue accounting office (RAO), which polls central offices for AMA data. The subsystem at the central office that transmits AMA data to the collector on request is called AMA transmitter (AMAT).

The purpose of this feature is to provide the interface to the DMS-100 AMAT. The interface provides the following:

- Capturing the logs generated by the DMS-100 AMAT into the DMS-100 log system.
- Providing a MAP interface to the DMS-100 AMAT.
- Downloading the DMS-100 AMAT.
- DPP - HOC I/F S/W

FEATURE DESCRIPTION

In DMS-100 the AMAT function is implemented using a distributed processing peripheral (DPP). The DPP implements a duplex configuration and connects to two IO controllers of the DMS-100. The DPP provides a data stream interface (DSI) through which billing data can be received from the DMS-100. The DSI has the appearance of a tape drive. The DPP receives billing data from the DMS-100, saves it on its private disk and transmits it to the collector when requested, using Bellcore protocol.

In addition to the data stream interface (DSI), the DPP also provides a maintenance interface. The maintenance interface allows the DMS-100 and the DPP to exchange non billing information as described below.

LOGS:

The DPP generates its own logs and sends them to the DMS-100 to be captured into the DMS-100 log system. A new report group, DPP, has been added to the DMS log system to provide information concerning DPP events. Three log reports can be generated - DPP100, DPP101, DPP102.

MAP INTERFACE:

The DPP maintenance can be performed from any DMS maintenance administration positions (MAP) connected to the DMS-100. The MAP interface pro-

vides an extensive command set that allows the craftsperson to maintain the DPP. A new level has been created for the purpose of providing maintenance commands for the DPP. This level is called DPP and is accessed through the IOD level of the MAP.

DOWNLOADING:

The DPP program can be downloaded into the DPP. This function can be initiated from the DPP MAP or at the request of the DPP. A naming convention for DPP software loads has been adopted which accommodates the current AMATPS application as well as providing for future possible applications of the DPP:

DPPa9a

DPP - Specifies DPP software.

- a - The application that the software implements. 'a' will be used for AMATPS.
- 9 - The BCS. This number will wrap around every 10th BCS.
- a - The version of the software within the BCS. This letter will wrap around after reaching 'z'.

CONFIGURING DPP:

The DSI is configured as a tape drive in the DMS-100 environment. The device independent recording package (DIRP) is set up to write billing data to the DSI. More details can be found in the DIRP documentation. The DMS-100 Engineering Manual describes how to connect the DSI to the DMS-100 tape controller.

The DPP maintenance interface requires table DPP to be datafilled. The DPP table contains the hardware interface port identifiers and the name of a file containing the DPP program. Other operational parameters are specified in this table as well.

References:

TR-TSY-000003 - AMATPS Specification
BR0514 FDOC

Package	NTX243AA07 AMA TELEPROCESSING SYSTEM(AMATPS)
Feature set	MAINTENANCE
Feature	DISPLAY DPP THROUGH IOD LEVEL
Feature no	F2879

FEATURE SYNOPSIS

This feature provides for improved reliability in the reporting of DPP unit alarms. It implements display of DPP unit alarms at the IOD level of the MAP while removing the requirement of using the DPP MMI links for alarm reporting.

FEATURE DESCRIPTION

There are two types of DPP alarms: DPP maintenance port alarms and DPP unit alarms. Port alarms are reported through the IOD level of the MAP. Unit alarms are currently reported using one or both of the following methods:

- via the EXT alarm system of the DMS
- via the maintenance interface of the DPP

Both current methods have drawbacks. This feature requires the use of scan points in the same fashion as EXT to detect alarm conditions at the DPP, but the alarm conditions they represent are reported through the IOD level.

Ref: AF0151 FDOC

Package	NTX243AA07 AMA TELEPROCESSING SYSTEM(AMATPS)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	DPP ROBUSTNESS ENHANCEMENTS
Feature no	F6246

FEATURE SYNOPSIS

There are three items addressed by this feature which improve the functionality of the AMATPS maintenance interface to the DPP:

1. Increase the amount of space used for buffering DPP responses to commands issued from the DPP level of the MAP.
2. Improve the recovery of the software processes associated with a maintenance port when that port is returned to service.
3. Replace the HTDPP, RTDPP and HXDPP menu commands at the DPP level of the MAP with the more useful commands LINKTEST, CLK, and VS. The removed commands will remain in the DPP CI directory. Add the DPRTST command to the DPP CI directory so that it will be available at the DPP level of the MAP.

FEATURE DESCRIPTION

The first enhancement provides additional buffer space for processing response messages from the DPP thereby reducing the possibility of buffer overflow. When a message is received from the DPP in response to a DPP MAP level command it is stored in a buffer before being displayed on the MAP terminal. If the MAP terminal is running at a much lower baud rate than the AMATPS maintenance interface (which is 2400 baud) or if the MAP terminal has a 'MORE...' posted and is awaiting user response, then there exists a potential of overflowing the buffer. In this situation the message 'Data lost due to lack of room...' is displayed on the MAP terminal. The method of handling responses is enhanced by adding additional buffer space to accommodate the response messages.

The second enhancement focuses on the improvement of the recovery of port processes when an AMATPS maintenance interface port is returned to service from a busy state. The efficiency of these processes is improved by removing code which has been found to provide no assistance in recovering ports. Also, several routines having similar codes have been combined to provide better maintainability without sacrificing any functional capabilities.

The final enhancement replaces the menu commands HXDPP, HTDPP and RTDPP with the more commonly used commands CLK, VS and LINKTEST, respectively. The replaced commands are still available even though they do not appear on the MAP menu. Also, the DPRTST command has been added to the DPP CI directory. This command is supported by the DPP and its function is to test the dual ported random access memory (DRP) on the standby disk inter-

face circuit pack. There are no parameters required for this command and it is executed ONLY on the standby disk interface circuit pack.

Ref: DDOC AF0210

Package	NTX243AA07 AMA TELEPROCESSING SYSTEM(AMATPS)
Feature set	OPERATION
Feature	380 MBYTE DISK FOR DPP
Feature no	G0099

FEATURE SYNOPSIS

This feature sets the maximum file size for AMA, LOG and EXC files depending on the disk program in use. It also allows or disallows bad track mapping depending on the disk program in use.

FEATURE DESCRIPTION

The software queries the disk interface card for its firmware identification. The point at which AMA files are closed is then based on whether the system is using the new disk interface card firmware and 380 Mb drives, or the old firmware and 140 Mb or less drives. If the new firmware is indicated, the AMA files will be closed at or above 3855 blocks. If the old firmware is indicated, the AMA files will be closed at or above 945 blocks.

The operation of the DISK DEFMAP is also affected by the disk interface firmware type. If new, the DISK DEFMAP key is disabled. If old, the DISK DEFMAP key will function as in previous software.

Ref: FDOC AF1406

NTX244AA02 Status: A+M SEQUENTIAL TRUNK SELECTION(REP.BY NTX244

SWITCHING AND TRANSLATION	:	
SEQUENTIAL TRUNK SELECTION		F2515
SEQUENTIAL TRUNK SELECTION REALTIME IMPROVEMENTS		F3947

Package	NTX244AA02 SEQUENTIAL TRUNK SELECTION(REP.BY NTX244AB)
Feature set	SWITCHING AND TRANSLATION
Feature	SEQUENTIAL TRUNK SELECTION
Feature no	F2515

FEATURE DESCRIPTION

This feature enables data fillable selection of outgoing or two way trunk circuits on a sequential basis.

Sequential selection is required in order to minimize glare when interfacing with certain types of offices.

DMS currently provides for either most-idle or least-idle selection of idle trunks. (i.e. most-idle: the circuit that has been idle for the longest period will be selected first; least-idle: the circuit that has been idle for the shortest time will be selected first).

Sequential selection will be specified in the trunk group data as a new value for the field SELSEQ. The user will then have to datafill the specific selection order in table TRKSEL (new table). The tuples in this table will be added, with a default selection order of 0, and deleted automatically as members are added to or deleted from a group with sequential selection in table TRKMEM.

Selection order has to be in the range 0 to 2048 and except for the value 0, which has a special meaning, only one member per group may be assigned a particular value. The value 0 will mean that the trunk will not be selected for call processing and cannot be returned to service.

With this information, the system will build a map of available members from which circuits will be selected. This map will be maintained by call processing, giving it certain 'auto-correcting' capabilities. To further ensure data integrity, regular audits will be performed.

Because of data incompatibility, a trunk group's selection order may not be changed from most-idle or least-idle to sequential or from sequential to most-idle or least-idle.

The following trunk types will support sequential selection when used for outgoing traffic:

RC, DOT, DOL, MTX, ONAL, ONAT, IMT, DAL, C101, TOPS, OS, ES, T105, IS, SC, A5, P2, TDDO, T2, TO, OP, TD, OC, T101, IT, PX, IBNTO and IBNT2.

NTX244AB01 Status: RTM ENHANCED SEQUENTIAL TRUNK HUNTING(UPG OF

SWITCHING AND TRANSLATION	:	
SEQUENTIAL TRUNK SELECTION		F2515
ADMINISTRATION	:	
CIRCULAR TRUNK HUNTING		F2900
SWITCHING AND TRANSLATION	:	
SEQUENTIAL TRUNK SELECTION REALTIME IMPROVEMENTS		F3947

Package	NTX244AB01 ENHANCED SEQUENTIAL TRUNK HUNTING(UPG OF 244AA IN
Feature set	SWITCHING AND TRANSLATION
Feature	SEQUENTIAL TRUNK SELECTION
Feature no	F2515

FEATURE DESCRIPTION

This feature enables data fillable selection of outgoing or two way trunk circuits on a sequential basis.

Sequential selection is required in order to minimize glare when interfacing with certain types of offices.

DMS currently provides for either most-idle or least-idle selection of idle trunks. (i.e. most-idle: the circuit that has been idle for the longest period will be selected first; least-idle: the circuit that has been idle for the shortest time will be selected first).

Sequential selection will be specified in the trunk group data as a new value for the field SELSEQ. The user will then have to datafill the specific selection order in table TRKSEL (new table). The tuples in this table will be added, with a default selection order of 0, and deleted automatically as members are added to or deleted from a group with sequential selection in table TRKMEM.

Selection order has to be in the range 0 to 2048 and except for the value 0, which has a special meaning, only one member per group may be assigned a particular value. The value 0 will mean that the trunk will not be selected for call processing and cannot be returned to service.

With this information, the system will build a map of available members from which circuits will be selected. This map will be maintained by call processing, giving it certain 'auto-correcting' capabilities. To further ensure data integrity, regular audits will be performed.

Because of data incompatibility, a trunk group's selection order may not be changed from most-idle or least-idle to sequential or from sequential to most-idle or least-idle.

The following trunk types will support sequential selection when used for outgoing traffic:

RC, DOT, DOL, MTX, ONAL, ONAT, IMT, DAL, C101, TOPS, OS, ES, T105, IS, SC, A5, P2, TDDO, T2, TO, OP, TD, OC, T101, IT, PX, IBNTO and IBNT2.

Package	NTX244AB01 ENHANCED SEQUENTIAL TRUNK HUNTING(UPG OF 244AA IN
Feature set	ADMINISTRATION
Feature	CIRCULAR TRUNK HUNTING
Feature no	F2900

FEATURE SYNOPSIS

This feature provides a circular trunk hunting strategy that minimizes glare and killer trunks for two-waytrunk groups. It uses the last released trunk s the starting point for trunk selection.

FEATURE DESCRIPTION

The circular trunk selection strategy is based on a fixed ordered list of trunks. The two COs search the list in opposite directions. However, the trunk selected is the first idle trunk found in a search starting after the most recently released (MRR) trunk in the trunk group.

Circular trunk selection substantially reduces the impact of killer trunks. "Repeatedly seized" killer trunks are not resized as often under the circular trunk hunt (CTH), selection method as with other methods. In the CTH selection method, the selection starting point changes each time a trunk is released (the MRR trunk). Therefore, if the MRR trunk is a killer trunk, the next trunk seized would be a trunk to either side of the killer trunk.

Ref: DDOC AF0177

Package	NTX245AA01 PUERTO RICO LINE OPTION CONTROL
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ELIMINATION OF SPB, FNT AND FLAT RATE OPTIONS
Feature no	F2522

FEATURE DESCRIPTION

This feature eliminates all means of charging calls to other numbers and enforces recording of all calls. This result will be obtained by:

1. Not permitting the assignment of the Free Number Termination (FNT) option to lines.
2. Not permitting the assignment of the Special Billing Number (SPB) feature to lines.
3. Automatic assignment of the Call Detail Recording (LCDR) option to all lines. This option will not be deletable from a line.

NTX250AA12 Status: RTM DATAPATH - BASIC

FACILITIES	:	
DATAPATH - HIGH SPEED DATA UNIT		F1259
INTERWORKING	:	
SL-1 INTERWORKING		F1262
MAINTENANCE AND TESTING	:	
INTERFACE TO AND OPERATION OF DATA UNIT		F1334
MAINTENANCE	:	
TCM SYNC LOSS IDENTIFICATION		F2995
MAINTENANCE AND TESTING	:	
DATAPATH - LOOP TESTING		F3157
SIGNALING AND SUPERVISION	:	
DATAPATH - SERVICE ORDERS		F3160
DATAPATH - CALL PROCESSING		F3161
DATAPATH - SPEED CALLING		F3163
DATAPATH - AUTOMATIC LINE		F3164
DATAPATH - HUNT GROUPS		F3165
DATAPATH - ESN DIGITAL DATA CONNECTIVITY		F3166
DATAPATH - RING AGAIN		F3167
DATAPATH - DU/DLC BPV COUNT		F3169
FACILITIES	:	
DATAPATH - DATA LINE CARD		F3172
DIALING AND DIALING PLAN	:	
DATAPATH KEYBOARD DIALING		F3177
MAINTENANCE AND TESTING	:	
DU MONITOR/CO LOOPBACK		F3342
FACILITIES	:	
DATAPATH DU PROFILE		F3759
SIGNALING AND SUPERVISION	:	
DATAPATH DISCONNECT TIMEOUT		F3897
SERVICES	:	
DATAPATH SPEED RESTRICTED CALLING		F3899
INTERFACE	:	
IBM3274 DATA UNIT		F3973
IBM3278 DATA UNIT		F3974
SIGNALING AND SUPERVISION	:	
DU AUTOBAND		F3990
DATAPATH - CALL PROGRESS SIGNAL INDICATION		F5503
FACILITIES	:	
RACK MOUNT DVS (LS AND HS)		F5550
LOW SPEED DU WITH ELASTOMER KEY PAD		F5553
HIGH SPEED DU WITH ELASTOMER KEY PAD		F5554
INTEGRATED BIT ERROR RATE TESTING (IBERT)		F5693
DATAPATH MCD DATA TRANSMISSION DELAY		F6076
RACK MOUNT DU EIA CONTROLLED LP BACK		F6079
FEATURE ENHANCED HIGH SPEED DU(AP) FIRMWARE VERSION 4		F6080
MAINTENANCE	:	
BASIC BERT		F6151
MAINTENANCE AND TESTING	:	
DATAPATH MTA		F6176

SERVICES	:	
PROFILE ENHANCEMENT		F6323
MAINTENANCE AND TESTING	:	
LOCAL BUSY OUT		F6327
ADMINISTRATION	:	
DATA CALL ID ON SMDR		F6686
SERVICISS	:	
DATAPATH PROFILE ENHANCEMENTS II		F7270
HAYES KEY BOARD DIALING HIGH SPEED ENHANCEMENTS		F7271
DATAPATH	:	
DATAPATH COAX ELIMINATION FOR IBM 3194 TERMINALS		G0049

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	DATAPATH - HIGH SPEED DATA UNIT
Feature no	F1259

FEATURE SYNOPSIS

The Data Unit (DU) is a microprocessor based data set that allows a customer to connect a data terminal to a 2 wire loop. This is part of the Datapath offering to allow the customer to use the switched telephone network for data calls. In addition, two DUs may be connected "back to back" to provide a simple point to point data communications facility.

FEATURE DESCRIPTION

The DU allows connection of a data terminal to a 2 wire loop. The data terminal communicates with the DU processor via a V.35 interface. TCM technology is employed on the 2 wire loop such that the processor can map information received from the data terminal onto the 64 kbps channel. The DU communicates with the DLC located at the switch using a full duplex handshaking protocol over the 8 kbps signalling channel provided by the TCM loop.

In addition, the DU processor controls the codec/speaker interface and the instrumentation module. The codec/speaker interface provides the user with audible feedback of call progress in the way of tones and recorded announcements. The instrumentation module consists of many keys (including the dial pad) and lamps to facilitate call set up and provide visual feedback of call progress. Keys are also provided to facilitate features such as speed call, ring again and auto-dial.

A baud rate switch is provided as part of the instrumentation module which allows the originating DU to select the data rate for the call.

For the HSDU, synchronous rates of 48, 56 and 64 kbps are supported. However, due to the unavailability of clear 64 kbps channels on the switched telephone network, 56 kbps is the normal maximum rate.

Full details of the interfaces and features provided by the HSDU are provided in the referenced FDOC.

References: HSDU FDOC BF0444

Package	NTX250AA12 DATAPATH - BASIC
Feature set	INTERWORKING
Feature	SL-1 INTERWORKING
Feature no	F1262

FEATURE SYNOPSIS

A digital trunk interface facility located at the SL-1 gives it the capability to interface to T1 trunks. This allows it to connect to the DTCs of DMS/SL-100 offices, thus allowing full digital networking between SL-1 and DMS/SL-100 offices.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	MAINTENANCE AND TESTING
Feature	INTERFACE TO AND OPERATION OF DATA UNIT
Feature no	F1334

FEATURE SYNOPSIS

The Data Unit provides the data communications user with an all digital access loop to a DMS-100/IBN central office equipped with incremental software features independent of Integrated Business Network (IBN) software. Packaging of the Data Unit and associated software permits its operation by subscribers not requiring IBN.

Interface to Data Unit is via 2 wire TCM loop and digital line card (DLC) in the DMS central office.

Feature Description

Operation of Data Unit is via keys and button keypad. The following function keys are available:

- 12 button keypad
- LED status indicators for
 - . Power
 - . DTR (Data Terminal Ready)
 - . Under Test
 - . Connect
- Release key
- Volume Up key
- Volume Down key
- DN (Directory Number) key with lamp
- Ring Again key with lamp
- Speed Call key with lamp
- Network Resource key with lamp
- Mode switch
- Transmission speed select switch

Available in either low speed or high speed models, the Data Unit provides a wide range of transmission speeds:

Low Speed

300 bps - Asynch
600 bps
1.2 Kbps
2.4 Kbps
4.8 Kbps
9.6 Kbps
19.2 Kbps

High Speed

48 Kbps - Synch
56 Kbps
64 Kbps (future)

2.4 Kbps - Synch
4.8 Kbps
9.6 Kbps
19.2 Kbps

The following are some of the features supported by Data Unit:

Integrated Voice and Data

- Provides ability to use IBN features (e.g. Ring Again, Speed Call, ARS, Call-back Queuing)
- Based on Time Compression Multiplexing (TCM)
- Full duplex operation capability on 2-wire loop facility
- Uses existing building telephone cabling
- Asynch/Synch capability
- Subscriber data transparency

Technical Characteristics

- Data loop length up to 5.5 km (3.4 mi)
- Total loop loss 45 dB, including bridge taps
 - DTE interface: Low Speed - RS232C; High Speed - V35
 - Line interface - 2-wire metallic (unloaded)
 - External power supply
 - Dimensions: 31.5 x 19.0 x 5.75 cm (12.6 x 7.4 x 2.25 in)

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S631

Package	NTX250AA12 DATAPATH - BASIC
Feature set	MAINTENANCE
Feature	TCM SYNC LOSS IDENTIFICATION
Feature no	F2995

Synopsis

The TCM Sync Loss Identification feature detects faulty Datapath lines by monitoring the time compressed multiplexed (TCM) synchronization between the data line card and the data unit.

Implementation

This feature adds three new datafillable office parameters to Table OFCENG. The parameters are TCM_SYNC_THRESHOLD, TCM_SYNC_MONITOR_PERIOD, and TCM_SYNC_LINES. The feature also adds a new datafillable office parameter, TCMALARM to Table OFCVAR.

The parameter TCM_SYNC_THRESHOLD defines the number of sync losses that must occur before a Datapath line is identified as faulty. TCM_SYNC_MONITOR_PERIOD specifies how long the test will monitor each line.

TCM_SYNC_LINES specifies the number of Datapath lines being monitored.

The office parameter, TCMALARM indicates the threshold values for minor, major, and critical alarms that will be activated when too many Datapath lines are flagged as TCM sync failures.

A new CI command, TCMMON, is added at the MAP to initiate the TCM sync monitoring test. At the completion of a test, a LINE161 log is generated indicating the results. All lines identified as faulty are flagged in the Lines Test Position (LTP) level of the MAP.

The TCM sync monitoring test can be initiated on Line Equipment Numbers (LENS), line modules, or the entire office.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks (IBN) Basic
- NTX106AA IBN - Proprietary Business Set
- NTX250AA Datapath Basic
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

When a Datapath line fails the TCM sync test a TCMMON RESET command clears the flag. All other failure flags take precedence over the TCM flag. If a diagnostic passed, the flag will also be cleared.

Restrictions

TCM_SYNC_LINES specifies how many lines may be monitored at one time. The maximum value and default for this parameter is 30, but this value should be lowered if tests are performed on peripherals handling a lot of MDC traffic.

This feature does not work on DPX lines.

Reference

FDOC AC0460

Package	NTX250AA12 DATAPATH - BASIC
Feature set	MAINTENANCE AND TESTING
Feature	DATAPATH - LOOP TESTING
Feature no	F3157

FEATURE SYNOPSIS

With the introduction of Data Unit and P-phone, the line testing sub-system has been enhanced to cover three categories of lines:

- POTS
- P-phone
- Data Unit

For the Data Unit loop, a new loop testing called Data Integrity Test (DIT) has been introduced and forms part of the short and long diagnostic tests.

Feature Description

The DIT carries out the following tests:

- a) - Check loop is in sync.
- b) - Check line card relay is released, by reading line card status.
- c) - Message loop test on the DLC.

DIT is always attempted on all DATA service lines as part of the diagnostic.

The major components which constitute a DATA path are:

LCM = LINE CONCENTRATOR MODULE
DLC = DIGITAL LINE CARD
DU = DIGITAL UNIT
MLLC = MESSAGE LOOP LINE CARD
Line Card Relay Released = Then message loop at DLC
Line Card Relay Operated = Extended diagnostic only.

Line sync is the presence of regular bursts of DATA on the line, determined from the start and stop bits in each DATA burst.

Testing of the sync flag ensures that the start and stop bits on DATA bursts are checked and whether there is reasonable communication between the DLC and DU.

Data Line in Sync

If sync is okay and the message loop test on the DLC passes then the DLC is okay. If sync is true and the message loop test on the DLC fails then the DLC is assumed faulty.

Data Line not in Sync

If sync is not present and the message loop test on the DLC passes a test DU and loop status is given.

If sync is not present and the message loop test fails then the DLC is assumed faulty.

Diagnostic Failure

If the diagnostic does not pass, a loop test is run to check the facility. The presence of the Data Unit is inferred from the resistance of the loop.

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Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - SERVICE ORDERS
Feature no	F3160

FEATURE DESCRIPTION

Introduction

All existing Service Order commands will be retained to handle Data Unit lines. All existing checking will apply to Data Unit lines. Therefore, only the areas that are different from the existing S.O. methods of handling transactions will be covered.

A new line class code data will be created to distinguish Data Unit from other types of service (eg 1FR).

This LCC is used in the service order command NEW and command EST and will have its unique refinement fields to identify: custgroup, subgroup, ncos, snpa(bcs14 and after), ringing and key.

Two additional service order commands will be introduced to handle these features:

- AKO
to add features against a set key
- DKO
to delete features from a set key

Most existing commands are invisible to the users in terms of prompting and expected input. The ones that look different to the users at the MMI level are:

- NEW
- EST
- ADD

The following S.O. commands are not applicable on Data Unit lines:

- NEWDN
- OUTDN
- ADOH
- DEOH - CLN

NEW

The NEW command will be modified so that if the user wants to create a new data line, the S.O. user will specify the lcc as data for data unit as its refinement.

The NEW command will not be able to handle key features which have to be handled via the AKO commands.

AKO

This new service order command is used to add any data unit features to a set of data unit keys against a len. The len, key and option_list (a vector) are specified as input.

Checks are available to ensure that the set must be assigned with at least 1 DN before options can be assigned.

DKO

This is the opposite of AKO: to delete features from a series of Data Unit keys. The LEN , KEY and OPTION list to be deleted must be specified.

Query Commands

All query commands will adopt the existing formats. Changes are in the areas marked with an asterisk below. The information will be on the same line as follows:

- (1) QDN
- len
 - snpa
 - type of line ³
 - hunt information (if it is hunt)
 - class of service ³
 - customer group information
 - card information
 - all assigned options and features

- (2) QLEN
- dn
 - snpa
 - type of line ³
 - hunt information (if hunt)
 - class of service ³
 - customer group information
 - addon information
 - card information
 - all assigned options and features

QDN will provide the information related to the DN only, whereas QLEN will provide the information related to the primary DN plus all keys and their directory numbers associated. This information will provide :

- a list of keys and their associated features
- a list of keys and their associated directory numbers

QDN on a madn line will provide

- information associated with the primary madn member only (eg options, len info)
- a list of all the madn members

All other query commands will remain unchanged.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - CALL PROCESSING
Feature no	F3161

FEATURE SYNOPSIS

The DU subscriber sets up a call in much the same way as a P-phone user would. The differences relate mainly to:

- 1) The DU can only receive and not transmit voice.
- 2) The extra functions on the DU related to the RS-232 interface.

Feature Description

a) Origination

An origination is not allowed unless the DTE's DTR lead is on. The user will be sent to "DOT" treatment (deny origination data terminal) and the DN lamp will be turned on. The user must then drop the call with the RLS key.

If the auto orig dipswitch is in the "on" position then the DTE may raise its DTR lead to cause an origination. The call will then proceed as if the DN key had been pressed. This will be used mainly when the DU is set up to route directly to a fixed DN (automatic line feature: 'AUL').

If the origination attempt is successful then dial tone will be heard through the speaker and the DN lamp will be set to steady on. The user may then proceed to dial. Digits keyed before this time will be ignored.

The DU will route to "PDIL" (partial dial) treatment or "PSIG" (permanent signal) treatment in the normal manner if the user does not dial after receiving dial tone. The DU will be idled instead of being put in "PLO" state if "lKout" appears in the route list associated with the treatment given. No DU should ever appear in "PLO" state in the LTP.

b) Digit Collection

Digits will be collected and translated using the full IBN translation. The digit '#' can be used to indicate end of digits but is not required. See feature Datapath-ESN Digital Connectivity for datapath translation.

c) Call Connection

If the call attempt is successful the user will hear audible ring until the call is answered. The connect lamp should go on at this time (i.e. a connection to another DU has been made). If the connect lamp does not go on the probable cause is:

- 1) the far end is not a DU
- 2) the call has been routed through an analog trunk without a modem
- 3) table LNINV has not been datafilled with NPDGRP and digital loss is being inserted (see data schema)
- 4) an echo suppressor is being used

Other DU's, announcements, tones, and digital trunks are valid terminations for a DU. Operators, analog trunks (without the modem pool feature), and regular 1FR subscribers are not. The DMS-100 translation tables should be set up so that such terminations are screened for both intra-office and inter-office calls.

d) Termination and Answer

Ringling tone will be heard through the DU speaker, the DN lamp will flash (60 IPM), and the RS-232 RI lead will be toggled at a 2 sec. on - 4 sec. off cycle.

A depression of the DN key will always be considered a valid answer provided the DTE's DTR lead is on. The connect lamp should come on shortly afterwards. This indicates that a DU to DU connection has been made. If an attempt to answer without DTR is made the DN lamp will be set winking (120 IPM). The call may still be answered once the DTR lead is brought up.

If the DU has its auto answer dipswitch set to the "on" position then the RS-232 DTR lead may also be used to answer an incoming call. The call is answered immediately after the DTR is found to be on.

e) Disconnect

A disconnect consists of a manual depression of the RLS key or of a transition of the DTR lead from on to off. This applies to both manual and auto answer DU's. If only one end of a DU to DU call abandons then the other end will be taken down when the telephony onhook is mapped through the telephony network.

f) DU to DLC Synchronization

A loss of sync between the DU and the data line card (DLC) during a call will result in call take down when it is discovered by the Keyset audit. A log message will be generated and the CC state of the line will be updated to reflect the loss of sync. A loss of sync may be caused by:

- 1) a hardware fault or cable cut
- 2) loss of power to the DU (i.e. plug pulled from wall)
- 3) a self test of the DU (initiated by the self test dipswitch)

g) Baud Rate Setting

The user has complete control over the baud rate setting. It cannot be set from the DMS machine. The baud rate of the originating DU will be passed across to the terminating DU when synchronization is first established. This is done using the KHP end to end signalling protocol. This baud rate will be used at both ends, regardless of the position of the baud rate selector on the terminating DU.

Basic CC call processing will not monitor the baud rate setting or take any actions based on it.

h) Translation and Billing

No new translation tables or billing software has been added. Calls routed to a termination not allowed for DU should be routed to a special office route with a tone or announcement of the Telco's choice.

RFF 161

P. Sils

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - SPEED CALLING
Feature no	F3163

FEATURE DESCRIPTION

DATAPATH - SPEED CALLING

The Speed Calling (SC) feature allows a subscriber to call a frequently dialed number on a previously designated list via a short digit code rather than the complete set of digits.

A prime directory number (PDN) must exist before the SC feature can be assigned to the set. Each set may have one speed call short list (SCS), up to 10 entries and/or one speed call long list (SCL) up to 30, 50, or 70 entries. The set may also belong to a speed call user group (SCU), a list of up to 70 speed call numbers is then available to him but they may only be programmed by the set that is assigned the speed call long list.

The description of the code access is found in the feature description of the IBN Speed Calling feature. Only the SC feature key will be described here.

A Data Unit may have only one Speed Calling key.

The digits may represent a DN, account or authorization code. Due to this variety, only during feature use may the SC value be validated.

Like other Custom Calling Features, SC is assigned and deleted via the Service Order System.

A Speed Call Group is defined as a number of users able to access one SC long list. Only one user in the group, the controller, is able to alter the contents of the list.

A SC list can be updated only when the Data Unit is in the idle state.

The customer filled SC lists are accessible and modifiable by the TELCO. If the office has the Journal File option, then a Journal File record is kept of each update to a SClist.

No checks will be made to prevent a user from attempting to use a Group Speed Calling List while the lists controller is updating the list. The number may or may not be valid.

Note: Data Unit Speed Calling will use existing IBN software, therefore

it is not compatible with POTS.

Speed Calling Usage

To activate the SC feature, the subscriber depresses the DN key, receives dial tone and will then depress the SC key (or '3'). The lamp associated with the feature key is turned ON. Normal call progress tones will not be heard. The user will then key in the SC code corresponding to the type of list it possesses (short, long, user).

If the stored number is a partial dial DN, a dial tone is returned prompting the user to enter the remaining digits.

Speed Call Programming

To program the SC feature, the Data Unit must not be active on the channel, where active defines the dialing, listening to tone or talking state.

To store a value against a SC code the sequence is as follows:

- 1) The user depresses the SC key.
- 2) The SC lamp flashes at 60 impulses per minute (IPM).
- 3) The subscriber then enters the desired SC code followed by the DN to be assigned.

To end the storing sequence the SC key is depressed for a second time. The SC lamp is turned OFF. No confirmation tone is sent when programming with the SC key whereas one is sent for code access.

Whenever digit(s) are stored against a SC code the initial contents are overwritten.

The procedure to nil out the contents of a SC code is the same as programming a SC code; ie no digits are entered and the subscriber must enter a '#', followed by a SC key stroke.

An '#' might be interpreted as a 'last digit message', thus indicating the end of digit entry. However, nothing is updated until the second SC key depression.

The '#' is never stored, it is simply used as an end of input symbol.

Should a SC code have its contents deleted, which were initially nil, the programming will still be considered valid. The SC lamp will be turned off, on the second key depression. If the SC code access was used, the user will hear Confirmation tone.

During programming, special dial tone is emitted after the programming SC code is entered. This only applies for the code access case only.

Call restrictions may be enforced when a call is placed, ie. toll restrictions.

Feature Restrictions

The Speed Call number cannot be updated while the line is busy on a call.

DMS-100 does not support cut-through dialing at this time. Therefore pause insertion is not needed. Asterisks cannot be inserted to serve as timed pauses. This may be a future feature capability.

The Speed Calling feature can not be assigned to a DU with the Automatic Line (AUL) feature. This is a Service Order check.

The Speed Calling key feature can only be assigned to key '4' of a DU. This is a Service Order check.

Each DU can only have one Speed Call key, and only one type of SC can be assigned to that key. However, the other types of SC can be assigned using the feature access code.

A user can not start SC programming using the feature access code and end programming using the SC key. A user can not start SC programming using the SC key and end programming using the '#'.

Datapath/IBN Differences

1. For feature activation the LGC will report after 1 digit for SCS and 2 digits for SCL or SCU and not wait for interdigit timeout as in the 2500 set case.

2. For the 2500 set case keying a # during a program sequence will result in the digits being reported and the programming sequence terminates. For Datapath it will result in further digits being ignored (not stored) but will wait for the second depression of the speed call key before reporting digits. The # will be included in the digit report.

3. No interdigit timing is done for programming in Datapath (key access case) but a long timer is maintained to prevent the set from remaining in a program sequence indefinitely.

4. For key activation the lamp states are used as indicators, no tones are used in programming.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - AUTOMATIC LINE
Feature no	F3164

FEATURE DESCRIPTION

DESCRIPTION -

When an off-hook is reported and AUL (Automatic Line) is assigned, a connection is made to a predetermined location. The off-hook is achieved by the user depressing the DN key (in manual mode), or when Data Terminal Ready (DTR) goes high on the Data Unit (dip switch set to automatic origination). The terminating location's directory number is entered via service orders. This predetermined location can be served by DMS-100 or it can involve outpulsing. The stored number can be from 1 to 15 digits in length.

FEATURE RESTRICTIONS

1. The stored number must be digits, the ' ' and '#' are not allowed.
2. AUL can not be assigned to a DU that has the Speed Calling feature. This is a Service Order check.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - HUNT GROUPS
Feature no	F3165

FEATURE DESCRIPTION

Datapath will only support Directory Number Hunting (DNH). The Datapath hunting feature will function the same way as the DNH feature for POTS and IBN.

Each member in the hunt group has it's own unique directory number (DN). The hunt group can be accessed by dialling the main number (Called Pilot DN) or by dialling the DN of one of the hunt group members. Hunting starts at the number dialled. The number of members hunted to find an idle member is dependent on the hunting option assigned to the DNH group.

The following features can be assigned to DNH groups:

Circular Hunting (CIR):

If option CIR (Circular hunting) is assigned to the group, all members in the hunt group will be hunted regardless of the start point of hunting. If CIR is not assigned, the default is Sequential hunting (sometimes called Linear hunting). Sequential hunting starts at the number dialled and ends at the last number in the hunt group. Therefore, if the Pilot DN was not dialled, not all members will be hunted.

Line Overflow to a Route (LOR) If all the members in a hunt group are busy, feature LOR causes hunting to continue to a specified route index.

Line Hunt Overflow to a Directory Number (LOD) This is sometimes called Secretarial Hunt. If all the members in a hunt group are busy, feature LOD causes hunting to continue to a specified directory number. This DN can be part of a hunt group.

If any of the above features are assigned and the hunt group is busy the caller hears busy tone.

Bridged Night Number (BNN):

Bridged Night Number (BNN) can be assigned to DNH groups. This feature permits the customer to advertise a different number for night service without requiring a third wire. Scan points are not required.

For example, the customer may advertise that a different DN is to be dialled after 5:00 p.m. If the daytime DN is dialled, hunting as specified for the group will apply. If the BNN is dialled, the BNN will be rung. BNN involves the double assignment of LEN (Line Equipment Number).

Several BNN can be assigned, on an individual line basis, to a main hunt group. If required, hunting can take place among the BNN. If the BNN form a hunt group, hunting is sequential unless option CIR is assigned to the BNN group.

All of the preceding are standard DMS POTS hunting features which will be available in Datapath.

Feature Guidelines:

DNH should not be assigned to hunt groups which consist of more than approximately 15 members. These are recommended guidelines.

A hunt group can consist of 256 members.

At present, DMS supports 8,192 hunt groups and a total of 32,767 hunt members per switch.

The Pilot DN and the hunt group members must belong to the same Customer Group. The LOD number can, however, be outside the customer group.

Feature Activation/Deactivation:

Lines, hunting, options and features are assigned and removed via the Service Order System. Changes are made via this same system.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - ESN DIGITAL DATA CONNECTIVITY
Feature no	F3166

FEATURE DESCRIPTION

Background Datapath provides switched data service to a customer equipped with a Data Unit (DU). A DU is an RS-232 digital modem with telephony functions included in the same unit. A Datapath customer with a DU has the capability to transmit digital data at a range of 300 to 19.2 BAUD asynchronous or 1200 BAUD to 56 Kbps synchronous.

The DU uses an internal proprietary signaling protocol to transmit and receive data. This protocol can only be processed over digital facilities. Hence, the reason for a Digital Connectivity feature.

Requirements for a Digital Data Call The following conditions shall be imposed on direct digital data connections to ensure clear channel data transmission.

1. End-to-end digital connections shall be provided, i.e. digital switches and digital facilities must be selected for the connections.

This can be accomplished through translation and routing for data calls. Digital data network calls should not be rerouted or hop off on to the Public network, unless digital data connectivity can be guaranteed.

It must be made clear that when a switch routes a data call out on a digital trunk, the trunk can not be connected to a digital channel bank.

2. Digital pads shall be switched out or set to zero.

The digital trunks to be used by digital data must also have the pad group set to zero in both directions. This is normally not a problem for TOLL trunks since they are usually set to zero anyways. Since the DU will have a nil pad group value, the originating and terminating ends to the call will be set to zero.

3. Echo suppressors or cancellors shall not be used.

The type of network the customer has will determine how these devices will be controlled. If the devices can

not be disabled by software then segregated digital trunk groups will be required.

Numbering Plan

The DMS-100 has the capability to manipulate the outpulsed digits to provide whatever digits that are required for a Datapath public network numbering plan.

It is recommended that the numbering plan use segregated digital trunk groups for long haul trunks and shared trunk groups for short haul trunks. The long haul trunks are not equipped with echo suppressors and therefore can not be used for voice calls. Both voice and data can share the short haul trunks since echo suppressors are not used for these types of trunks. By having voice and data over the same digital trunks the telcos can better utilize their digital facilities.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - RING AGAIN
Feature no	F3167

FEATURE DESCRIPTION

Description

Ring Again allows a Data Unit user, on encountering a busy Data unit (DU), to have the system monitor the called Data unit, and when it becomes free, alert the calling DU user and ring the called Data unit.

This feature only applies if both the originating and terminating Data Units are served by the same DMS-100. Both Data units must belong to the same customer group.

Feature Use

Activation:

A Data unit user, upon encountering a busy Data unit (DU), will depress the Ring Again key. This will turn on the Ring Again lamp and turn off the DN lamp, if the Ring Again request is valid. The DU user may make other calls.

RAG Recall:

When the busy DU becomes idle the Ring Again lamp will wink and a notification tone will sound. To answer the RAG recall, the user must first depress the DN key and then depress the Ring Again key. The previously busy party will now be rung. The Ring Again lamp will go out.

The DU user has X seconds to respond to the RAG recall, where X can be from 8 to 30 seconds. The RAG recall timer, called RAGTIME, is defined at the customer group level and is settable in 1 second increments. It is started when the DU user is notified that the busy DU has become idle.

If the RAG called DU goes off-hook:

1. while the DU user is being notified
2. before the DU user answers and the RAG timer has not expired

If the DU user then answers, by depressing the DN and Ring Again keys, the user will hear busy tone. This will tell the DU user that during the notification period the called DU became busy again. The user may activate the RAG feature again by depressing the RAG key.

If the DU user and the RAG called Data unit "simultaneously" go off-hook (DU user depresses the DN key and RAG key to answer the RAG recall; the RAG called DU depresses the DN key to originate), a network connection will be made between them. However, if a glare condition occurs, the DU user will hear reorder. This RAG request is cancelled and the next RAG requestor will receive RAG recall ringing.

If the RAG timer expires and:

1. The RAG called Data unit is still idle
2. DU user has not responded

the RAG request will be removed from the RAG system and the RAG key lamp will be turned off.

Deactivation:

The user can cancel the Ring Again request at anytime except during RAG recall. Ring Again cancelation will not be allowed during RAG recall (lamp is winking), to eliminate lost RAG requests that would occur if the user forgets to depress the DN key before depressing the Ring Again key.

DMS-100 will also delete the RAG request if any of the following occur:

1. The RAG request is successfully completed (both parties transmitting data)
2. DU user responds to the RAG recall tone, the called Data unit may or may not be idle. The called DU may or may not answer if rung.
3. DU user does not respond to the recall. The RAG timer expires. The called Data unit has not been rung.
4. DU user's line is removed from service.
5. RAG feature is deleted from the DU user's line
6. RAG called Data unit's line is removed from service
7. The contents of the RAG data become corrupted.

Service RAG Requests:

DMS-100 will attempt to serve the pending request when called DU becomes idle.

Each DU user can only have 1 RAG request pending. However, there can be a number of user's with requests for 1 DU.

Audit:

An audit is required to ensure the called DU is returned to the idle state once no further RAG requests are pending for the called DU. s.p 2 FEATURE INTERACTION:

Originating Data Unit:

1. The DU must be assigned RAG. RAG will be assigned and deleted from lines via the Service Order System.
2. RAG cannot be assigned to Automatic or Manual lines. It cannot be assigned to lines denied originating or terminating service.
3. RAG cannot be assigned to hunt groups (DNH, MLH or DLH). This is a Service Order check.
4. The RAG feature must be assigned to key '7' of the Data Unit. This is a Service Order check.
5. The following assumes the calling DU already has a RAG request pending. If the calling DU dials another DU which is also busy, to make a RAG request on the last called DU the user must:
 - first depress the RAG key to cancel the first RAG request
 - depress the RAG key a second time to activate a new RAG request

Terminating Data Unit:

The following discusses interaction which affects the calling DU's ability to activate RAG and conditions that must apply to the called DU before the calling DU is alerted to RAG recall.

1. The called DU must be idle (on-hook) before the calling DU is alerted.
2. The calling DU cannot activate RAG if the called DU has been made busy to new calls while another DU is receiving RAG recall. During the RAG recall interval, other calling DUs cannot activate RAG on the called DU.

If any of the above apply when the calling DU attempts to activate RAG, the Ring Again lamp will not be turned on.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - DU/DLC BPV COUNT
Feature no	F3169

FEATURE SYNOPSIS

This feature allows maintenance personnel to instruct a data line card to autonomously report a bipolar violation count whenever a predefined threshold is exceeded and to present this information on request.

FEATURE DESCRIPTION

The data line card (DLC) is connected to a Data Unit (DU) by a Time Compression Multiplex (TCM) loop and bipolar coding is used. The number of bipolar violations (BPV) is a measure of the bit error rate of the loop and can be used by maintenance personnel as an early warning of possible service degradation. (Note that because of inherent error detection and correction in the data transfer protocol, the customer perceived error rate may not be affected.)

This feature allows maintenance personnel to enable DLCs to report BPVO (BPV overflow, ie, when the BPV exceeds a threshold) in their associated data loops. This reporting may be done on a posted data line or a 'posted set' of data lines. To select autonomous BPVO thresholding, a BPVO threshold command is sent to the DLC. Under control of the DLC micro, the TCM chip counts the BPV. The DLC micro examines the BPV count over a time interval of 4.6 mins and autonomously reports every time interval that the selected threshold has been exceeded.

The feature is implemented by adding to the MAP a BPVO command which has the following four options:

BPVO START - to enable the DLC to autonomously report BPVO and to define one of three thresholds. This command can be executed on all or one data line.

BPVO QUERY - to request BPVO information for a single or set of posted data line(s). A 'count' value can be specified and only lines whose BPVO count has exceeded the value will be displayed.

BPVO STOP - to disable BPVO reporting.

BPVO RESET - to set the BPVO counters for all data lines in the office to zero.

This feature has little impact on real time as it is run at maintenance priority.

References

FDOC BC0732

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	DATAPATH - DATA LINE CARD
Feature no	F3172

FEATURE SYNOPSIS

The basic function of the DLC is to interface the Data Unit (DU) to the switch (DMS/SL-100) as part of the Datapath offering.

FEATURE DESCRIPTION

The DLC resides in the line drawer of the LCM and provides the interface function between the DU and the switch.

Communication between the DLC and the DU is realised by employing TCM technology over a 2-wire loop. This provides a bidirectional exchange of two framing bits, eight signalling bits and sixty-four data bits within each 1 ms frame. The signalling channel is used to effect a full duplex handshaking protocol between the DLC and the DU.

Communication between the DLC and LCM is effected via the bus interface card (BIC). Two signalling protocols are supported, consisting of a single byte control protocol and a four byte message protocol.

The DLC consists of three basic components; the loop interface circuit, the TCM LSI circuit and the microcomputer. The 64 kbps data channel is provided between the LCM and DU via the TCM LSI and loop interface circuits, whilst signalling both to and from the DLC is handled by the microcomputer which connects directly to the TCM LSI circuit by an internal data bus.

References: DLC FDOC BF0443

Package	NTX250AA12 DATAPATH - BASIC
Feature set	DIALING AND DIALING PLAN
Feature	DATAPATH KEYBOARD DIALING
Feature no	F3177

FEATURE SYNOPSIS

This feature enables users to establish data calls using the terminal keyboard rather than the keypad of the Data Unit (DU). Keyboard dialing (KBD) also supports most of the major calling features such as speed call, ring again, etc.

FEATURE DESCRIPTION

The KBD firmware routine resides in the DU (or the asynchronous interface line card) and performs a simple emulation of the DU keypad for asynchronous ASCII data terminating equipment. All features activated by the keypad are supported by KBD in the same way and these include:

- basic calling
- speed calling
- autodial
- network resource selection
- ring again
- automatic answer
- autodial number update
- speed call update
- ring again cancellation
- loopback operation

To activate KBD, the user powers his terminal and places it online, selects the operating speed or autobauds whereupon a prompt is received. The characters used to invoke the above features and the prompts returned by KBD are published in the appropriate user guide. KBD remains active during call connection and becomes inoperative once the data call is established.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	MAINTENANCE AND TESTING
Feature	DU MONITOR/CO LOOPBACK
Feature no	F3342

FEATURE SYNOPSIS

The DU monitor feature allows tests to be performed on DU's and on the lines associated with those DU's. Use of this feature allows external test equipment to be connected to a DU and allows monitoring of any data call on the switch to aid in solving customer protocol problems.

The CO loopback feature allows data transmission testing (continuity and error rate) at the subscribers premises by looping around the DU transmit and receive paths at the CO. This loopback is activated by dialling a special code at the subscriber premises.

FEATURE DESCRIPTION

The DU monitor feature is realised by three new commands in the LTPMAN level of the MAP; EQUIP, CONNECT and LOOPBACK.

The EQUIP command is used to reserve specified equipment for use with the CONNECT command. By using the EQUIP command, a monitor and a test-line can be reserved exclusively for the use of the MAP which issued the command. This equipment is released when the user issues a release command, when the user leaves the LTP level of the MAP or when the user logs off. The EQUIP functions are an extension of the TTU and LTU procedures currently employed at the MAP.

The CONNECT command allows a specified line to be connected to a posted line with or without a MONITOR connection. Without the MONITOR option, a specified DU can be connected to any other DU on the same switch. This allows external test equipment such as a bit error rate tester to be connected to the line. With the MONITOR option, the CONNECT command connects two DU's together along with previously reserved monitoring equipment. In this case, monitor DU's may be attached to the transmit path, receive path or both paths of the connection under test. The monitor DU's require only their receive paths connected to the call being monitored. Whilst the CONNECT command is in operation, all key depressions from the connected DU's are ignored.

The LOOPBACK command is used to activate a loopback point on the currently posted line such that test messages may be sent from the switch and returned to the switch. Loopback points exist at the line card (an analogue loopback on the line side), at the DU RS232C interface at the DU 64 kb/s interface and at the remote DU to which the posted DU is connected.

The above commands are realised by three menu positions at the LTPMAN level of the MAP. The syntax of each of the above commands is described in the FDOC. Although some call processing may in future be done over trunks for remote testing purposes, the MMI should not change.

As each command is entirely optional, they will appear in the LTPMAN level of the MAP only if the data option is included in the load. No log reports are affected as none are output by this feature.

DU line continuity testing and bit error rate testing may be performed at the subscribers premises when the transmit and receive paths of the line are looped together at the CO. This is done by dialling from the subscribers premises a special access code which automatically initiates the loopback. This loopback condition then persists until the subscriber releases the call by going on hook. Sufficient checks must be performed to ensure that an ordinary voice line cannot invoke this feature. The access code which invokes this feature is datafillable in table IBNXLA and loopback is limited to those lines with translator name DUXL, which is held in CUSTHEAD or NCOS. For DU's with loopback, a unique NCOS and feature translator are datafillable in the table NCOS.

The loopback is initiated from the DU using normal call origination procedures and these are described in FDOC V0921. When the "DN" lamp is steady on, indicating proceed to send, the access code is keyed in. As soon as the code is entered, the loopback feature is activated and the "connect" lamp becomes steady on. If the line is posted at the MAP, it will show as being connected to itself. If the loopback cannot be set up properly, re-order tone is returned to the DU.

Once the loopback state is entered, it persists until the usual call disconnect procedure is started (the user presses the release key or the DTE sets the DTR lead low).

DU CO loopback is implemented using the feature processing environment (FPE) as an originating dial feature. The actual feature processing routines appear in a new module, FTRLOOP, within subsystem DATAPATH, and further details are included in FDOC V0902.

Changes to the data schema are necessary in that table IBNXLA must hold the value for the loopback access code. This feature has no impact on any other features or on real time.

References

FDOC V0921 Data Unit Call Processing
FDOC V0902 Data Unit CO Loopback
NTP 297-2101-451 Customer Data Schema
FDOC V0899 Data Unit Monitor
DMS-100 Family Technical Specification

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	DATAPATH DU PROFILE
Feature no	F3759

FEATURE SYNOPSIS

The Data Unit (DU) is a microprocessor based data set that allows a customer to connect a data terminal to a two wire loop. This is part of the Datapath offering to allow the use of the switched telephone network for data calls. The Datapath DU profile feature defines a datafillable table, resident in the switch, which contains parameters that characterize the DU. This profile may be downloaded from the switch to the DU in order to control the operating characteristics of the DU.

FEATURE DESCRIPTION

The DU profile is a datafillable table containing DU operating parameters such as class of DU, data rate, synchronous/asynchronous, etc. The data is captured from service order input or from table control input, such that the DU operating parameters can be input at the MAP. When the data line is returned to service, the profile is downloaded to the DU and to its Data Line Card (DLC). The DLC stores the profile and injects it into the DU on each TCM (time compression multiplex) synchronisation lost to found transition. This is required such that the profile, which is maintained in DU volatile RAM, is downloaded after the DU is powered up after a power down period. Changes can be made to an existing profile by firstly manually busying the line, secondly making the service order/table control changes and finally returning the line to service.

In addition to providing the data for downloading, the profile may also be used by Datapath call processing and maintenance software for feature reference and information. Also, the DU profile may allow the capture of data from dynamic DU input, ie, the user may change his operating parameters, which can then be uploaded to the switch to update the DU profile.

Other than changes to the service order and table control commands, this feature has no impact on the system; rather, it will be used to enable other features to be implemented.

References

FDOC BV1309

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH DISCONNECT TIMEOUT
Feature no	F3897

FEATURE SYNOPSIS

This feature required for security reasons and assignable on a per line basis holds a terminating data unit line in the unavailable state after call take down for a datafillable disconnect time.

FEATURE DESCRIPTION

Datapath provides switch data service to a customer equipped with a data unit (DU). The DUs can be interfaced to terminals, mainframes, printers, front end communications processors, and a multitude of other devices.

Some devices take a significant amount of time to clear a call in their software i.e., the disassociation between the application task and a communication port is not done immediately after call take down. Because of this delay, it is possible for an immediate subsequent call to that port to gain direct access to the application task which is still associated with that port. This is a serious security loophole since the caller bypasses all password checking and gains unauthorized access to the application.

The disconnect time out feature, assignable on a per line basis, operates by holding the line in the unavailable state for a specified time out giving the connecting devices time to take down their communication port thus removing the security loophole.

If both DUs in a call have the disconnect timeout feature, the one which released the call is idled immediately, and the other goes through the disconnect timeout. The DU undergoing the disconnect timeout treatment will be able to cancel it by pressing the release key. However, if the call is cleared due to an error condition, (e.g., loss of TCM sync on the loop) both DUs will go through disconnect timeout which each may cancel by releasing the call.

The disconnect timeout option is assignable on a per line basis and the disconnect timeout value is a datafillable office parameter with a maximum value of 600 seconds and a default value of 15 seconds.

Ref: FDOC BV1310

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SERVICES
Feature	DATAPATH SPEED RESTRICTED CALLING
Feature no	F3899

FEATURE SYNOPSIS

This feature is optional on a per line basis and allows the telco to restrict the originating speed of data units which are set to a higher speed than stored in their profile as required in the Canadian market.

FEATURE DESCRIPTION

This feature will allow the telco to specify an upper limit to the speed, or data rate, of the originating data unit for the following data path products:

Feature enhanced low and high speed data units (LSDU, HSDU), The asynchronous interface line card (AILC) and the data above voice line card (DAVLC). These products may operate at speeds up to 56 kbps synchronously and 19.2 kbps asynchronously. Data units have a baud rate switch to select various operating speeds whilst asynchronous interface line cards (AILC) and data above voice line cards (DAVLC) are capable of autobauding to change their operating speed.

This feature is invoked by data filling the data unit profile and on return to service, the DU will be configured (via profile downloading) with the feature information.

Reference:

FDOC BV1317

Package	NTX250AA12 DATAPATH - BASIC
Feature set	INTERFACE
Feature	IBM3274 DATA UNIT
Feature no	F3973

FEATURE SYNOPSIS

The function of the coax eliminator data unit system is to replace a dedicated IBM 3270 type A coax link with a two-wire loop, allowing for both back-to-back or DMS/SL-100 circuit switched operation. To accomplish this task, two separate data units are needed: one to interface to an IBM 3278 terminal called the Terminal Interface (TIF), and one to interface to an IB 3274 control unit called the Control Unit Interface (CUIF). This feature is for the CUIF.

FEATURE DESCRIPTION

The CUIF is based on the Intel 8031 microcomputer and uses Time Compression Multiplexing (TCM) technology to convert the coax interface to the two-wire loop.

The TCM circuit provides a clear full duplex 64 kbps data channel and an 8 kbps signalling channel. The 64 kbps channel is used for sending IB session information embedded within an HDLC protocol running synchronously at a rate of 56 kbps. The 8 kbps channel is used for messaging between the data unit and the DMS/SL-100 switch.

The CUIF is compatible with IBM 3274 and 7276 type control units. The CUIF is packaged as a rack-mount unit and receives power from the shelf backplane. Hence, it has no keypad or feature keys. The BNC coax connector to the control unit and the two-wire loop connection are located at the back of the shelf. The CUIF is an answer only device that automatically answers all incoming calls.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DU AUTOBAND
Feature no	F3990

FEATURE SYNOPSIS

Autobauding is a feature that allows the data unit (DU) to determine the data rate and parity selection of a user's terminal (DTE) for asynchronous operation.

FEATURE DESCRIPTION

Autobauding is invoked when the DU is powered on, or following the inactive to active transitions of the DTE. The actual process of autobauding requires that the DTE send an ASCII period (.) character, followed by an ASCII carriage return character to the DU, generally as a result of the user pressing the corresponding keys on the terminal keyboard. Based on the characteristics of the serial data received from the DTE, the DU can estimate the data rate and parity choice and use this information to configure itself to match the DTE.

The user is not notified when autobauding is invoked, since the DU cannot transmit any messages to the DTE until autobauding is complete. The specific asynchronous data rates supported are: 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, and 19200 bps. The DTE must operate at one of these rates for autobauding to succeed.

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SIGNALING AND SUPERVISION
Feature	DATAPATH - CALL PROGRESS SIGNAL INDICATION
Feature no	F5503

FEATURE SYNOPSIS

This feature enhances the user interface for datapath products by providing call progress signal indications via the signalling channel to the users equipment.

FEATURE DESCRIPTION

Datapath is a circuit switched data service provided by the DMS-100 and a variety of customer premises equipment (CPE) is available. Some of the CPE provides a speaker which delivers call progress tones to the user. Other CPE (such as the data above voice subscriber access multiplexer, the asynchronous interface module, the coaxial eliminator data unit) do not have speakers and use the keyboard dialling feature for call set up, release and feature activation.

This feature consists of two entities; a CO software feature and a CPE (or line card) firmware feature. The CO feature monitors the progress of a data call through the system and generates messages (busy, reorder) which are transmitted towards the CPE. The firmware feature is additional to the keyboard dialling feature and may reside in the CPE or line card depending on the type of unit. The firmware receives the call progress messages sent by the system and displays them on the users terminal as character prompts. The user is therefore informed of call status in the absence of a speaker unit.

References:

Datapath Keyboard Dialling F3177
BNR FDOCs - Call Progress Signalling BC1597
- Call Progress Display/Usage BF0691

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	RACK MOUNT DVS (LS AND HS)
Feature no	F5550

FEATURE SYNOPSIS

This feature provides a rack mounted low speed data unit and a high speed data unit.

FEATURE DESCRIPTION

The rack mounted high speed data unit and rack mounted low speed data unit functionally replace the high and low speed data units in applications which require a high concentration of data circuits. The data units consist of single printed circuit board designed to fit into the datapath rack mount shelf. The key pad has been removed, resulting in the ability to originate calls only if auto originate is turned on.

Incoming calls are answered if auto answer is enabled. The speaker, CODEC/ filter, and amplifier have also been removed. Self-test, busyng out the data unit and loop back control are also provided.

Standard data unit baud rates are supported.

Ref:

BF0795
BF0796

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	LOW SPEED DU WITH ELASTOMER KEY PAD
Feature no	F5553

FEATURE SYNOPSIS

The feature enhanced low speed data unit has been equipped with an enhanced keypad along with two new keys (SETTINGS and ALTERNATE) and an array of LED indicators.

These changes enhance the user interface by permitting the operating parameters to be set from the keypad. The LED indicators display the currently selected parameter and baud rate of the data unit.

FEATURE DESCRIPTION

An enhanced keypad has been equipped with the enhanced low speed data unit to facilitate the setting of the operational parameters. This eliminates the need for the rotary baud rate switch and the two DIP switch packages.

A new key called SETTINGS is used to enter and exit the setup mode. When the SETTINGS key is pressed and the LED beside the SETTINGS key flashes, the data unit is in the setup mode. Changes to the operating parameters can then be made with the use of the keypad. Pressing the SETTINGS key again will then take the data unit out of the setup mode.

The second new key called ALTERNATE is used to select the profile of operational parameters to be displayed by the LED indicators - either the group of parameters called the primary parameters or the group called alternate parameters.

Ref: BF0797

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	HIGH SPEED DU WITH ELASTOMER KEY PAD
Feature no	F5554

FEATURE SYNOPSIS

The feature enhanced high speed data unit has been equipped with an enhanced keypad along with two new keys (SETTINGS and ALTERNATE) and an array of LED indicators.

These changes enhance the user interface by permitting the operating parameters to be set from the keypad. The LED indicators display the currently selected parameters and baud rate of the data unit.

FEATURE DESCRIPTION

An enhanced keypad has been equipped with the enhanced high speed data unit to facilitate the setting of the operational parameters. This eliminates the need for the rotary baud rate switch and the two DIP switch packages.

A new key called SETTINGS is used to enter and exist the setup mode. When the SETTINGS key is pressed and the LED beside the SETTINGS key flashes, the data unit is in the set up mode. Changes to the operating parameters can then be made with the use of the keypad. Pressing the SETTINGS key again will then take the data unit out of the set up mode.

The second new key called ALTERNATE is used to select the profile of operational parameters to be displayed by the LED indicators - either the group of parameters called the primary parameters or the group called alternate parameters.

Ref: BF0798

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	INTEGRATED BIT ERROR RATE TESTING (IBERT)
Feature no	F5693

FEATURE SYNOPSIS

This feature provides a means to perform integrated bit error rate testing (IBERT) for maintaining datapath products.

FEATURE DESCRIPTION

This feature in conjunction with datapath maintenance software, provides the DMS craftsperson with the ability monitor and diagnose from the maintenance and administration position (MAP), the data transmission quality of a selected datapath line. The method performed is integrated because external test sets which are inaccessible from the MAP and not within the DMS/SL-100 maintenance process are not required.

The IBERT is also used for the datapath extension system (DPX) based on the DE-4E channel bank, providing maintenance for the DPX.

The IBERT resides in a line drawer of a line concentrating module (LCM) or remote line concentrating module (RLCM) and occupies the space of two line cards. The IBERT does not have a sec or line associated with it.

To perform tests, the craftsperson would post the desired data unit, operate the desired loopback, and issue the appropriate command to start the bit error rate test. Testing is performed in accordance with the CCITT recommendation V.52 using a pseudo-random pattern of 511 bits at data rates from 50 bps to 19.2 kbps asynchronous and from 1.2 kbps to 64 kbps synchronous as required by the operating data rate of the data unit being tested.

If no loop back option is specified then an external bit error rate test set may be connected to the data unit being tested for the purpose of generating an error pattern to verify the accuracy of IBERT.

References:

BF0952
FC2052
BZ0592
BT1088

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	DATAPATH MCD DATA TRANSMISSION DELAY
Feature no	F6076

FEATURE SYNOPSIS

Currently a call is not chargeable if it does not remain in the talking state for the minimum charge duration (MCD) timeout of typically 2 seconds. This means a datapath call can be established, data transmitted and disconnected within 2 seconds without being charged. To prevent this, it requires that data transmission be delayed for 2 seconds after the terminating network circuit termination equipment (NCTE) goes off hook. This feature will thus delay data transmission in the terminating data unit by approximately 2 seconds. This value is to be determined by a special office parameter.

FEATURE DESCRIPTION

In conformance with the requirements established in the September 1983 LSSGR (sections 6.3.5 and 8.1.2) the Minimum Charge Duration (MCD) is implemented as follows:

- A call is considered answered when called party off hook supervision equals the 2 second MCD after allowances have been applied.
- Should called supervision return on hook before 2 seconds have expired, MCD timing starts all over again with the next called party off hook transition. Changes in calling party hook transition do not cause MCD timing to be restarted.
- If the called party off hook signal persists for at least 2 seconds, calculated after allowances have been applied, then and only then, the PMS report the answer to the CC so that the off hook recognition time is associated with the correct MCD interval.

The current problem has arisen from the combination of the FCC regulations which now permit billing immediately on answer (without any MCD timing) for digital trunks, and the capability of some CPEs to begin transmission immediately without the delays that were inherent in analog devices. Datapath products fall into this category. With the current implementation, a datapath call can be established, data transmitted, and disconnected within 2 seconds without being charged.

The solution to be implemented will prevent data transmission from occurring for a definable time (set by a special office parameter) by making changes in the XPM software.

Blocking data transmission will be achieved by delaying the sending of the message to the DU which initiates the T link protocol handshaking.

Ref: AC0027

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	RACK MOUNT DU EIA CONTROLLED LP BACK
Feature no	F6079

FEATURE SYNOPSIS

This feature allows the rackmount low speed data unit NT4X25CH to perform EIA controlled loopbacks. The EIA controlled loopbacks feature allows a device connected to the data unit (DU) to request, through the DTE/DCE interface, two loopback test conditions. This allows for the automatic testing of the near end DU, the far end DU, and the inter-connecting circuit. This feature is based on CCITT recommendations V.54 (loop test devices for modems).

FEATURE DESCRIPTION

The various loopbacks available in the DU are defined relative to the near end DU. The local loopback is a bi-directional loopback located at the DTE/DCE interface of the near end DU. The tip and ring loopback is located at the loop interface of the near end DU. The far end loopback is a bi-directional loopback located at the DTE/DCE interface of the far end DU. Each of these loopbacks can be invoked by a switch located on the DU.

The purpose of the EIA controlled loopbacks feature is to allow loopbacks to be requested via the DTE/DCE interface. There are the tip and ring loopback of the near end DU towards the DTE referred to in CCITT Recommendation V.54 as local loopback and the far end loopback towards the DTE. These loopbacks are controlled via control leads at the DTE/DCE interface and are separate from the DU loopbacks towards the TCM loop.

Ref: AC0032

Package	NTX250AA12 DATAPATH - BASIC
Feature set	FACILITIES
Feature	FEATURE ENHANCED HIGH SPEED DU(AP) FIRMWARE VERSIO
Feature no	F6080

FEATURE SYNOPSIS

This feature applies to the datapath feature enhanced high speed data unit, NT4X25AP and the high speed data unit, NT4X25AE, to provide for the interworking with other services in the public switched digital service (PSDS).

PSDS is a generic digital service offering data communication at 56Kbps. Unlike NT's datapath service, not all PSDS CPE's implement T link handshaking during the setup phase of a call, and may therefore be incompatible with datapath. This feature will enable a high speed data unit to communicate with other PSDS CPE'S by aborting the T link handshaking after some pre defined timeout period. The timeout period is to be determined by a special office parameter.

FEATURE DESCRIPTION

Datapath is NT's circuit switched digital data offering employed on the DMS-100 central office switch. Datapath provides full-duplex asynchronous and synchronous data transmission at various user-selectable speeds (300-19200 bps asynchronous and 1200-64000 bps synchronous) over two wire nonloaded loops using TCM technology. Datapath uses standard A & B bit signalling on the trunk side, and industry standard RS-232C and V.35 interfaces to the end users' data terminal equipment (DTE).

Datapath has several key advantages over other switched digital offerings such as:

- Datapath's DU provides a variety of both synchronous and asynchronous speeds which hence give it a definite advantage in the data market, since the DTEs used by most end users do not support high speed data.
- Datapath offers a modem pooling feature, enabling low speed digital datapath users to communicate with analog data users being served by analog modems.

Datapath continuously operates in the digital mode right from call setup time.

This feature involves the interworking of Northern Telecom's high speed digital data offering with other PSDS high speed digital customer premise equipment (CPE). An example of one service which this feature will enable interworking with is ATBT's circuit switched digital capability (CSDC). Normally a T link handshake occurs between DUs immediately after a call is

established. Currently no other PSDS terminal performs T link handshaking and thus are incompatible with data path service.

Compatibility with other PSDS on both incoming and outgoing calls is met by the DU first attempting a T link handshake, if successful, the far end is a datapath line and the call proceeds as a normal datapath to datapath call.

If unsuccessful, after a period of approximately four (4) seconds (datafillable time) after receiving the far end answer signal (originator) or going off hook (terminator, a mmessage will be sent to the DU to suspend T link handshake and go into data mode. At this point, data communication at 56 or 64 Kbps between datapath and PSDS terminal can take place if the PSDS terminal is ready.

Ref: AC0028

Package	NTX250AA12 DATAPATH - BASIC
Feature set	MAINTENANCE
Feature	BASIC BERT
Feature no	F6151

FEATURE SYNOPSIS

The existing integrated bit error rate tester or IBERT capabilities are enhanced by this feature with the addition of a 2047 bit pattern, error free second measurements, error injection and reset of the bit error rate test counters. IBERT provides a simpler method of testing datapath circuits by eliminating the need of using external test equipment which are inaccessible from any automated maintenance process.

FEATURE DESCRIPTION

The existing IBERT, in conjunction with datapath maintenance software, provides the DMS craftsman with the ability to monitor and diagnose from the MAP, the data transmission quality of a selected datapath line.

The existing IBERT capabilities are enhanced with the addition of four new functions:

- 2047 pattern
- error free second measurements
- error injection capability
- reset BERT counters

The 2047 bit pseudo-random pattern is provided for the purpose of bit error rate testing for channels operating at speeds greater than or equal to 48 kbps.

The error free measurements provide the DMS craftsman with a better indication of whether the transmission errors occur in a random pattern or in bursts.

Error injection capability eliminates the need of using an external BERT for injecting errors into the bit pattern sent back to the IBERT in order to verify the abilities of the IBERT in detecting and reporting errors.

The reset BERT counters capability updates the existing IBERT capabilities to include the ability to reset all statistical counters at any time.

Ref: AC0105, BC2051

Package	NTX250AA12 DATAPATH - BASIC
Feature set	MAINTENANCE AND TESTING
Feature	DATAPATH MTA
Feature no	F6176

FEATURE SYNOPSIS

This feature allows subscribers' loops to be tested by providing metallic access to the loops while excluding the line card from the test. Enhanced JACK and TONEGEN commands at the MAP are provided to activate this access and enable the testing and monitoring of the subscriber loops.

FEATURE DESCRIPTION

The objective of this feature is to exclude the line card from the line test of the subscribers' loops which is set up either by the JACK or TONEGEN command. The exclusion of the line card is to allow high frequency signals or high current voltage to pass through.

Metallic access is switched to the subscriber's loop by means of a metallic test access unit (MTA). The metallic access is provided on the horizontal of the MTA and the subscriber's loop is connected to the vertical of the MTA. The horizontal and vertical of the MTA are joined at cross connects within the MTA allowing metallic access to the loop's tip and ring.

A new optional parameter called METALLIC has been introduced to the JACK command to have the MTA switch a test jack at the MAP to the subscriber's loop. This would enable tests to be performed using external test equipment plugged into the test jack. During testing, the line card has its cutoff relay activated separating it from the subscriber's loop and protecting the line card from damage.

The TONEGEN command has also been enhanced to accept the optional parameter METALLIC which allows the connection to the subscriber loop to be set up bypassing the line card. The metallic connection in this case is with a transmission test trunk which is connected across the network and through a Montalk test trunk card to the MTA. Monitoring of a subscriber's loop can then be performed over the transmission test trunk.

Ref: AG0054

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SERVICES
Feature	PROFILE ENHANCEMENT
Feature no	F6323

FEATURE SYNOPSIS

This feature provides table control, service orders and profile downloading for datapath synchronous automatic calling (SAC). The feature adds four new parameters to the data structure containing characteristics of the DU. The changes affect low speeds (LS), high speed (HS), low speed loop extension (LSEXT) and high speed loop extension (HSEXT) data unit profiles. Data units which do not have the SAC capability will ignore the new information.

FEATURE DESCRIPTION

Profile downloading allows the profile information to be sent down to the data line card (DLC) each time the data unit (DU) has been returned to service. The DLC will store the profile and send it down to the DU after TCM sync has been lost, or power-up has been initiated. The SAC information introduced by this feature will be included in the profile sent to the DU.

Ref: DDOCs BV1309, AV0036

Package	NTX250AA12 DATAPATH - BASIC
Feature set	ADMINISTRATION
Feature	DATA CALL ID ON SMDR
Feature no	F6686

FEATURE SYNOPSIS

This feature records Datapath and ISDN data calls into Station Message Detail Recording (SMDR) records.

It also indicates in the record if the call utilized Modem Pooling resources.

The data call and resource identifications are for the Operating Company's purpose of billing and analysis processing.

FEATURE DESCRIPTION

Data Call Identification

The data call identification feature indicates whether a call is digital data, analog data or voice.

The identification makes it possible to generate call statistics and impose separate tariffs for data calls.

The identification is accomplished using a one-digit field, Data Call Identifier (DCI) in the ORIGID field of the SMDR call records.

Modem Pool Utilization

When a data call is placed from a data unit (DU) to a modem in the switching network, the DMS-100, upon request from the DU user, inserts a Modem Pool (MP) member into the end-to-end connection. This insertion allows the DU to communicate directly with the DU in the MP member digitally, and the modem to communicate directly with the Modem in the MP member using voice signals.

Modem Pools can be purchased and maintained by the customer. However, Modem Pools generally belong to and are maintained by the Operating Company.

Modem Pools that belong to the Operating Company are considered as network resources. Any use of such resources may be subject to billing by the Operating Company.

Activating This Feature

To activate this feature, the office parameter DATA_CALL_SMDR must be set to 'Y'.

Ref: FDOC AC0427

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SERVICISS
Feature	DATAPATH PROFILE ENHANCEMENTS II
Feature no	F7270

Synopsis

The Datapath Profile Enhancements feature changes the table control parameters used to enter Clear To Send (CTS) delays for Datapath products.

Implementation

This feature replaces the old parameter, CTSDELAY, with three new parameters, LOCALCTS, DELAYA, and DELAYB, in Table DPROFILE. To request local delays, the LOCALCTS parameter is set to "Y". Parameters DELAYA and DELAYB define a set of four delays for local and end-to-end delays.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks (IBN) - Basic
- NTX106AA IBN - Proprietary Business Set
- NTX250AA Datapath Basic
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Restrictions

The office parameters LOCALCTS, DELAYA, and DELAYB are only available on the-low speed and high-speed Data Units in Table DPROFILE.

Reference

FDOC AC0462

Package	NTX250AA12 DATAPATH - BASIC
Feature set	SERVICISS
Feature	HAYES KEY BOARD DIALING HIGH SPEED ENHANCEMENTS
Feature no	F7271

Synopsis

This feature gives the user of Datapath Hayes-compatible keyboard dialing (KBD) the option of deactivating Hayes autobauding. When Hayes autobauding is deactivated, the keyboard operates in fixed mode. Fixed mode is required for certain applications to work with Hayes-compatible keyboard dialing.

Implementation

Hayes-compatible keyboard dialing is provided by means of a profile download with Datapath option DPOPTS set to 'AUTOBAUD' to activate Hayes-compatible keyboard dialing.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX106AA IBN - Proprietary Business Set
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature operates with Datapath Keyboard Dialing - Hayes Protocol support (AC0106). When the Data Unit is configured through a profile download (F3759 NTX250AA) and Hayes-compatible KBD is selected, the Data Unit defaults to fixed-speed KBD operation.

Limitations

Some PC programs do not have a means of altering delay between autobauding characters. If Hayes autobauding is active, these programs do not work with the Data Unit at 19,200 bps.

Some PC programs send commands before the Data Unit has time to set up its Data Terminating Equipment (DTE) interface for autobauding. If Hayes autobauding is active, these programs do not work with the Data Unit.

When Hayes autobauding is not activated, implementation of the Hayes AT command set is not strictly Hayes-compatible. That is, PC software packages that require the Data Unit to autobaud on every AT command do not work. Also, if the user changes the speed of the DTE, the speed of the Data Unit must be changed as well.

Reference: FDOC AC0463

Package	NTX250AA12 DATAPATH - BASIC
Feature set	DATAPATH
Feature	DATAPATH COAX ELIMINATION FOR IBM 3194 TERMINALS
Feature no	G0049

Synopsis

This feature extends the capability of the Coax Eliminator Data Units (DU) to support Distributed Functional Terminals (DFTs), in particular the IBM 3194 DFT Display Station.

This feature provides multiple screens on the IBM 3194 DFT.

Type A (bisync) and Type B (SNA) coax links are supported.

Implementation

- * Prompts for the KeyBoard Dialing (KBD) Man Machine Interface (MMI) are textual instead of the current single character prompts
- * Keys are alphanumeric/symbolic rather than the number/function keys found on a conventional keypad.
- * Program indicators rather than lamps or tones indicate errors.
- * A ReLeaSe (RLS) switch instead of an RLS key is used.

The 3194 Coax elimator provides on-screen editing and indicates when the TIF is being tested by the DMS/SL-100. It is compatible with the 3174/3274 and 3276 control units and supports the following IBM Control Unit Terminals:

- * 3278 mod 2-5 monochrome
- * 3194 Intelligent Display Station - CUT mode; full support of IBM's systems network architecture (SNA) protocol
- * 3270 PC CUT mode, including graphics support in DFT mode
- * 3279 colour display with convergence
- * 3178 monochrome
- * IBM PC with IRMA

Extended attributes and light pen features are supported on these terminals.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 NTX100AA Integrated Business Networks - Basic (IBN)
 NTX106AA IBN - Proprietary Business Set

NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

KBD is initiated automatically when the DTE is set up. Prompts are provided to establish the connection.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Up/down loading for the IBM PC with IRMA is not supported.

The 3194 Control Unit Interface (CUIF) is not compatible with the 327X Terminal InterFace (TIF).

The 3194 TIF is compatible with the 327X CUIF but there is no DFT support.

Reference: FDOC AF1096

NTX251AA05 Status: RTM DATAPATH - MODEM POOLING

FACILITIES	:	
OUTBOUND MODEM POOLING		F3173
INBOUND MODEM POOLING		F3174
MODEM POOL DATA UNIT		F3460
FACILITIES	:	
MODEM POOLING PHASE II		F3760
MAINTENANCE	:	
MODEM POOL TESTING		F6024
RESOURCE SELECTOR OVERRIDE		F6325

Package	NTX251AA05 DATAPATH - MODEM POOLING
Feature set	FACILITIES
Feature	OUTBOUND MODEM POOLING
Feature no	F3173

FEATURE DESCRIPTION

Description

The Outbound Modem Pooling (OMP) feature provides an analog modem when a DU is calling either a modem or another DU over analog facilities. To complete a DU to DU call over analog facilities the terminating DU also requires the Inbound Modem Pooling feature. In either case, when a modem is used at the terminating end of a DU data call, the modem will answer the call and return carrier or answer tone. When the user hears the tone over the speaker, the user depresses the NRS key to connect a preselected modem. The modem will have been reserved by this stage of the data call.

Modem Pools are groups of similar type modems, each one specially wired to a DU. The modem reacts to the DU and functions as if it was connected to the Data Terminal Equipment (DTE). The DU also reacts to the modem as if the modem was the DTE. The modem pool DU will be referred to as the OMP DU.

When the user hears the modem tone and depresses the NRS key, the originating DU is connected to the OMP DU and the modem is connected to the terminator (outgoing trunk or modem). The modem converts the analog signal into digital data for the OMP DU, then the OMP DU converts the digital data into an internal data protocol for the calling DU. The reverse is done when the calling DU transmits data back to the called DU or modem.

Should a DU with the OMP feature make a DU to DU intra office call, the modem pool member will not be reserved or connected.

Network Resource Selector

A Network Resource Selector (NRS) system provides resource pools to aid DU data transmission. Modem Pool's are stored, processed, and manipulated by the NRS system. The customer datafills the NRS tables for the resources the customer needs. A NRS Group name is used by a DU to connect to a resource or modem. This NRS Group name is stored in the DU's data, When a Du has a stored NRS it is referred to as having a default NRS.

For Outbound Modem Pooling, the default NRS will be used to reserve a modem. The modem will be reserved when the DU originates a data call.

Modem Pools

The modem pool facility provides the DU user with the ability to select a variety of modems with different speeds and/or options. A customer can datafill the NRS tables to provide the modems required to meet the customer's needs.

Care must be taken when the customer datafills the DU's originating default NRS. The modem the NRS selects must also be compatible with the Data Terminal Equipment (DTE). For example, if the DTE is set at 1200 baud, asynchronous, and full duplex, a modem with matching settings must be selected to be able to have data transmission. Besides matching the DTE, the selected modem must be compatible with the originating DU and the terminating modem equipment. Since it is usually difficult and sometimes impossible for the terminating modem equipment to change to match the originator, it is therefore, the responsibility of the originating DU to select the matching modem equipment.

Feature Restrictions

- (1) If the user receives reorder as a result of not being able to locate a free member in a modem pool, Ring Again cannot be activated.
- (2) Ring Again cannot be activated for a DU to non-DU call.

Failure Conditions

- (1). If the NRS lamp does not flash after the DU user has entered the called DN, then a free DU-Modem pair could not be found in the desired modem pool. The user must go on hook before making another attempt to obtain a free modem pool member.
- (2). If the NRS lamp does not turn on solid after the NRS key has been depressed then a failure condition has occurred while connecting the modem. This could occur because of network blocking or other related problems. In such cases the user will receive reorder tone.
- (3). Should a modem pool member be required, and all the members are busy, the user will receive reorder tone. The user will not be allowed to continue the data call.

Package	NTX251AA05 DATAPATH - MODEM POOLING
Feature set	FACILITIES
Feature	INBOUND MODEM POOLING
Feature no	F3174

FEATURE SYNOPSIS

To effect data transmission across an analogue switched network, modem facilities are required. As part of the datapath facility, modem pools are provisioned at the central office. The CO, upon identifying that a modem is required for an incoming call to a DU, can switch a modem into the path such that the call may be successfully completed. This feature is complementary with the outbound modem pooling feature (see FDOC V0927), whereby the CO identifies the need for a modem on an outgoing call from a DU.

FEATURE DESCRIPTION

When the CO receives an incoming call destined for a DU, and the CO has identified that a modem or an analogue facility has been used in the call path, the CO assigns a MODEM to the call. This MODEM is switched into the call path after selection from a MODEM pool. The modem pool consists of a variety of modems (different speeds and options) each wired to a DU. When in the call path, the modem is connected to the incoming analogue trunk and the IMP DU is connected to the terminating DU. The CO decides which type/speed of modem to use from data stored relating to the terminating DU. The customer datafills a network resource selector table to indicate which modem is compatible with his terminal equipment.

The CO determines whether IMP is required in the following manner.

For intra-office calls, the CO holds data on all its terminations. For a DU to DU intra-office call, no modem is required for a modem to DU intra-office call, a modem is required and IMP is activated. A modem of the correct speed/type is selected from the pool and inserted in the call path.

For inter-office calls, the CO determines IMP activation from the incoming trunk type and the termination type. IMP is activated if the termination is a DU and if the incoming trunk type is analogue.

If the CO is part of an ESN, and the ESN protocol indicates a digital call type, then IMP is not activated. Similarly, a TTN, which uses prefix digits for call type and which indicates a digital call type, will not activate IMP. Details of these can be found in FDOC V0926.

If the CO is not part of an ESN or TTN and the incoming trunk is digital, the CO cannot determine whether the origin is a DU or modem or whether analogue facilities have been used in the call path. To solve this problem, the CO completes the call to the required DU in the normal manner. When

the DU goes off hook, and it is a DU to DU call, KHP will start within one second. If KHP does not start within 1-2 seconds (office parameter), then a modem is calling or analogue facilities have been used. IMP is then activated to insert a modem in the call path.

The call is completed and released according to normal call processing procedures (see FDOC V0921); all paths associated with the call are released and the modem is returned to the pool.

More details on IMP are given in the FDOC V0928.

Package	NTX251AA05 DATAPATH - MODEM POOLING
Feature set	FACILITIES
Feature	MODEM POOL DATA UNIT
Feature no	F3460

FEATURE SYNOPSIS

To effect data transmission between two DUs over an analogue transmission path, modems must be inserted into the call path. As part of the Datapath offering, modem pools are provided at COs. A range of modems may be provided, each directly wired to a modem pool data unit (MPDU).

FEATURE DESCRIPTION

Modem pooling operation, and the conditions under which operation is instigated, is fully described in the modem pooling references. When, for example, a DU attempts to originate a data call over an analogue transmission facility, the CO recognises this and assigns a modem from the pool to the call path. The modem is actually a modem/data unit pair directly wired together. The originating DU may communicate with the MPDU, which communicates directly with the modem. The modem modulates the information accordingly for transmission over the analogue facility. In this way, full data transmission capability may be provided.

The MPDU itself is a modified version of the standard subscriber DU (see references). When connecting the MPDU to a modem, a null-terminal connector is required between the two RS-232 interfaces. An optical coupler is also required to provide MI/MIC modem control and the MI/MIC leads are brought out via the phone jack at the back of the DU.

Full details of the MPDU interfaces and operation are to be found in the referenced documents.

References

BV0927 Datapath Outbound Modem Pooling
BV0928 Datapath Inbound Modem Pooling
BF0444 HSDU
BF0445 LSDU

Package	NTX251AA05 DATAPATH - MODEM POOLING
Feature set	MAINTENANCE
Feature	MODEM POOL TESTING
Feature no	F6024

FEATURE SYNOPSIS

The Datapath Modem Pool testing feature provides a man-machine interface which enhances a Telco's ability to test and maintain datapath modem pools. Previously, modem pool test capability was limited, labour intensive and required the use of external test equipment. This new feature provides an integrated modem pool testing capability through the use of the existing IBERT feature for performing the actual bit error rate testing of a given modem pool.

FEATURE DESCRIPTION

A datapath customer with a data unit who needs to use analog facilities for data transmission or to communicate with an analog device, such as a voice frequency modem, requires a special datapath feature called Modem Pooling.

The modem pooling feature inserts a data unit, which has been specially wired to a voice frequency analog modem, into the call path. This data unit - modem pair is known as a modem pool element and the modem pool modem functions as if it was connected directly to the user's data terminal equipment.

The Modem Pool testing feature represents the first phase of the total datapath modem pool maintenance enhancement to be implemented in the future. It is not intended to be a complete testing facility, rather it will allow a craftsman to determine if a modem pool element works or not.

A given modem pool element is tested by connecting another known working maintenance modem pool element to it in a back-to-back fashion. An IBERT is then connected to each of the two modem pool data units and a known bit pattern is transmitted from end to end in full duplex mode. Once a fault is detected, individual BERT tests can be run on the data unit half of the modem pool element to sectionalize the fault to the data unit components or to the modem itself.

Ref: AC0113

Package	NTX251AA05 DATAPATH - MODEM POOLING
Feature set	MAINTENANCE
Feature	RESOURCE SELECTOR OVERRIDE
Feature no	F6325

FEATURE SYNOPSIS

The purpose of this feature is to give the data unit user the option of bypassing the outbound modem pool feature. This will be accomplished by entering prefix digits before the called Directory Number (DN) digits.

FEATURE DESCRIPTION

Currently, the following sequence of events will happen to a Data Unit (DU) user with the Outbound Modem Pool (OMP) feature when an inter-office data call is made to a DU or a Modem.

1. DU dials the DN digits.
2. An attempt to reserve the OMP is made. (If all the OMPs are busy the originating DU will receive REORDER tone).
3. The OMP will be dropped if the terminator is a DU or the path taken is purely digital trunk.
4. DU connects to the terminator.

As explained above, OMP is not required when the terminator is a DU or a digital trunk. However, if the OMPs are all busy, the DU user will receive REORDER tone even though the Modem Pool (MP) resources are not needed to complete the call. Therefore, this feature provides a method for bypassing the OMP for such cases.

This feature does not guarantee an all digital connectivity from the originator to terminator when No Modem Pool (NMP) prefix digits are dialed, although a digital path is necessary to connect a DU to another DU. The RESOURCE lamp on the DU will not flash, since this feature will not select OMP element.

NTX259AA03 Status: RTM DATAPATH EXTENSION - DPX

SERVICES	:	
DATAPATH EXTENSION UNIT DPX		F5585
MAINTENANCE	:	
DPX MAINTENANCE		F5754
ADMINISTRATION	:	
DATAPATH D4 DPX FIRMWARE		F6314
DATAPATH D4 DPX MAINTENANCE ENHANCEMENT		F6315

Package	NTX259AA03 DATAPATH EXTENSION - DPX
Feature set	SERVICES
Feature	DATAPATH EXTENSION UNIT DPX
Feature no	F5585

FEATURE SYNOPSIS

This feature provides the ability to extend the loop range of data services provided by the central office Datapath service using a DS-1 carrier, a Northern Telecom DE-4E channel bank and a QPP 629A channel unit, Datapath extension card (DPX).

FEATURE DESCRIPTION

The present implementation of Datapath is via the data line card mounted in a line module and data units located on the customer premises is limited to 5km. This feature extends the distance to customers data units further by using a DS-1 carrier and a DE-4E channel bank via QPP 628A channel unit, datapath extension card.

The DPX interconnection supports synchronous data rates from 1200 to 56000 bps and asynchronous data rates from 300 to 19200 bps.

Ref: BF0859

Package	NTX259AA03 DATAPATH EXTENSION - DPX
Feature set	MAINTENANCE
Feature	DPX MAINTENANCE
Feature no	F5754

FEATURE SYNOPSIS

This feature provides the maintenance for the DPX line and its associated data line card (DLC) and data unit (DU). The maintenance functions are provided from the maintenance administration position (MAP) - line test position (LTP) level.

Existing data line maintenance and bit error rate testing (BERT), is extended to the DPX line.

FEATURE DESCRIPTION

In order to perform any maintenance functions on the DPX and its associated DLC and DU a communication channel is established to the DPX. In baud signalling is used with any maintenance functions being made through the IBERT. Thus a maintenance connection is established through the DMS system to the trunk associated with the DPX located on the DE-4E channel bank.

The maintenance functions provided from the LTP level of the MAP are:

1. POST_ post the DPX lines:

- a) by assigned billing directory number
- b) by trunk group CLLI name
- c) all DPX lines

2. Busy - set the trunk man busy or off line

3. RTS - return the trunk to service

4. CKTLOC - get circuit location information.

5. LOOPBK - DLC loopback at the DLC

DU-64K loopback at DU TCM channel

DU loopback at the DU interface to the external equipment

6. DIAGN - self tests on DPX and DLC circuits

7. SUSTATE - status of DPX, DLC and DU. Version and vintage of DPX, DLC and DU

8. BERT - bit error rate tests (looping at DLC or DU as requested).

Ref: BC2240, BF0720

Package	NTX259AA03 DATAPATH EXTENSION - DPX
Feature set	ADMINISTRATION
Feature	DATAPATH D4 DPX FIRMWARE
Feature no	F6314

FEATURE SYNOPSIS

This feature economically extends the DMS datapath service to non-DMS central offices. It is implemented using a special plug-in card for Western Electric compatible D4 channel banks, called the D4 datapath extension card (D4 DPX).

FEATURE DESCRIPTION

Using D4 channel banks, the datapath loop can now be extended beyond 5 km. Using D4 DPX card provides the necessary signalling to message conversion between a standard datapath subscriber loop and the DS1 channel. The DS1 carrier is connected to the DMS-100 via one of three digital trunk peripheral modules:

- digital carrier module (DCM),
- digital trunk controller (DTC),
- line trunk controller (LTC).

The D4 DPX firmware supports following functions between a standard TCM subscriber loop and the DS1 channel:

- call processing
- maintenance
- self test.

Ref: DDOC AC0029, DDOC BF0859

Package	NTX259AA03 DATAPATH EXTENSION - DPX
Feature set	ADMINISTRATION
Feature	DATAPATH D4 DPX MAINTENANCE ENHANCEMENT
Feature no	F6315

FEATURE SYNOPSIS

This feature will enhance the DPX diagnose and sustate commands from the DMS maintenance administrative position (MAP). The changes to the maintenance output will reflect the differences between the D4 DPX and the DE-4E DPX.

FEATURE DESCRIPTION

This feature has been initiated to eliminate any confusion with display of maintenance results for the DPX. The problem arises from the fact that a D4 DPX does not contain a data line card (DLC) as opposed to the DE-4E DPX which does. Pre-BCS-23 maintenance software that a DLC exists in both the D4 DPX and DE-4E DPX, and will report the status of both the DPX and the DLC.

With the enhancements implemented, the craftsperson will receive a unique response from maintenance commands performed on either of the two DPX circuits. Any reference to a DLC on the D4-DPX will be eliminated.

Ref: DDOCs - BC2240, AC0099

NTX260AA02

Status: RTM IBN - PRESET CONFERENCE

SERVICES

:

PRESET CONFERENCE

F1880

Package	NTX260AA02 IBN - PRESET CONFERENCE
Feature set	SERVICES
Feature	PRESET CONFERENCE
Feature no	F1880

FEATURE DESCRIPTION

This feature will allow an IBN station, trunk or attendant console to set up a preset conference with up to 25 conferees by dialling a specific directory number. This invokes simultaneous ringing of the preselected conference members. The conferees are specified in advance in a data table indexed by the conference directory number. When the first conferee answers, the conference begins. As others answer, they are added to the conference. The conference is terminated when all the conferees have disconnected.

A) Conference origination and screening

Upon origination, the dialed directory number will be recognized as a request for an IBN preset conference. Translations will check the originator's data against the data of the preset conference DN. If the call is valid, the originator will hear ringing when the conference has been initiated. If invalid, the originator will be routed to treatment.

If the IBN station's customer group has used its maximum number of six port conference circuits (see feature V1122), the originator will be routed to reorder tone. If the preset conference is datafilled as an Emergency type conference, the number of circuits used is incremented but not checked against the maximum allowed for the customer group.

An IBN station not permitted to originate a conference will dial 0 to access the attendant. The attendant may then dial the preset conference DN, and transfer the call back to the station on hearing ringing tone.

A preset conference can also be originated by a Direct-in-Dial agent (ie. POTS line or incoming trunk) depending on the datafill of the preset conference.

If the originator is a trunk, the trunk type must be one which returns disconnect supervision. If such is not the case, the caller is routed to reorder tone.

Since there could be more than one originator for a conference, when an attempt is made to originate a conference which has already been initiated, the second originator will be routed to busy tone.

The feature will allow for the originator's directory number to be part of the preset conference list of numbers.

B) Preset Conference and Conferees directory numbers

A 10 digit directory number will be assigned to each preset conference. Access from the customer group is by dialling the conference's extension number.

Associated with each preset conference DN will be 1 to 25 preset conferee directory numbers. The conferee address may be a string of up to 18 digits. Associated with each conferee DN will be a timeout interval and an optional alternate DN. If the conferee does not answer within the timeout interval, the call attempt ends. If there is an alternate DN, an attempt will be made to complete to this DN.

The customer group and an NCOS will be datafilled for the conference to allow for proper screening and locating the appropriate translator.

All the above information will be stored in customer data (PRECONF). Validation of the conferee DN will not be done during data fill.

There will be no restriction on conferees having to belong to the same customer group.

C) Preset conference bridge selection

The conference bridges will be selected from the pool of idle bridges. A check will be made to ensure that the customer group is not using more than its allowed number of the bridges in the office. If sufficient bridges cannot be obtained, the originator will be routed to no circuit treatment.

Once the required bridges are seized, the originator receives audible ringing while calls are originated to all the addresses stored for the desired conference.

Automatic retrial will be provided and one alternate address per conferee will also be available when required. Automatic retrial is attempted on all conferees that have not returned answer supervision within an adjustable interval of 15 to 60 seconds, after the call to that conferee was originated. If a call to a primary address fails to complete within two trials, and the conferee is provided with an alternate address, two call attempts will be directed to the alternate address.

Retrials will not be attempted on an address which is a secondary conference bridge (this information is datafilled).

In the case of trunk groups that do not return 'true' answer supervision (ie 5X25 and FX on DCM trunks), a tone detector will be used to determine answer. As above, if answer is not detected after two attempts, the alternate address is used if there is one.

It should be noted that if answer propagation is interrupted, the feature will not be able to complete to that conferee (ie conferee has line option FNT or INWATS).

The conference data can be set so that the conference starts as soon as the first conferee answers. In this case, the answer will cause the audible ringing to the originator to stop and the conference to begin. Attempts to complete the calls to unanswered conferees will continue, with no audible ring. As other conferees answer, they will be cut into the conference after 400ms of conference warning tone (440Hz+480Hz) has been applied. The conference can also have a delayed start. When the first conferee answers, a tone or announcement (according to datafill) will be attached to the conference bridge. The tone or announcement will continue as an audible signal to answering conferees until 2 seconds after all conferees have answered. The originator may force the conference by depressing the '#' key on a 2w 12 key DTMF set or the 'A' key on a 4w 16 key DTMF set.

D) Secondary Conferencing

Secondary conferencing, which is the ability to interconnect with remote conference bridges, will be permitted. When a conference is activated and one of the addresses requires a secondary bridge, the address will be processed in a normal manner and directed toward the office serving the secondary equipment.

All conferee directory numbers which are secondary conferences, are identified in the PRECONF table.

E) Termination

All connections will automatically be released and equipment returned to idle when all the conferees have gone on-hook. Individual bridges are released from multiple bridge conferences as soon as the last conferee connected to them goes on-hook. Whenever a conferee disconnects, a 400ms burst of conference exit tone (350Hz+440Hz) is provided to all other members of the conference.

Datafill allows for the originator to be in control of the conference. In this case, when he goes on-hook, the conference is taken down even if there are conferees still on the bridge. If the originator does not control the call, when a conferee disconnects from the bridge, a check will be made for the presence of DMS stations or trunks with disconnect supervision. If no station or trunk of the described type is a conferee, the conference is taken down even though there could be conferees with no-disconnect type trunks still active.

FEATURE INTERACTION

- 1) If any of the conferees are connected to the DMS switch where the preset conference is being originated and has any of the following features
Call forwarding don't answer
Call forwarding busy
Call forwarding intragroup these features will remain active for the incoming preset conference call (if the primary address does not answer call forwarding will be attempted if it is activated).
- 2) On origination to a conferee, routing features Expensive Route Warning Tone and Off Hook Queuing will be deactivated.
- 3) When a conferee is connected to a preset conference, the following features will be disabled for the duration of the call
Call waiting
Three way calling
Busy verification of lines and trunks
Flash recall
Executive busy override.
- 4) If the preset conference involves an AUTOVON trunk, preemption will be allowed on the trunk. The feature will not allow for preemption of the conference bridges since the use of the bridges by a customer group is limited according to data fill (see feature V1122).
- 5) SMDR may be applicable to 1, several or all of the "legs" of the conference call. The SMDR feature should be referred to. Each leg, once added to the conference call, will be identified as a conference call in the SMDR record, though use of the originating feature code for preset conference.
- 6) If the originator is attempting to originate an IBN preset conference from the second leg of a three way call, he will be routed to reorder treatment.
- 7) If the originator is active in a Flexible Station Controlled Conference, flashes to initiate add-on, and then dials an IBN preset conference, the conference will set up. The originator cannot conference the preset conference and when he attempts, it will appear as a disconnect and the preset conference will be idled.

Package NTX262AA01 IBN PRIORITY CONSOLE ALERTING
 Feature set IBN
 Feature IMMEDIATE NOTIFICATION OF PRIORITY ENQUEUED CALLS
 Feature no F2528

FUNCTIONAL DESCRIPTION

1. Overview

This feature permits an attendant to be alerted to an emergency enqueued call when the Attendant Console is headset seated. The Attendant Console may be:

1. idle (This is an existing capability)
2. active on a call (any type of call)
3. in the Position Busy state or in Night Service
4. programming a feature

2. Notify versus Alert

Before BCS13, an Attendant Console had to be Idle to be notified of any enqueued call. As a result, the terms 'alert' and 'notify' had the same meaning and were used interchangeably. With this feature there is a difference between notifying an attendant and alerting an attendant. This distinction is as follows:

	Notify -----	Alert -----
Release lamp	ON	Not Applicable
Source Lamp (notel)	120 IPM	Not Applicable
ICI Lamp(s)	ON (note 2)	60 IPM
Audible Tone	YES (note 3)	See EMAL option

Notes:

1. The source lamp refers to the first idle loop.
2. Typically ON unless an ICI threshold has been exceeded. Ref V0433 for threshold details.
3. Refer to V1132 for various forms of console audible tones.

3. Defining Emergency Call

An enqueued call is an emergency call if the enqueued call's ICI is an emergency ICI. An ICI is an emergency ICI if the EMERG option in Table ICIDATA is present. If the EMERG option in Table ICIDATA is not present then the ICI is a regular ICI and the enqueued call is a regular call. In offices without this feature, EMERG option in Table ICIDATA cannot be present.

The number of emergency ICI's is limited to 5. Each customer group in an office with this feature can have 0 to 5 emergency ICI's. If one tries to datafill a sixth emergency ICI then the change to Table ICIDATA is disallowed.

Table ICIDATA is indexed by customer group and ICI number. If an ICI is an emergency ICI in a customer group then all calls going to an Attendant Console in that customer group with that ICI are emergency calls. It is not possible to differentiate emergency calls on a per subgroup nor on a per Attendant Console basis. Calls in the same customer group with the same ICI cannot be emergency calls for some Attendant Consoles and regular calls for other Attendant Consoles.

ICIs from 0 to 24 are predefined. ICI 25 is the Direct ICI. ICIs from 26 to 254 are customer specifiable. The Direct ICI cannot be an Emergency ICI. It is recommended that only customer specifiable ICIs be data-filled as emergency ICIs.

4. Alerting Attendant

When a regular call is enqueued or when an Idle Attendant Console is notified of an emergency call, Attendant Console Notification works as per DID V0433 - Uniform Call Distribution.

If the Attendant Console is not Idle and does have the emergency ICI assigned then the attendant is alerted to the emergency call by flashing the emergency ICI and by optionally sounding the Audible Tone. If an Attendant Console is not Idle and does not have the emergency ICI assigned then the Attendant Console is not alerted to emergency calls with that emergency ICI.

Emergency ICIs are not subject to ICI flash threshold. If one emergency call is enqueued then the emergency ICI flashes.

Emergency ICIs are not updated on all Attendant Consoles immediately because of real time constraints. All requests to update are made immediately but there may be a 10 second difference between the first Attendant Console updated and the last Attendant Console updated. 5. Audible Tone when Alerting Attendant

The Audible Tone is not sounded if any Attendant Console has already been notified of the emergency call. If an Attendant Console has not been notified of the emergency call then sounding of Audible Tone is controlled by EMAL option in Table SUBGRP. If EMAL option in Table SUBGRP is present then Attendant Consoles do get Audible Tone. If EMAL option in Table SUBGRP is not present then Attendant Console do not get Audible Tone. In offices without this feature, EMAL option in Table SUBGRP cannot be present.

Table SUBGRP is indexed by customer group and subgroup. All Attendant Consoles in a subgroup which are not Idle but do have the emergency ICI do or do not get Audible Tone when an emergency call is enqueued and an Attendant Console is alerted. It is not possible to differentiate on a per Attendant Console basis.

Audible Tone for Attendant Consoles which are not Idle is not recommended because it may be highly annoying to attendants who are busy on another call. The active call might already be an emergency call. The Audible Tone is specified in the Attendant Console data except that Long Buzz is not used. Long Buzz is replaced by Short Buzz.

6. Answering Emergency Calls

To answer an emergency call, an attendant must become notified and must answer the call via the ICI key. If the attendant hits the Loop key instead of the ICI key then the attendant is connected to the oldest call in the subgroup queue. To become notified an attendant can hit Release key or Hold key. If an attendant hits idle Loop key (auto-hold) then currently active loop is held and attendant becomes active on idle Loop. Emergency enqueued call is not accessed. If all six loops on an Attendant Console are held then the Attendant Console is alerted but not notified. To answer the emergency call the attendant must release a loop, be notified of the emergency call, and hit the emergency ICI key.

7. Example of Feature Operation

Assume that:

- 10 regular ICI queues contain 1 or more calls.
- 3 Attendant Consoles (AC1, AC2, AC3) have headsets jacked in, but are not Idle.
- all three Attendant Consoles are assigned the two emergency ICIs (E1, E2)
- AC1 has the 10 regular ICIs assigned

A call with emergency ICI E1 is enqueued.

- E1 ICI lamp changes from OFF to flashing on all 3 Attendant Consoles
- If EMAL option in Table SUBGRP is present then all 3 Attendant Consoles are given Alerting Tone

AC1 becomes Idle and is notified.

- RLS lamp turns ON
- Source lamp flashes
- 10 regular ICIs turn ON or Flash
- E1 ICI Flashes
- AC1 is given Audible Tone

A call with emergency ICI E2 is enqueued.

- E2 ICI lamp changes from OFF to flashing on all 3 Attendant Consoles.
- If EMAL option is present then all 3 Attendant Consoles are given Alerting Tone. If E2 call would have notified an Attendant

Console then Alerting Tone would not be given regardless of EMAL.

Assume the idle Attendant Console (AC1) depresses one of the emergency ICI keys (E1). The following occurs:

- RLS lamp turns OFF
- E1 ICI lamp changes from Flashing to ON
- Source lamp turns ON
- E2 ICI lamp continues to Flash.
- the regular ICI lamps turn OFF
- the attendant is connected with the E1 call.

Lamp states on the 2 other Attendant Consoles (AC2 and AC3) are as follows:

- RLS lamps can be OFF or ON
- E1 ICI lamp changes from Flashing to OFF
- E2 ICI lamp continues to Flash
- any ICI lamps which may have been ON, stay ON
- any feature lamps which may have been ON or flashing, are unaffected.

If 1 of the 2 other Attendant Consoles (AC2) becomes idle then the following occurs:

- RLS lamp turns ON
- the 10 regular ICI lamps turn ON or Flash
- E2 ICI lamp remains Flashing
- Source lamp Flashes

If AC2 depresses the E2 ICI key then the following occurs:

- RLS lamp turns OFF
- E2 ICI lamp changes from flashing to ON
- the Loop lamp turns ON
- the regular ICI lamps turn OFF
- the attendant is connected with the E2 call

Once AC2 has dequeued the last emergency call, E2 lamp on AC3 turns OFF.

8. Feature Interactions

The Call Waiting lamp remains unchanged. The Call Waiting lamp turns on when there is a call in the subgroup queue and flashes when the number of calls in the subgroup queue exceeds a computed threshold.

Night Service is unaffected. If Night Service is in effect then emergency calls are rerouted in the same way that ordinary calls are rerouted.

Direct calls are not affected. The Direct ICI is inherently a special ICI therefore the Direct ICI cannot be assigned the EMERG option in Table ICIDATA.

When certain features are active (eg. Busy Verify Line, Busy Verify Trunk, Code Calling) an attendant cannot be notified. The attendant is alerted to an emergency enqueued call.

NTX268AA02 Status: RTM FEAT GRP B AMA - END OFFICE (NT FORMAT)

NUMBER IDENTIFICATION/CHARGING :

ACCESS CHARGE RECORDING - END OFFICE (NT FORMAT)

F2564

FGB-AMA ENHANCEMENTS II

F5742

Package	NTX268AA02 FEAT GRP B AMA - END OFFICE (NT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ACCESS CHARGE RECORDING - END OFFICE (NT FORMAT)
Feature no	F2564

FEATURE DESCRIPTION

FEATURE GROUP B OPERATION

Feature Group B is a plan which enables Other Common Carriers (OCC's) to access the BOC (Bell Operating Company) network to provide long distance service to telephone subscribers. The subscriber would access the OCC he/she wished to use by dialing 950-10XX, where XX is a code identifying the carrier. After having dialed 950-10XX the OCC would provide second dial tone to the patron who would then dial a PIN code (optionally) and the number he/she wishes to reach. The OCC will bill the patron for long distance call and the BOC's will bill the OCC for the use of their network for both the origination and termination of the call.

Feature Group B is differentiated from Feature Group A (previously ENFIA A) in that 950-10XX is dialed and connections to the OCC's are via trunks rather than lines.

Two-way CAMA trunks will be used to connect OCC and BOC offices (both tandem and end offices). In a tandem office the incoming OCC traffic must be received on a supercama trunk (with ANI). Hence all outgoing OCC traffic in a tandem office will be supercama to two-way CAMA trunk calls. Terminating OCC traffic in both tandem and end offices will arrive from the OCC's via two-way CAMA trunks but will be routed thereafter as any normal call.

The recording of outgoing and incoming calls will be done at the BOC office which connects to the OCC switch.

NEW NT AMA RECORDS

Two new B records will be created for FGB Access Charge Recording. These records will contain provisions so that they may be used for FGD (Equal Access) recording. Each new B record will be accompanied by an extension record entry (EE record). The purpose of the EE record will be to provide a means of identifying the trunks used in the call.

ORIGINATING ACCESS CHARGE RECORD

The B0 record will be similar to an F4 record (currently used for standard DD long distance calls) with the addition of the following fields.

Feature Group Indicator - in order to differentiate FGB from FGD calls (and potentially FGA).

IC/INC PREFIX

For FGB calls this will correspond to the XX in the 950-10XX. This field will be four digits in length. The first three digits will be used to store the IC/INC prefix (three may be used in Equal Access) and the fourth digit will be used to indicate the how the prefix was found. The following number scheme is proposed:

- 0 - prefix not available (FGB terminating access records only)
- 1 - prefix taken from dialed digits
- 2 - prefix derived from trunk group data

CARRIER CONNECT DATE

A three digit field containing the day on which carrier connect occurred. Carrier connect is defined as the time when the start dial wink is received from the OCC.

CARRIER CONNECT TIME

Same as the standard time field except it will contain the time of the above mentioned wink.

ELAPSED TIME FROM CARRIER CONNECT

This field will be the same as the elapsed time except that it will contain the time from carrier connect to disconnect.

DIALING INDICATOR

A single digit field with the following scheme to indicate what was dialed:

- 1 - PIC dialed, not 10XX or 10XXX
- 2 - 10XX or 10XXX dialed
- 3 - 950-10XX dialed

ROUTING INDICATOR

This will be used to indicate if the call was routed through a tandem office. If yes then the call was a tandem one (if no then an end office one). See the description of the Carrier Event Information below for further details.

ANI INDICATOR

This will be yes if the calling number was spilled to the OCC.

B1 - TERMINATING ACCESS CHARGE RECORD

B1 records will be used for calls arriving from an OCC. It will be essentially the same as the B0 record except that the calling number, the dialing indicator and the ANI indicator will not be present in the record. The semantics of the fields will be the same as for the B0 record.

AMADUMP

The AMADUMP utility will be enhanced as part of this feature to handle these new call codes to enable them to be displayed. The display format will be similar to that used on the previous pages.

Package	NTX268AA02 FEAT GRP B AMA - END OFFICE (NT FORMAT)
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	FGB-AMA ENHANCEMENTS II
Feature no	F5742

FEATURE SYNOPSIS

This feature allows feature group B (FGB) calls that are routed through a FGB tandem (FGBT) to be billed in the end office. The proper call code 134 billing record is made and automatic number identification (ANI) digits are not spilled to the FGBT.

FEATURE DESCRIPTION

FGB call processing in DMS system was originally designed to use centralized automatic message accounting (CAMA) billing for originating calls using an access tandem. LAMA billing was only supported if the end office had a direct connection to the FGB carrier.

This feature allows the option of LAMA billing for all originating FGB calls. Note that terminating FGB calls using an access tandem must still bill in access tandem.

Ref: FDOC BC2136
FSD 20-24-0300

NTX269AA07 Status: RTM UNIVERSAL TONE RECEIVER(DOMESTIC)

CALL PROCESSING	:	
UTR - CALL PROCESSING FOR LINES		F5446
MAINTENANCE AND TESTING	:	
ENHANCED MAINTENANCE FOR UTRS		F5506
CALL PROCESSING	:	
UTR - CALL PROCESSING FOR TRUNKS		F5537
RADR FOR UTR		F5726
XPM DTMF FOR TRUNKS WITH UTR		F5727
UTR BASE ENHANCEMENTS		F6284

Package	NTX269AA07 UNIVERSAL TONE RECEIVER(DOMESTIC)
Feature set	MAINTENANCE AND TESTING
Feature	ENHANCED MAINTENANCE FOR UTRS
Feature no	F5506

FEATURE SYNOPSIS

This feature provides an enhancement for the maintenance facilities for universal tone receivers (UTRs) on the new peripherals.

FEATURE DESCRIPTION

This feature will have the software to enhance the existing maintenance features and have the following capabilities:

- reporting to the CC of the OMs for UTRS
- inclusion of UTR measurements in dial tone speed recording
- enhancing the UTRs in-service diagnostic.

Ref: FDOC BC1766

Package	NTX269AA07 UNIVERSAL TONE RECEIVER(DOMESTIC)
Feature set	CALL PROCESSING
Feature	UTR - CALL PROCESSING FOR TRUNKS
Feature no	F5537

FEATURE SYNOPSIS

This feature will allow the Universal Tone Receiver (UTR) to be used for MF trunk call processing.

The functions include the allocation of a free receiver, establishing a path to the receiver, collection and processing of digits and finally the deallocation of the receiver. Prior to this feature the CC performed these functions. By migrating these functions from the CC to the peripheral module an increase in call processing capability can be achieved.

With UTRs the CC need no longer obtain a receiver and establish a connection between the originator and the receiver on call setup, and free the receiver and the connection at the end of digit collection.

The CC will inform the need for a receiver to the user in the peripheral module (PM). The user will then go through the following steps:

1. Request a UTR channel.
2. Instruct the UTR to start monitoring tones.
3. Once monitoring has started, the user will be informed of the digits which will be sent to the CC.
4. When the receiver is no longer required, the user must deallocate the UTR channel.

From this point on the call will proceed as before.

Only MF trunks using 'wink' and 'delay dial' signalling will be supported. Other features will follow in later BCSs to support other types of signalling (such as DTMF, immediate start).

UTR capability will only exist on XPM based peripheral.

Package	NTX269AA07 UNIVERSAL TONE RECEIVER(DOMESTIC)
Feature set	CALL PROCESSING
Feature	RADR FOR UTR
Feature no	F5726

FEATURE SYNOPSIS

This feature deals with software required to add receiver attachment delay recording capabilities to universal tone receivers on the new peripherals.

FEATURE DESCRIPTION

UTR RADR information is required for each new peripheral which uses UTRs. RADR information corresponds to the number of requests for UTR channels made by call processing. Information is collected under 3 fields:

1. Number of requests for a UTR channel for which RADR measurements were performed,
2. Number of requests for a UTR which were queued for 3 seconds or more plus the number of requests denied,
3. Number of requests for a UTR which were queued for 7 seconds or more plus the number of requests denied.

These pegs are reported to the CC as part of the OM group UTR. Once the CC has received the UTR RADR information from all the XPMS using UTRs for that reporting interval, the RADR pegs will be totalled across the XPMS and will appear in the output of the RADR OM group under the key UTR.

References:

BF0959 RADR for UTR

NTP 297-1001-114 Operational Measurements

Package	NTX269AA07 UNIVERSAL TONE RECEIVER(DOMESTIC)
Feature set	CALL PROCESSING
Feature	XPM DTMF FOR TRUNKS WITH UTR
Feature no	F5727

FEATURE SYNOPSIS

This feature deals with implementing software required to allow digit collection on a selected set of DTMF trunks using UTRs within XPMs. By migrating some digit collection functions from the CC to the XPM, an increase in CC call processing capacity can be achieved.

FEATURE DESCRIPTION

Currently XPM collects digits on MF trunks using UTR. This feature provides UTR capability on a selected set of DTMF trunk types. This involves changes to the trunk call processing software involved in the digit collection process for DTMF trunks.

UTR trunk supervision will be set up such that the XPM can collect both DTMF and DP digits. When the first digit is received by the XPM, the CC can assume that the redundant digit collecting process has been killed within the XPM. Currently, the CC starts digit collection on both the receiver and the trunk and on receipt of the first digit message, sends supervision to the receiver or to the trunk to kill the redundant digit collection process. For the UTR case, this will no longer be necessary.

The UTR will be accessed from the signalling processor and have the ability to associate predefined 'signal sets' (DT or MF) with any UTR channel as required.

References:

BF0961 XPM DTMF for Trunks with UTR

BC1483 MF Trunk Call Processing Using UTR

BF0665 MF Trunk Call Processing (XPM Requirements)

Package	NTX269AA07 UNIVERSAL TONE RECEIVER(DOMESTIC)
Feature set	CALL PROCESSING
Feature	UTR BASE ENHANCEMENTS
Feature no	F6284

FEATURE SYNOPSIS

This feature provides the option to avoid queuing a request for a UTR channel if there are no free UTRs and a line digit collection option to use UTRs.

FEATURE DESCRIPTION

In some applications, it is undesirable to queue a request for a UTR channel if there are no free UTRs. The primitive responsible for collecting digits from trunk terminals is modified so that it has the option of not queuing a UTR request if no UTR channels are available. The following responses will now be generated if a UTR is requested:

- 'UTR Granted' a free UTR channel is returned for use by call processing.
- 'UTR Denied' no free UTR channel is available.

In some instances line digit collection is done using regular receivers. This is because the digit collection primitive used does not have the UTR option. This feature enhances the digit collection primitive so it has the option of using the UTR. Digit collection using regular receivers will continue to function along with the UTR digit collection.

Ref: AC0127

NTX270AA12 Status: RTM NEW PERIPHERAL MAINTENANCE PACKAGE

ADMINISTRATION	:	
INCOMING START-TO-DIAL DELAY (ISDD) MEASUREMENT		F2883
MAINTENANCE AND TESTING	:	
MSB - DTC NUC BASIC MTCE		F3100
NPE - MSB MAINTENANCE		F3101
DMO - FOR NEW PERIPHERAL MODULES		F3103
NPE - LCM MAINTENANCE		F3104
NPE - LGC/DTC MAINTENANCE		F3106
NPE - PM LOADER		F3107
DIAL TONE SPEED RECORDING FOR LCM		F3118
ADMINISTRATION	:	
NPE - OM FOR LGC/DTC		F3350
MAINTENANCE AND TESTING	:	
LOADER ENHANCEMENTS		F3407
NPE - LM SPEECH LINK DIAGNOSTICS		F5405
PM MAP ENHANCEMENTS		F5497
XPM REALTIME ENHANCEMENTS		F5734
XPM ROUTINE EXERCISE TEST		F5813
XPM ROM DIAGNOSTIC MMI		F5833
XPM DIAG DRIVER ENHANCEMENTS		F5904
DTSR CAPACITY ENHANCEMENTS		F6162
DTSR REALTIME ENHANCEMENTS		F6190
ENHANCED DS-1 INTERFACE MAINTENANCE		F6299
MAINTENANCE AND TESTING	:	
AUDIBLE ALARMS FOR REMOTE CSIDE LINK FAILURES		F6400
MAINTENANCE	:	
XPM RTS ENHANCEMENTS		F6403
MAINTENANCE AND TESTING	:	
DECOUPLE CC RELOAD RESTART FROM XPM RESTART		F6442
NT6X50AB - MAP SUPPORT		F6505
INTERFACE	:	
CC SUPPORT FOR NT6X50AA		F6506
MAINTENANCE AND TESTING	:	
XPM SYNC DIAGNOSTIC		F6601
MAINTENANCE AND TESTING	:	
BETTER CC INTERPRETATION OF MESSAGING FAILURES		F6603
ADMINISTRATION	:	
ISDD PART 2		F7122
XPM ROM DIAGNOSTIC IMPROVEMENTS		F7125
MAINTENANCE	:	
XPM IPML MESSAGING FOR OFFICE RECOVERY		F7132
XPM BOOTSTRAP IMC/IPML MESSAGING ENHANCEMENT FOR NT6X69		F7133
ADMINISTRATION	:	
CC MANUAL SUPPORT FOR DEAD SYSTEM RECOVERY		F7228

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	ADMINISTRATION
Feature	INCOMING START-TO-DIAL DELAY(ISDD)MEASUREMENT
Feature no	F2883

FEATURE SYNOPSIS

This feature provides Incoming Start-to-Dial Delay (ISDD) measurements to indicate the grade of service that the DMS is offering to calls arriving on trunk groups.

The ISDD measurements are collected in Digital Trunk Controllers, Line Trunk Controllers, and Remote Cluster Controllers.

FEATURE DESCRIPTION

This feature adds OM group ISDD to accumulate ISDD measurements.

Incoming Start-to-Dial Delay is the time interval between an incoming trunk seizure and the trailing edge of the start-to-dial signal that is returned. This includes the time for messaging to request a receiver and receiver attachment delay.

The start-to-dial delay measured in OM group ISDD is defined as the number of times the elapsed time between the seizure and the trailing edge of the start-to-dial signal exceeds the preset threshold, and the number of times the elapsed time between seizure and abandon exceeds the delay threshold. The standard delay threshold is three seconds.

Measurements in OM group ISDD are collected on a per XPM basis for DTCs, LTCs, and RCCs that have trunks. These measurements are transmitted in a data message to the Central Control every 5 or 15 minutes.

Ref: FDOC AL0169

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	MSB - DTC NUC BASIC MTCE
Feature no	F3100

FEATURE DESCRIPTION

This feature provides the PM maintenance support for the IPMLs (Inter-Peripheral Message Links) to be used for direct PCM messaging between new PMS (e.g., MSB, DTC). The IPMLs utilize standard speech-type connections through the network. This feature will initially be used for the MSB-DTC connections for CCS (Common Channel Signalling).

The IPMLs should be robust. In particular, they should be more reliable than standard speech connections. For a dedicated CCIS DTC, the effect of losing its IPML to the MSB is essentially equivalent to losing the DTC. As a result, an IPML should survive all single fault conditions and, in some cases, double fault conditions (e.g., a link pair failure).

The IPML hardware must be duplicated to the extent that all single fault conditions can be bypassed.

If a fault occurs, it should be detected and full messaging capability restored within 1 to 2 seconds.

Each IPML will consist of a pair of network connections between the 2 specified PMS (IPCs - Inter-Peripheral Connections); one IPC will be designated as being Active and the other designated Inactive. Messages will be transmitted on the Active IPC and message scanning enabled on both IPCs. Having 2 IPCs per IPML provides 2 advantages:

- 1) There will be a standby IPC that messages correctly. This will minimize the recovery time in case of a transmission fault. A new connection need not be set up and message checking initiated. An IPML SwAct will be performed autonomously by the PM and the InActive IPC will become Active immediately.
- 2) The faulty IPC can be retained for fault isolation testing.

IPML maintenance in the CC has 4 basic requirements:

- 1) Preventative Maintenance - The CC must have the ability to do preventative maintenance (e.g., running out-of-service diagnostics) on the Inactive IPC. If a single IPC is used, the inactive plane would be tested. In-service tests should also be provided.
- 2) Fault Detection and Recovery - The IPML must have the ability to rapidly detect all fault conditions and be able to take corrective action to bypass the faulty component, hopefully without direct CC

intervention being required.

3) Fault Isolation - The CC must have the ability to run sufficient tests to isolate a faulty component to the card level.

4) The CC needs to ability to control the use of each plane of each IPC.

A single IPC does not meet the fault isolation requirements. Consequently, 2 IPCs are required. Using 2 IPCs also simplifies the preventative maintenance and fault recovery implementation.

Integrity checking will not be used for the IPCs. Various messaging tests will be used on the Active and Inactive IPCs to ensure that they are functioning properly. These tests will be as good as or better than integrity. They allow the policing of both IPCs without the CC running constant looparound tests.

The PM could perform an IPML SwAct, for example, under 3 conditions:

- 1) MIS timeout on 1 IPC
- 2) Timeout after message transmission (PACK,NACK) on 1 IPC
- 3) Double NACK on 1 IPC. The receiver would switch planes when sending the NACK.

The 2 IPCs that form an IPML should be set up on different network modules for maximum redundancy.

The hardware used in an IPC is usually shared with other applications. The main components of an IPC are:

- 1) Network
- 2) Network Link to From end (e.g., MSB)
- 3) Network Link to To end (e.g., DTC)
- 4) MultiPurpose hardware in PM - not duplicated for units (DS30 IF)
- 5) MultiPurpose hardware in PM unit - duplicated (FMT,CSM cards)
and
- 6) Dedicated hardware in PM unit - duplicated (part of MSG card)

Note that the only dedicated IPC component (part of the MSG card) is an integral part of the PM unit. Consequently, the current Network and PM Maintenance subsystems can be used to police the components of an IPC. Individual components comprising an IPC will be maintained by the appropriate maintenance subsystem, with the usual alarms being posted when problems occur. IPML alarms will also be posted to indicate that a fault has been detected. IPML alarms will have lower priority than equivalent PM alarms. If an IPC component fails, the IPML will perform a SwAct, if possible. The following table provides a brief summary of the

IPC components, their maintenance and alarm levels, and the IPML action in case of failure.

Component -----	Mtc and Alarm Subsystem -----	IPC Action -----
1) Both Network Planes Network	Network IPML SwAct and/or	IPML SwAct 2) Network Plane InActive IPC plane switch
3) Network Link Pair Network	Network IPML SwAct and/or	IPML SwAct 4) Network Link InActive IPC plane switch
5) PM Common hardware (not duplicated for units)	Network or PM	IPML SwAct and/or InActive IPC plane switch
6) PM Common hardware (duplicated for units) hardware PM (duplicated for units)	PM no IPML change	no IPML change PM SwAct 7) PM Dedicated PM SwAct

Table I. IPC Components

The IPCs will retain a given Network connection as long as possible. An ODM change will be required to move an IPC and/or IPML. The maintenance message testing (e.g., maintenance open condition) and call processing messaging aspects (open condition) of an IPC will be controlled separately, so that maintenance messages can be used to police both the Active and Inactive IPC.

The IPMLs are placed in service at the IPML level of the MAP. This level is situated off the PM level. The craftsman can Bsy, RTS and Tst the IPML as a whole, the individual IPCs and the planes of each IPC at this level.

Package NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
 Feature set MAINTENANCE AND TESTING
 Feature NPE - MSB MAINTENANCE
 Feature no F3101

FEATURE DESCRIPTION

I. Introduction

This feature implements the CC maintenance for the MSB (Message Switch and Buffer).

The MSB uses the standard PM states with the MSB PM state trying to follow the state of the active MSB unit as much as possible.

The MSB unit internal maintenance states are:

Running - The unit is currently active and processing signalling messages.

Ready - The unit is currently inactive but ready to accept activity if asked. All static data is up to date.

Syncing - The unit is currently inactive and both static and dynamic data is being updated from the active unit. This is a transitory state and, if the data update is successful the Ready state will be entered, otherwise the Busy state will be reentered.

Busy - The unit has been set busy by the CC or MSB maintenance. Diagnostics can be run on it.

Restart - The unit is currently performing a restart. Regardless of the outcome, the unit will eventually enter the Busy state after the restart has completed. If the restart fails, the Who-am-I mode may be entered. A more severe restart may be self-invoked or a Busy state may be entered with an indication that a reload is required.

The possible MSB unit internal states for each unit PM state are: Ref. 4):

Unit State	Active Unit Internal State	Unit State	Inactive Unit Internal State
-----	-----	-----	-----
InSv	Running	InSv	Ready
ISTb	Running	ISTb	Ready
ManB	Busy, Restart	ManB	Busy, Syncing, Restart
SysB	Busy, Restart	SysB	Busy, Syncing, Restart
CBsy	Busy, Restart	CBsy	Busy, Syncing, Restart

OffL Busy, Restart | OffL Busy, Restart

The relation between the 2 PM unit states and the PM state of the MSB or DTC module is:

Active Unit	+	Inactive Unit	--->	Module
-----		-----		-----
InSv		InSv		InSv
InSv		ManB, SysB, CBsy, ISTb		ISTb
ISTb		InSv, ManB, SysB, CBsy, ISTb		ISTb
ManB		ManB		ManB
SysB		ManB, SysB, CBsy		SysB
CBsy		ManB, SysB, CBsy		CBsy
OffL		OffL		OffL

The module state is used for the System and PM maintenance top level displays as well as for the individual MSB or DTC displays.

The STI cannot be removed from service individually. If an active STI encounters a problem, the MSB should perform a SwAct. An STI card should not be changed on the active MSB unit. The inactive unit should be set ManB when an STI or STB card is replaced. If a SwAct cannot be performed and the STI problem does not corrupt the bus, the MSB unit will still be removed from service.

A diagnostic of an MSB unit will include a test of the STAI (ST Access Interface - STB and associated STIs) component of the unit. Tests of individual STIs are not requested by the CC, only diagnostics of the entire MSB unit (including the STAI). The MSB maintenance system resident in the MSB will constantly be monitoring the MSB system, including the STAIs, and will take appropriate corrective action (e.g., SwAct) and notify the CC if a problem is detected. If a double fault condition occurs (fault on each STAI), the MSB will be set SBsy.

There may be as many as 5 MSBs. Link Sets and CCIS layers will not cross MSBs. Each DTC may communicate with all MSBs.

The basic MSB maintenance requirements parallel those of the LGC/DTC.

With the duplicated processing systems in these new peripherals, the emphasis is placed on rapid fault detection, isolation and recovery, rather than surviving double fault conditions. Maintenance can be divided into the 2 categories of Manual and System maintenance.

1) Manual Maintenance

Manual maintenance is performed at the MAP. The MAP levels for the MSB are situated in the PM maintenance subsystem and parallel those provided

for the LGC. These levels allow the craftsman to maintain the complete MSB, or operate on the individual MSB units.

The craftsman has the capability of accessing each unit of the MSB system to perform any relevant operation, including Bsy, Tst, and RTS. The MAP displays are designed to allow the craftsman both to readily access the desired component and to easily police the overall health of the MSB system. Preliminary displays for BCS11 are outlined in Figs. 8 - 10. All PM maintenance MAP displays will be revised for BCS12.

2) System Maintenance

System maintenance refers to maintenance operations performed autonomously by the system. These can be divided into 4 classes:

1) Responding to Unsolicited Messages:

When a peripheral module is operational it may send unsolicited messages to the CC to inform it of some significant event. These messages must be processed by the CC, which may or may not perform some operation in consequence. The following lists some of the messages:

- a) IPML Messaging Failure
- b) IPML Messaging Lost
- c) Activity Switch
- d) Inactive Unit Failure
- e) CSide Link Failure
- f) Who-am-I Messages
- g) Loader Messages
- h) Mate-was-Reset Message
- i) PSide Link Failure
- j) STC Fault Message

2) Fault Detection Audits:

The system performs periodic audits to detect problems in the peripheral module. If a minor fault is detected the module (or unit) is set to the ISTb state. If the problem is service affecting the faulty equipment is removed from service and set SysB. Manual action may be required to return it to service.

3) NFTRTS (Non First Time RTS) Audits:

If a piece of equipment has been removed from service by the system, the system will periodically retest it and return it to service, if possible.

4) Restart:

During and after a CC restart the initialization process must ensure that the peripheral modules come up in a sane in-service state, if they were in service before the restart. The CC must request the appropriate data from the PM to continue policing the module status.

Reference:

DMO for New Peripherals (F3103)

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	DMO - FOR NEW PERIPHERAL MODULES
Feature no	F3103

FEATURE DESCRIPTION

Description

1) LCM Assignments in LCMIN Table

The Line Concentrating Module Inventory table (LCMINV) lists the following data assignment for each bay associated with a local or remote LCM unit:

- where bay is part of a remote unit, specify the site name as signed to the remote location; else the default value is HOST
- frame type and number on which the peripheral module is physically mounted
- floor, row on floor, frame position in row and shelf position for each unit associated with a line concentrating equipment frame
- the issue name of the peripheral module software (for a list of available names, see the Bulk Change Supplement for the appropriate BCS)
- peripheral module type and number which the LCM gets attached to
- LCM C-side link assignment
- coded, superimposed and frequency ringing data

2) LC/DTC/LGL Assignments in LTCINV TABLE

The Line Trunk Controller Inventory Table (LTCINV) lists the following data assignment for each bay associated with an LTC unit:

- peripheral module type and number
- frame type and number on which the peripheral module is physically mounted
- floor, row on floor, bay position on row of each peripheral module
- produce engineering code of the peripheral module
- the issue name of the peripheral module software
- the terminal types vs the executive programs required for the line

and/or trunk modules

- the network links on which the peripheral module is assigned corresponding to the C-side links
- port designation on the P-side links

3) MSB Assignments in MSBINV TABLE

The Message Switch and Buffer Inventory Table (MSBINV) lists the following data assignment for each bay associated with an MSB unit:

- peripheral module type and number
- frame type and number on which the peripheral module is physically mounted
- floor, row on floor, bay position on row of each peripheral module
- product engineering code of the peripheral module
- the issue name of the peripheral module software
- the network links on which the peripheral module is assigned corresponding to C-side links
- designation of CCIS hardware type

The maximum number of MSB peripheral modules is five (i.e., they are numbered 0 to 4).

4) STC Assignments in STINV TABLE

The signalling Terminal Inventory Table (STINV) lists the following assignment data for each signalling terminal:

- signalling terminal index number
- designation of CCIS hardware type
- message switch and buffer module number
- signalling terminal controller module number
- signalling terminal controller slot number
- product engineering code of the signalling terminal controller card
- the issue name of the software load

- type of connection to the transmission link

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	NPE - LCM MAINTENANCE
Feature no	F3104

NPE - LCM Maintenance

FEATURE DESCRIPTION

This feature defines enhancements to CC maintenance on the LCM. Included is the man-machine interface (MMI), system fault recognition and recovery procedures, as well as manual maintenance capabilities to be provided. The following LCM maintenance tasks are covered in this feature.

- 1) Non - first time return to service audit
- 2) Software Data Audits
- 3) Periodic Inservice Diagnostic
- 4) Revision of Reconfiguration Strategies
- 5) Unsolicited Messages Logs, and Maintenance Actions
- 6) BSY / RTS Vids on LCM Module BSY/RTS
- 7) New DMSX Counters added to LCM msglink counters
- 8) Diagnostics result log for LCM diagnostic failure
- 9) Ringing Generator Functions:
 - i) CC and manual control
 - ii) transmission of static ring data on LCM return-to-service
 - iii) testing and diagnostics (manual and auditing)
- 10) Inter Unit Speech Link Functions:
 - i) Map display ii) functions and diagnostics
- 11) Table control of LCMINV (LGCINV): (remove ambiguities).
- 12) Faster recovery from Swacts (currently awaits audit to recover).
- 13) Clean-up function to support aborts from CI process.
- 14) Support LDPMALL command.

15) Periodic BSY/RTS of LCM units and ringing generators.

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	NPE - LGC/DTC MAINTENANCE
Feature no	F3106

FEATURE DESCRIPTION

i) INTRODUCTION

Maintenance capabilities are provided for LGC/LTC and DTC. Some of the maintenance items covered are:

a) Switch Activity (SWACT) b) Down loading of static data c) ROM based diagnostics:

- memory test - parity test
- sanity test
- timer test
- memory mapper test
- holding register test
- USART test
- interprocessor communication
- high level diagnostic
- audits
- unsolicited message handling
- system busy d) Some enhancements to the LTC/DTC are:
 - LTC/DTC unit can be busied without disabling speech on that unit's message link - verification of C side speech links
 - card configuration and trunk connection data
 - loader enhancement
 - DS1 line and digital trunk diagnostics for DTC's/LTC's
 - improved MAP display for diagnostics

a) Switch Activity (SwAct)

Both controlled and uncontrolled activity switching are supported. The craftsperson can request an activity switch. In addition, if the active unit detects a fault, it will initiate an activity switch and then inform the CC which will then alert the craftsperson.

b) Static Data

In feature C0617, the basic capability to download static data to an XPM was provided. In this feature, additional capabilities have been added. These include the capability to support a set of tables (in addition to the node table and terminal type table), the ability to do on-line updates of data and the ability to download static data on an RTS if the static data is out-of-date.

c) Enhanced Diagnostics

During a LoadPM sequence, once the status message has been sent, the ROM - based diagnostics will be invoked. If the test passes, that is, that no hardware faults are detected, the load sequence will proceed. Otherwise, it will be aborted.

A test or an RTS command from the MAP will invoke the high level diagnostics resident in the LTC. The set of diagnostics will determine whether or not an LTC unit can be or should be put in-service.

Miscellaneous

There are also other improvements to the maintenance system.

d) Enhancements to LTC/DTC MTCE

(1) Speech/Msg Channel Independence:

This will allow an LTC/DTC unit to be busied without disabling speech on that unit's message link

(2) CSIDE Speech Link Tests:

Include cside links in inservice-troubles. Tests will be provided to verify cside links as follows:

- i) following an integrity fail report
- ii) on request from the NET MAP or NET MTCE (link test)
- iii) on INSV tests of an active LTC/DTC unit.

(3) SWACT (incl. JAM):

To be defined.

(4) Static Data:

The following additions and enhancements will be made:

- i) Support Card Configuration data - options allowed:
 - DS1 cards - Continuity card
 - DS30A card
- ii) Include trunk connection data
- iii) Provide online updates when an LCM is added and for trunk additions
- iv) Perform a pilot test before attempting to load static data.

(5) Loader Enhancement

- i) Restructure loader implementation to simplify handling of different node types (e.g., CSC)
- ii) Provide LOADPM ALL.
- iii) Improve the efficiency of the loading process

(6) DS1 MTCE completion:

- i) Provide a DS1 line diagnostic for DTC/LTC's.
- ii) Provide a digital trunk diagnostic for DTC/LTC's.

(7) AUDITS:

- i) Restore the trunk audit TSI-check for DTC/LTC trunks
- ii) Resolve the REFTRM primitive for LTC/DTC's.

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	NPE - PM LOADER
Feature no	F3107

NPE - PM Loader

FEATURE DESCRIPTION

a) INTRODUCTION

The basic loader implemented in this feature will permit downloading of a new peripheral (LGC, DTC, MSB, LCM). The loader in this context refers to the piece of CC software responsible for sending to the peripheral the data contained in the load file, and also sending the execs based on the exec lineups that are supported by the terminal types on the node.

In this feature, loading from the the CC will be supported, with the loader resetting and sending a status message to the peripheral before transferring the loadfile across. A run message will then cause the peripheral to initialize. The peripherals still require static data and the LGC and DTC execs.(the MSB does not have execs). When loading and initialization have been completed successfully, the static data and then execs must be sent to the peripheral. Downloading and modifying static data is the responsibility of the individual maintenance subsystems, since static data is peripheral dependent. For each terminal type supported by the node being loaded an exec-lineup will define the execs to be sent.

b) LOAD PM

XPMPATCH, used to selectively increment an XPM (LTC, DTC, MSB, CSC) loadfile. Given a patch file and a source loadfile, XPMPATCH will generate a third loadfile that consists of the source loadfile incremented by the changes in the patch file.

A patch file contains a number of load-segments which are intended to replace corresponding load-segments of the source loadfile. The patched loadfile that is created by XPMPATCH is essentially a copy of the source loadfile with a few replaced segments in place of the original ones. The RTSS portion of the XPM loadfile may also be incremented. The source loadfile is left untouched by the patching process and can be incremented with a different patchfile if required. Alternatively, patched loadfiles created by XPMPATCH may be themselves be incremented.

The patch and source files may be on disk, tape or SFDEV with the restriction that they are both not on the same tape. The devices used must

have been listed prior to running XPMPATCH. The destination device of the newly created patched-loadfile must be entered by the user.

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	DIAL TONE SPEED RECORDING FOR LCM
Feature no	F3118

FEATURE DESCRIPTION

a) INTRODUCTION

Dial tone speed recording (DTSR) is available for any type of line connected via the LGC. This capability is referred to as LGC DTSR.

b) DESCRIPTION

Dial Tone Speed Recording (DTSR) is used to measure the ability of the switch to return dial tone within a reasonable period of time (under 3 seconds), particularly when the switch is under heavy load. Regulations require that this information be gathered and made available for analysis.

DTSR already exists for timing calls on LMs; feature V1103 covers the development of similar facilities for timing calls for all lines connected via the LGC.

Feature V1103 only covers for lines connected to the LGC via a (local) LCM.

The main components of dial tone delay are :

1. Time taken for the origination to be recognised by call processing.
2. Time taken to allocate resources (e.g. channels, tone receivers).
3. Time taken to setup dial tone itself.

The timings are not constant for a switch - they depend upon the type of set (e.g. Dial Pulse), the location of the associated line card (local or remote) and the method of connection to the CC (e.g. LCM,LGC/LCM). All lines fall into one of a small number of classes, each of which has a significantly different timing profile.

Currently there are two such classes: Dial Pulse (DP) and DigiTone (DT). Three new classes, as shown below, will be added. The design will allow for further classes to be added without major change.

DTSR information is gathered and stored as Operational Measurements (OMs). DTSR OMs are recorded in two tables. Table DTSR is used to contain DTSR counts for the Host. Table SITE is used to contain DTSR counts about each

remote site. The DTSR table is dedicated to DTSR counts, whilst the SITE table contains information used by other CC software.

DTSR counts are held in pairs. One is the count of all calls, the other is the count of those with a dial tone delay exceeding 3 seconds.

There are currently two pairs of counts for each site including the Host. One is for DP calls, the other for DT calls.

Feature V1103 will introduce three new pairs of counts: DP and DT (as for LM DTSR) and KS for the intelligent Key Sets (e.g. PPhone and DU). These new counts will all be double precision to allow the counts to exceed 65535. This means that each will appear as two fields in the display of those OM tables.

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	ADMINISTRATION
Feature	NPE - OM FOR LGC/DTC
Feature no	F3350

FEATURE SYNOPSIS

The OM system has been enhanced to include special operational measurements for LGC and DTC.

Feature Description

A new OM table called PM2 has been added to DMS-100F system to store the following counts:

- 1) Errors (software errors, link timeouts)
- 2) Faults (persistent fault after diagnostics)
- 3) Initialization
- 4) Reloads
- 5) Unit system busy usage
- 6) Unit man busy usage
- 7) Module system busy usage
- 8) Module man busy usage
- 9) Control transfer
- 10) Emergency control transfer
- 11) CCTSB - number of system busy requests on PM terminals
- 12) CCTMB - number of man busy requests on PM terminals
- 13) CCTFL - this count is incremented when a p-side link diagnostic determines a persistent fault
- 14) CCTER - this count is incremented when an unsolicited error message for the p-side link is reported.

RFF 350

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S631

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	LOADER ENHANCEMENTS
Feature no	F3407

FEATURE DESCRIPTION

Introduction

This feature will provide the following enhancements for the NPM Loader:

- Parallel loading capability
- Improved loading efficiency
- Buffering loadfile storage devices
- LoadPM PM option
- Loading of TMs
- 247 byte load messages for CSC
- SWACT execs loading
- Support LDPMALL command for LTC, MSB, LCM, TM node types

While the Basic NPM loaders provided for the XPMs (C0671) and the LCM (C0499) are sufficient for offices with only a few NPMs, an efficient parallel loading scheme is required for offices with a greater number of NPMs. The switching of TMs to the new maintenance process structure makes this requirement even more important.

Description

A summary of each of the enhancements provided by this feature follows:

Parallel Loading Capability:

The ability to set up parallel tasks is inherent to the new maintenance process structure and a form of parallel loading for NPMs already exists. By using either the 'NoWait' option or several terminals, a number of loader tasks can be started to run in parallel. Aside from the fact that it is cumbersome and time consuming for use with more than a few peripherals at a time, this technique has a more basic problem with it. This method is very inefficient when used to load more than one peripheral from the same loadfile. Almost 75⁴ of the loaders time is spent reading records from the loadfile and building the load messages, and this work is done by each of the loader tasks. Another problem is that having several loader tasks accessing the same loadfile puts a lot of strain on the disk (and is not even possible if the file is on a tape).

Clearly, a more efficient scheme would be to do in parallel only those functions in which parallelism is required, such as messaging to the peripherals. If several PMs requiring the same load were to be loaded in parallel, each record would be read from the device and built into a load message only once. Each parallel loader task would access the same message, send it off to their respective PMs, and wait for a reply. The new maintenance process structure lends itself very well to this type of parallel messaging. From a real-time perspective, the less work that is done in parallel the greater the number of parallel tasks that can be running.

This feature will split the loading process into two functional parts, a loadfile processing task and a messaging task. The loadfile processing task will run as an auxilliary task and be created on a per loadfile basis. The messaging tasks will run on the main maintenance process and be created on a per loadable unit basis. For example, if both units of LTC 0 and LTC 1 were to be loaded with the same loadfile, ONE loadfile processing task and FOUR parallel messaging tasks would be created.

Improved Loading Efficiency:

As mentioned in the preceeding section, the parallel loading capability should result in much greater efficiency when several peripherals are loaded in parallel with the same loadfile. However, that scheme does not seem to help us much if, for example, a unit of an MSB and unit of an LTC were to be loaded in parallel. In this enhancement, the efficiency of each part of the loading process will be improved. Both the loadfile processing task and the messaging task will be restructured to use less CPU time, based on the real-time studies conducted in BCS12.

Buffering Loadfile Storage Devices:

Currently, when loading from tape all interaction with the tape system is done via an auxillary task (ie. one which can tolerate real-time breaks). When loading from disk it is the main task (which cannot tolerate real-time breaks) which interacts with the disk system. This causes problems in that the disk software will generate SWERRs if the disk is accessed by a process that cannot wait (even though the disk software might not actually be taking real-time breaks at the time). Another problem with the current technique is that it treats loading from tape as a special case. This "enhancement" will cause all loadfile storage device interaction to be done by an auxillary task, thus eliminating the SWERRs and making the loader device independant.

Load PM PM Option:

The ability to load both units of an XPM with one command will be provided by this enhancement. This will be accomplished by loading the two units in parallel. When a bootmate facility becomes available for XPMs this will be made use of in the LoadPM PM command, loading one unit from the CC then requesting it to boot its mate.

Loading of TMs:

Trunk Modules (TMs) are incorporated onto the new maintenance process structure and make use of the NPM loader. Since LCMS and STCs use the same Intel-format load records as TMs only small changes will be required to accommodate the NPM loader for TMs. The major difference between TMs and the NPMs is that TMs are single-unit peripherals (therefore no mod_number or extension bytes on messages).

CSC 247 Byte Messages:

The CSC peripheral used for Cellular Radio hangs off an IOC rather than a network and for this reason can handle 247 byte messages. This enhancement will allow the CSC to make use of this large message capability by providing 247 byte load messages when loading a CSC.

SWACT Execs Loading:

Part of the BCS SWACT feature involves the parallel loading of execs in all the pms. This enhancement will support parallel execs loading on BCS SWACT for NPMs.

LDPMALL Command for LTC, MSB, LCM, TM node types:

The existing LDPMALL command provides a facility for loading all the pms of a given node type which have a given loadfile name in their inventory table. This command was supported for DCMs, LMs, and TMs. This feature extends LDPMALL to include LTCs, MSBs, and LCMS. TMs will continue to be supported but will be using the new loader that runs on the mtce. main process.

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	NPE - LM SPEECH LINK DIAGNOSTICS
Feature no	F5405

FEATURE SYNOPSIS

This feature provides a speech test for the links between a line module and a network. The test may be initiated either manually from the MAP or by the system when it detects a problem with a LM speech link.

FEATURE DESCRIPTION

When the LM speech link test is initiated, it seizes the phantom terminal reserved for the link being tested along with a free channel on that link. A loop-around connection is then made at the network end and network integrity signal is sent from the LM towards the network on the seized channel. The integrity signal when it returns will be detected by the LM. The speech test is considered a failure if the LM fails to report within 10 seconds.

The links between a network and a LM can be tested simultaneously from a man machine interface point of view, but the same link cannot be tested on both planes at the same time. The LM speech link diagnostic is similar to that for the TM and DCM except for the seizure of a phantom terminal which is unique to the LM.

References

FDOC BF0698 - LM Enhancements to support NET/PM speech link diagnostics

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	PM MAP ENHANCEMENTS
Feature no	F5497

FEATURE SYNOPSIS

This feature is an enhancement to the usage and flexibility of PM logs and PM log updates.

FEATURE DESCRIPTION

MTC task will no longer format PM logs thus making better use of high priority time. Each PM data will now have a count associated with the MAP posting the PM. This count may be used to determine if a MAP update is required. The MTC task will no longer format data for MAP updates also making better use of high priority time.

Ref: FDOC BC1184

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	XPM REALTIME ENHANCEMENTS
Feature no	F5734

FEATURE SYNOPSIS

This feature will decrease the processing time required per call thereby resulting in the real time capacity improvement of the XPMs.

FEATURE DESCRIPTION

This feature will optimise select sections of LTC call processing code in order to improve the real time efficiency. Changes will be made in the following sections of the call processing code:

- a) PASCAL SET OPERATOR REMOVAL
- b) DISPLAY DATA BLOCK CODE
- c) DATA UNIT MESSAGING

The code optimisation will result in an estimated overall capacity improvement of 6.5⁴ in LGC (old and new messaging) and 4 in DTC (old and new messaging).

References

BF0954 XPM Realtime Enhancements

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	XPM ROUTINE EXERCISE TEST
Feature no	F5813

FEATURE SYNOPSIS

This feature implements a regular routine exercise (REX) program for XPM type peripherals (LGC, RCC, MSB etc). The program is split into two component parts; the REX schedules code and the general XPM exercise code.

FEATURE DESCRIPTION

The REX schedules commences at the same (START) time daily and cycles through the XPMs in the office until the STOP time is reached. Both START and STOP times are selectable by the Telco.

The exercise performed on each XPM peripheral combines many of the diagnostic and functional routines, currently available with these PM types, in order to improve fault coverage and reliability.

Logs are generated during the course of the REX test on each peripheral as it is selected by the REX schedules. Operational measurement (OM) pegs and alarms normally generated for certain system actions are suppressed if intentionally activated due to the routine exercise (e.g., SYSBSY of Inactive side of XPM).

Ref: BF0955

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	XPM ROM DIAGNOSTIC MMI
Feature no	F5833

FEATURE SYNOPSIS

This feature will provide a better MMI for the XPM ROM diagnostics. This includes support for a ROM diagnostic command and an improved reporting of the results of the diagnostic.

FEATURE DESCRIPTION

ROM based diagnostics are used in all XPM's. The diagnostics are designed so that one set of ROMS can be used with any XPM processor card (MP, SP, FP, EP)

A new option on the TEST command will be implemented so that the ROM diagnostic can be invoked from the Central Control(CC) map level. If the ROM test fails, the appropriate card list will be output to indicate the faulty card (6X45, 6X46 or 6X47 card). If communication fails between the CC and the XPM, a default card list will be output.(ie. no reply from PM) It should be noted that the ROM test is a destructive test, and can only be run on man busy XPM units. A XPM reload will be required after the ROM test, before the craftsperson will be able to return the XPM unit in to service.

As part of this feature, the LOADPDM command will also be changed to allow the option FORCE. This option will allow the LOADPDM command to load an XPM without running the ROM diagnostics. (ie LOADPDM PM CC LT20ZC FORCE, LOADPDM UNIT 0/1 CC LT20ZC FORCE)

REFERENCE

FDOC BC2015

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	XPM DIAG DRIVER ENHANCEMENTS
Feature no	F5904

FEATURE SYNOPSIS

This feature provides enhanced robustness, fault isolation, throughput, and diagnostic responses from the XPM Diagnostic Driver.

FEATURE DESCRIPTION

Past experience, and recent No Fault Found (NFF) testing have demonstrated that the current XPM diagnostic system has many deficiencies. Three major areas of deficiency have been identified:

- 1.) Diagnostic Coverage
- 2.) Fault Isolation
- 3.) System Throughput

Inadequacies in diagnostic coverage are being addressed separately, on a point by point basis. Inadequacies in fault isolation and system throughput are the motivation for this feature. The primary objectives of this feature are to add isolation capabilities and parallel processing to the diagnostic system. In addition, several known problems with the system will be corrected.

FDOC BF0969

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	DTSR CAPACITY ENHANCEMENTS
Feature no	F6162

FEATURE SYNOPSIS

This feature reduces the real time costs associated with the collection of dial tone speed recording (DTSR) operational measurements (OM) from new peripherals.

FEATURE DESCRIPTION

This feature implements changes to the central control (CC) code in order to reduce the real time costs of DTSR OM collection from line concentrating devices (LCDs) attached to new peripherals (XPMs). (Changes to the peripheral code are performed by feature F6190.) Real time costs are reduced by modifying the collection scheme between the CC and the peripherals. LCDs to which this new collection scheme applies are LCM, RLCM, RCT, RXC, RCU, DLM and RDLM.

Ref: AF0155 FDOC - this feature
AL0227 FDOC feature F6190

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	DTSR REALTIME ENHANCEMENTS
Feature no	F6190

FEATURE SYNOPSIS

This feature reduces the real time costs associated with the collection of dial tone speed recording (DTSR) statistics from new peripherals.

FEATURE DESCRIPTION

This feature implements changes to new peripheral (XPM) software in order to reduce real time costs of DTSR statistics collection from line concentrating devices (LCDs) attached to XPMs. (Changes to CC software are performed by feature F6162.) Real time costs are reduced by modifying the collection scheme between the CC and the peripherals. LCDs to which this new collection scheme applies are LCM, RLCM, RCT, RCS, RCU, DLM and RDLM.

Ref: AL0227, AF0155

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	ENHANCED DS-1 INTERFACE MAINTENANCE
Feature no	F6299

FEATURE SYNOPSIS

This feature improves the software related to monitoring DSIs in XPM such that it is more maintainable and efficient. This will include restructuring, reorganizing and rewriting portions of the software. Enhancements will be included to support features supplied by the NT6X50AB board, such as extended frame format, CRC error monitoring and blue alarm.

FEATURE DESCRIPTION

This feature's purpose is to expand the range of services offered by DS-1 maintenance in the XPM. All XPM loads that currently have DS-1 maintenance, with the exception of the small memory DTC load, will be able to offer these new services. The small memory DTC load that are based on BCS-19 messaging will offer a subset of these services.

Through the support of the new DS-1 interface card (NT6X50AB) feature set, DS-1 maintenance software in the XPM will be able to make available an increased variety of services. This set includes, amongst other functions, extended superframe format (ESF), bipolar eight bit zero substitution (B8ZS) and alarm indication signal (AIS).

This feature will also increase the number of digital signal parameters monitored on each DS-1 link. This additional information will enable the XPM to present a full and accurate picture of the DS-1 link for maintenance and service performance purposes.

Ref: DDOC AL0174, AL0173

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	SMaintenance AND TESTING
Feature	AUDIBLE ALARMS FOR REMOTE CSIDE LINK FAILURES
Feature no	F6400

FEATURE SYNOPSIS

This feature enhances the maintenance of peripherals so that if an LCM goes (ISTB) in service trouble, the specific reason is displayed. A major or a critical is also raised if links to a supported type are lost.

FEATURE DESCRIPTION

Currently the LCM maintenance does not handle individual node ISTB states. In service trouble can be displayed for several reasons. This feature adds the software which specifies why the LCM node has gone ISTB. Individual node ISTB information is added to the PM query fault MAP command and the PM status logs. The LCM node ISTB conditions are now:

- unit out of service
- unit in service trouble
- drawer fault
- C-side link out of service
- P-side link out of service

The first three conditions already cause an LCM to go ISTB while the last two conditions are being added by this feature.

Two in-service trouble conditions are added to raise major or critical alarms due to the loss of links on the C side of a peripheral. All LCM and XPM peripheral types are supported. ESA (emergency stand-alone) is not supported.

Ref: DDOC AG0366

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE
Feature	XPM RTS ENHANCEMENTS
Feature no	F6403

FEATURE SYNOPSIS

The return to service (RTS) sequence of an XPM currently involves two restarts taking approximately 30 seconds each. In some XPM types this restart is not required and can be removed. The objective of this feature is to speed up the RTS of the XPM by removing the second restart thus improving office recovery.

FEATURE DESCRIPTION

This feature will remove the second restart on the following XPM types: LTC, LGC, ILGC, IDTC, MSB7. This feature will not be able for XPMs with small memory configurations.

Ref: DDOC AL0335

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	DECOUPLE CC RELOAD RESTART FROM XPM RESTART
Feature no	F6442

FEATURE SYNOPSIS

This feature will speed up recovery of an XPM after CC reload restart. This feature will only be provided for domestic LGC, LTC and DTC equipped with new messaging card.

FEATURE DESCRIPTION

In BCS-23, the audit XPM data feature (BC1228) was implemented to detect data corruption and reduce the elapsed time to RTS an XPM if the data in the XPM is valid.

At present, during CC reload restart the XPM is restarted and provided with static data. As the validity of the static data in the XPM is ensured by the static data audit, this feature will eliminate the requirement to download static data after CC reload restart and hence reduce the office recovery time (i.e., the units will be restarted and RTS without downloading static data).

Ref: BC1228

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	NT6X50AB - MAP SUPPORT
Feature no	F6505

FEATURE SYNOPSIS

This feature will provide enhanced CC support for the 6X50AB carrier interface card for XPM DS1 carrier connected to the p-side of XPMs. Changes will be made to:

- MAP carrier level
- carrier return to service (Rts) and test (Tst)
- carrier audit
- carrier operational measurement (OM)

Note that with some limitation the changes also apply to the 6X50AA, 6X85AA and 6x85AB cards. In addition, the 6X85AA and 6X85AB are treated as the 6X50AA by the CC carrier maintenance software.

FEATURE DESCRIPTION

This feature provides the CC enhancements described below.

MAP Carrier Level:

New DS1 associated alarm and count facilities provided by the 6X50AB are supported (in addition to existing 6X50AA capability). It will be possible to apply a looparound at the card interface for improved testing of carrier facilities. New MAP MMI commands will enable overall interrogation of options provided for each carrier facility, and initiation of looparound.

Carrier Rts and Tst:

When an entry in table CARRMTC is changed, affecting options sent to the associated XPMs, the status of the associated XPMs will be left unchanged. A XPM's status will also be left unchanged when the carrier index into CARRMTC is changed for a DS1 carrier on an XPM.

Carrier OM:

The following new revised counts will be accumulated over 24 hour during the XPM audits as is done at present for frames and slips:

- ES - error second
- SES - severe error second
- UAS - unavailable second
- BER - bit error rate

Carrier Audit:

When the ES or SES threshold is exceeded, the respective Out of Service Limit exceeded (OS) indication will be raised and the carrier made system busy if appropriate.

The OS indication will be cleared when the 24 hour counter is reset, or the carrier is manually returned to service. This treatment is similar to that for out of service limit reached for frame or slip counts.

Ref: FDOC AL0563

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	INTERFACE
Feature	CC SUPPORT FOR NT6X50AA
Feature no	F6506

FEATURE SYNOPSIS

This feature will provide the basic CC support required for the new 6X50AB carrier interface for XPM DS1 carrier including options which will support its use for clear 64 kbps. Included will be:

³ Table control for:

- CARRMTC - new carrier options
- IACPSINV - new CARRMTC index field for IAC carriers
- LTCPSINV - new CARRMTC index field for carriers for DTC, LGC, LTC, SMR, SMS, SMU.
- RCCPSINV - new CARRMTC index field for RCC p-side carriers.

³ Data download for XPMs on the c-side of the carrier.

FEATURE DESCRIPTION

This feature will allow the table CARRMTC of carrier attributes to include the following new fields applicable to the 6X50AB:

³ CARD - NT6X50AA or NT6X50AB

³ FF - Frame format:

- SF - standard format
- ESF - extended superframe format

³ ZLG - zero logic:

- ZCS - zero code suppression
- B8ZS - bipolar 8-bits zero substitution

³ BERB - bit error ratio base:

- BPV - bipolar violation
- CRC - cyclic redundancy code

³ DLK - data link:

- NILDL - nil
- SLC96 - subscriber loop carrier for 96 subscribers
- FDL1 - facility data link: input from time slot 2
- FDL2 - facility data line: input from external interrupt

This feature allows only NILDL, as the XPMs do not support the other options at this time.

³ IAT - inhibit alarm transmit (Y/N)

- ³ LCGAST - local carrier group alarm set threshold
- ³ LCGACL - local carrier group alarm clear threshold
- ³ RCGAST - remote carrier group alarm set threshold
- ³ RCGACL - remote carrier group alarm clear threshold
- ³ AISST - alarm indication signal set threshold
- ³ AISCL - alarm indication signal clear threshold
- ³ BERML - bit error rate maintenance limit threshold
- ³ BEROL - bit error rate out of service limit threshold
- ³ ES - errored second limit
- ³ SES - severe errored second limit

In addition, the default tuples corresponding to CARRMTC index 0 for the various PMS in CARRMTC cannot be deleted, and the only options which can be changed in the default tuples are the ones which are not sent to the associated PMS, viz., ES and SES and the existing thresholds for slips and loss of frame.

The P-side DS1 carriers of the XPMs will now have a new field for the CARRMTC index in tables IACPSINV, LTCPSINV and LTCPSINV. This index can be changed only when the carrier is MANB or OFF1.

When a XPM is returned to service, the information associated with all the CARRMTC tuples used by its p-side carriers along with the CARRMTC indices associated with each carrier will be sent to the XPM with the static data.

Ref: DDOC BC2093

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESING
Feature	XPM SYNC DIAGNOSTIC
Feature no	F6601

FEATURE SYNOPSIS

This feature provides a diagnostic which detects and reports problems with the Speech Bus Formatter and Host Link Formatter circuit packs.

This is an enhancement to the existing XPM Sync Software fault detection mechanism. The diagnostic is triggered by reporting of sync operational faults.

FEATURE DESCRIPTION

The transmission of all messages and speech between an XPM and the network (and an XPM and its' mate unit) is dependant on the integrity of the frame pulses generated by the XPM formatter card. Operational faults may occur if this frame pulse does not coincide with the network frame. Currently, these frame faults are detected by the sync software and reported to the XPM resident maintenance but not diagnosed. Thus the detailed reporting and diagnosis of these faults is the subject of this feature.

In the existing sync software there are two basic strategies used for fault detection involving the sync hardware phase comparators. One method is used to indicate operational failures such as link insanity. In the other method an operational failure is interpreted as a stuck phase comparator. In both these strategies, once failure is recognized, a C-side communication failure is reported to XPM maintenance and system recovery attempts are initiated to ensure that sync is maintained. There is no diagnostic messaging to the CC, simply a reporting of the failure. These operational faults are currently reported to the CC.

This diagnostic uses the results of these reported operational faults and along with the information available since the last diagnostic run, determines the sanity of the sync hardware. Thus information which indicates sync hardware failure will result in a diagnostic failure message being sent to the CC indicating the faulty circuit pack.

Ref: DDOC AG0664FN - XPM Sync Diagnostic

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE AND TESTING
Feature	BETTER CC INTERPRPETATION OF MESSAGING FAILURES
Feature no	F6603

FEATURE SYNOPSIS

This feature reduces the card list generated in response to a CC-XPM communication failure from 8-10 cards to 4-5 cards.

FEATURE DESCRIPTION

Currently, CC diagnostic actions in response to a communication failure to CC-XPM results in a default card list of between 8-10 cards being output at the MAP terminal.

This feature produces a reduced card list by intelligent interpretation of XPM responses. This will reduce the time required to isolate the faulty card.

Ref: DDOC AL0477FN

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	ADMINISTRATION
Feature	ISDD PART 2
Feature no	F7122

FEATURE SYNOPSIS

This feature provides the Operational Measurement (OM) pegs to calculate Incoming Start-to-Dial Delay measurements for trunks supported by Digital Trunk Controllers, Line Trunk Controllers, and Remote Cluster Controllers.

Incoming Start-to-Dial Delay measurements can be used to determine the Grade of Service being offered for incoming trunk services on the DMS-100 family of digital switches.

FEATURE DESCRIPTION

Incoming Start-to-Dial Delay (ISDD) is the time interval between an incoming trunk seizure and the completion of the trailing edge of the start-to-dial signal that is returned. A delay is pegged if the time interval is greater than a preset threshold time. The default threshold is three seconds.

The ISDD OM group is made up of four pegs: seizures, call attempts, start-to-dial delays, and abandons.

These pegs are accumulated separately for the three standard signaling types: dial pulse, digitone, and multi-frequency. All other signaling types are classed under the heading 'other'.

Ref: FDOC AG0917

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	ADMINISTRATION
Feature	XPM ROM DIAGNOSTIC IMPROVEMENTS
Feature no	F7125

FEATURE SYNOPSIS

This feature increases the capabilities of the XPM ROM (Read Only Memory) diagnostics. These diagnostics can detect a wider range of faults in the XPM processor complex, perform better fault isolation, require less time to test the processing complex, and provide non-destructive tests.

This feature also provides facilities for improving the MMI to the ROM-based diagnostics.

FEATURE DESCRIPTION

The ROM diagnostics are implemented in firmware on the XPM processor card.

The purpose of the ROM diagnostics is to verify that the hardware in the XPM unit is capable of receiving a software load from a load source, storing it in the XPM RAM (Random Access Memory), and then executing the RAM stored software load.

The ROM diagnostics test the functionality of each of the processors in a single, double, or triple processor XPM unit. The RAM associated with each of these processors is tested for faults.

The ROM diagnostics also test the messaging capabilities of the messaging processor card and its associated RAM.

Reload Requirements After ROM Testing

The ROM diagnostics test the RAM cards in a manner that does not destroy the software load that is contained on those cards.

Diagnostic Execution Time

The RAM test portion of the ROM diagnostics requires less time to perform its functions.

Interim Diagnostic Progress

The diagnostics send interim replies to indicate the progress of the individual diagnostic tests. The diagnostics also send an acknowledgement as soon as they are called.

Fault Detection

The diagnostics, upon detection of a subtest failure, carry on with other subtests in order to isolate a fault to a particular component. Upon completion of all of the tests, the results of the individual subtests are correlated to produce a concise list of suspected faulty card(s).

The diagnostics detect faults in the interrupt control circuitry that cause spurious interrupts to be raised. These diagnostics also test the interrupt circuitry to ensure that all software controlled interrupts are capable of being raised at appropriate times.

The diagnostics detect any fault in the Direct Memory Access circuitry that prevents another processor from accessing Master Processor memory. If any memory access or bus access related faults are detected, the diagnostics signal a fault, and carry on with the fault isolation process.

These diagnostics test the internal registers, various addressing modes, and the functionality of the arithmetic and logic unit of the CPU used on the 6X45 cards. These tests ensure that the CPU is capable of processing data in the correct manner.

To facilitate the diagnosis of the XPM messaging function, the diagnostics perform tests on the components of the processing complex that perform messaging functions.

Ref: FDOC AL0474

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE
Feature	XPM IPML MESSAGING FOR OFFICE RECOVERY
Feature no	F7132

FEATURE SYNOPSIS

This feature enables Inter-Peripheral Message Link(IPML) messaging between any two XPMs.

FEATURE DESCRIPTION

Inter-Peripheral Message Link messaging means that an IPML link can be set up between two XPMs of the same type or of different types.

Once the IPML link is set up, task level applications in either XPM can use the link to send any type of call processing or maintenance message to the other XPM.

The IPML feature can be used to load many XPMs simultaneously.

Ref: FDOC AG0309

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	MAINTENANCE
Feature	XPM BOOTSTRAP IMC/IPML MESSAGING ENHANCEMENT FOR N
Feature no	F7133

FEATURE SYNOPSIS

This feature provides ROM level messaging capability for the Inter-Module Communication (IMC) Link and the Inter-Peripheral Message Link (IPML).

FEATURE DESCRIPTION

The IMC link allows an XPM unit at ROM level to be loaded or fault diagnosed by its task level mate unit.

The Central Control tells the ROMs which IPML links to receive or transmit messages on by sending an IPML setup message to the XPM. IPML messaging allows an XPM unit at ROM level to broadcast messages throughout the network to several other XPMs.

This feature is available on 6X45BA (and higher) processor cards. It will only work in XPMs equipped with NT6X69 messaging.

Ref: FDOC AG0310

Package	NTX270AA12 NEW PERIPHERAL MAINTENANCE PACKAGE
Feature set	ADMINISTRATION
Feature	CC MANUAL SUPPORT FOR DEAD SYSTEM RECOVERY
Feature no	F7228

Synopsis

The CC Manual Support for Dead System Recovery feature improves the manual process for returning a DMS-100 switch to service after a total or partial outage due to loss of power to the switch. This feature speeds up the process of returning a switch to service by allowing the Operating Company to return a set of LCMs to service, and load and return to service a set of XPM peripheral modules.

Implementation

This feature adds an 'ALL' option to the following LCM maintenance commands:

- * Busy (BSY)
- * Return to Service (RTS)
- * Offline (OFFL)
- * Test (TST)
- * Loading (LOADPM).

If a command is implemented with the 'ALL' option, the maintenance operation will be executed on each LCM in the post set with a peripheral module (pm) type the same as the current LCM displayed on the MAP.

This feature adds a new option, PMTYPE, to the NEXT command to allow movement to the next pm type in the post set.

This feature adds a new command, RECOVER, for XPM peripheral modules. RECOVER loads and returns to service a set of XPM peripheral modules. The RECOVER command operates on the set of XPMs in the post set that have the same pm type as the XPM currently displayed on the MAP.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature interacts with the following:

- * existing PM MAP level software
- * existing PM Maintenance software
- * IPML PM Loader MTC Utilities feature
- * Enhance PM MAP Level feature
- * XPM 6X45BA Maintenance Enhancements feature

Restrictions

The RECOVER command is not available for Cellular Site Controller XPMs.

The RECOVER command is available only to XPMs with 6X45BA hardware.

The RECOVER command returns only one unit of each XPM to service.

Reference

FDOC AG1241

NTX272AA02 Status: RTM FOCUSSED MAINTENANCE

MAINTENANCE	:	
FOCUSED MAINTENANCE		F3829
FOCUSED LINE MAINTENANCE		F3830

Package	NTX272AA02 FOCUSED MAINTENANCE
Feature set	MAINTENANCE
Feature	FOCUSED MAINTENANCE
Feature no	F3829

FEATURE SYNOPSIS

The purpose of the new maintenance feature is to provide a MAP oriented approach to the maintenance of trunks as an alternative to the existing logs system.

FEATURE DESCRIPTION

This feature will provide trunk maintenance capability via two main functions; thresholding and alarm generation on trunk troubles, and buffering of trunk trouble information.

Thresholding

The generation of alarms will be caused by trunk troubles identified in software exceeding Telco defined thresholds. A failure count will be pegged on all software failure paths which will be measured against the Telco defined levels to determine which, if any, alarm should be generated. The Telco will be able to datafill TRKMTCE for minor, major and critical alarms as percentages of a successful call attempt value. This successful call attempt value will be known as an N value which represents the number of call attempts which must take place on a trunk before the failure count for that trunk is decremented by one. In other words, the trunk is given a credit of one for every N attempts which take place over that trunk. This credit is provided by decrementing the failure count on that group by one if it is non-zero.

Alarm generation will be implemented by a thresholding process running once every 30 seconds. The purpose of the thresholding process is to establish when the failure count of a trunk group exceeds the Telco defined alarm thresholds. The thresholding process generates the appropriate alarm based on the current trouble count and the alarm threshold levels data filled for that trunk group. There are three different sources from which trouble reports may be generated; manual action by a craftsperson, system initiated maintenance processes, and call processing. The algorithm is slightly different for each of these trouble report sources. The thresholding process will perform its function for call processing troubles according to the following algorithm:

- 1) compare adjusted failure count to maintenance and call processing critical alarm threshold levels. If count \geq critical then go to 5.
- 2) compare adjusted failure count to maintenance and call processing major alarm threshold levels. If count \geq

- major then go to 5.
- 3) compare adjusted failure count to maintenance and call processing minor alarm threshold levels. If count \geq minor then go to 5.
 - 4) get the next trunk group counter, i.e. no alarm condition go to 1.
 - 5) if there exists an alarm of a higher priority currently activated then do nothing. go to 1. If there exists an alarm of the same priority currently then refresh the wakeup, go to 1. If no alarm is presently activated then generate the appropriate alarm level with a 15 minute wakeup, go to 1.

The call processing code will peg call attempts over trunks in the trunk allocator for incoming trunks and the trunk selector for outgoing trunks. These are the same locations that the corresponding OM's are pegged. This attempt count is only necessary for trouble reports generated by call processing and is used to adjust the failure count to more accurately represent the failure level on each trunk group.

The alarm level threshold levels entered by the Telco represent a percentage of N. The values entered by the Telco are translated to an absolute trouble count depending on the current value of N before being compared to the adjusted failure count.

Table TRKMTCE will contain the call processing and maintenance trouble thresholds and the N-value. These will be datafilled in the fields CPMINALM, CPMAJALM, CPCRTALM, MTMINALM, MTMAJALM, MTCRTALM, and ATMPCNT.

Thresholding on troubles reported by maintenance processes is slightly different in that attempt counters are not maintained. The alarm thresholds in table TRKMTCE represent absolute values of maintenance reported troubles. The failure count will be pegged by the buffering procedure and the alarms will be generated by the thresholding process. There will, however, be no adjustment of the failure count according to the attempts. In addition the failure count will not be pegged on reports which indicate a trunk has passed a test.

No thresholding will be performed on trouble reports generated due to craftsperson action. These reports will not peg a failure count or attempt count but will be buffered in the maintenance upper buffers.

On generation of an alarm a 15 minute wakeup will be initiated during which the alarm level may not decrease except when manually cleared. If a higher priority alarm is generated it will be set with a refreshed 15 minute wakeup.

Buffering

The buffering capability will place trunk trouble information in buffers on a per trunk group basis and trunks will be identified by their member number within the buffer. The Telco will have the capability to allocate buffers for each trunk group in the office. These buffers will be accessible via the MAP.

For each trunk group two groups of buffers will exist to identify the members with the problem. One group will be for problems reported by maintenance processes and the other group will be for problems reported by call processing. Each group will consist of a pair of buffers. One of these buffers will be a trouble buffer which may contain up to ten entries representing the ten worst members of the group (this buffer will be referred to as the upper buffer for the remainder of this document). The other buffer may contain up to five entries and will be used to screen out members with only one occurrence of a problem (this buffer will be referred to as the lower buffer).

Store for the two groups of buffers may be allocated selectively by the table control of table TRKMTCE. Both maintenance buffers and call processing buffers may be allocated, or neither or only one of the two types if desired. When a group of buffers desired, the store for the upper and lower buffers will be allocated in the following manner. One buffer will be of size ten entries. This buffer will contain the ten most recent, worst members of the trunk group. This means that the trunk group members which have the highest failure count (greater than one) and have these failures most recently in time may be found in this buffer. The other buffer will be of size five entries and will be used to screen out members with less than two troubles. Two fields in table TRKMTCE will be used to allocate or DEALLOCATE the buffers. The field CPBUFRQD will allocate the call processing buffers and MTBUFRQD will allocate the maintenance buffers. Both these fields will take the values 'Y' or 'N'. Buffers may not be deallocated while a continuous buffer display is in progress in the TRKSTRBL level at any MAP.

The contents of the upper buffer structure will be as follows:

- i) identification of the group member (trunk member number)
- ii) time of the last trouble (yr/mon/day/hr/min/sec)
- iii) count of the troubles on that member (integer)

The contents of the lower buffer structure will be as follows:

- i) identification of the group member (trunk member number)
- ii) time of the last trouble (yr/mon/day/hr/min/sec)

The contents of the buffers will be accessible through the TTP and a new MAP level called TRKSTRBL. The new MAP level TRKSTRBL will be placed below the TRKS level parallel to the present STAT level. New commands will be made available in the new TRKSTRBL MAP level and enhancements

will be made to commands existing in the TTP level. These commands are documented in the MMI section of this document.

When a trouble occurs on a trunk group member during call processing, maintenance processing or manual action where a log report is presently generated a buffering procedure will be called to update the trouble buffers associated with that member. This procedure will search the upper buffer of the group for an instance of the member with the problem. If the member is found in the upper buffer, the last trouble time and the trouble index fields of the entry will be updated. In addition, the trouble count field of the entry will be incremented by one. If the member is not found in the upper buffer the procedure will search the lower buffer for the group member. If the member is found the entry in the lower buffer will be moved into the upper buffer. The entry being moved will either fill an empty spot in the ten entry buffer if one is available or overwrite the oldest entry. If the group member is not found in the lower buffer, it will be placed there by filling an empty spot or overwriting the oldest entry (if no empty spot is available). Note that trouble information generated from manual action is placed directly in the upper buffer of the required trunk group and no entries are screened out by the lower buffer.

This feature will divide troubles found on trunks into three categories, troubles generated by call processing, troubles generated by maintenance processes and trouble information generated by manual action. The trouble information generated by call processing and maintenance processes will be buffered and subject to alarm generation. Separate alarm level definition and buffering will be available to the Telco for these two types of trunk troubles. Trouble information generated as a result of manual action will be placed directly in the maintenance upper buffer and will have no effect on alarm generation.

The purpose of the thresholding process is to generate alarms when the trouble count of trunks exceeds Telco defined threshold levels. This feature will include the displaying of these alarms at the MAP when generated. These alarms will be displayed by severity in the TRKSTRBL level and this display will be updated every minute.

The buffering process places trouble information in buffers associated with trunk group CLLIs. In BCS15 these buffers applied only to trunks generating troubles from call processing. This feature will implement the buffering process for trunks generating trouble reports from maintenance processes and manually initiated trunk trouble information.

In addition to the generalizing of the thresholding and buffering processes to include maintenance activities this feature will implement data dictionary storage of possible trouble types used by the buffering process and by the MMI to give the craftsperson a clue to the problem encountered by the trunk.

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Package	NTX272AA02 FOCUSSED MAINTENANCE
Feature set	MAINTENANCE
Feature	FOCUSED LINE MAINTENANCE
Feature no	F3830

FEATURE SYNOPSIS

The purpose of this feature is to provide a MAP oriented approach to the maintenance of lines as an alternative to the existing logs system.

FEATURE DESCRIPTION

This feature will provide line maintenance capability via two main functions: thresholding and alarm generation on line troubles, and buffering of line trouble information. This feature will provide the above mentioned capabilities for line troubles generated by call processing.

Thresholding

The generation of alarms will be caused by line troubles identified in software exceeding Telco defined thresholds. A failure count will be pegged on all software failure paths. This failure counter will be measured against the Telco defined levels to determine which alarm, if any, should be generated. The Telco will be able to datafill a new table called LNSMTCE for minor, major and critical alarms as percentages of a successful call attempt value. This successful call attempt value will be referred to as the N value for the remainder of this document. The N value will represent the number of call attempts which must take place before the failure count for the line concentrating device (LCD) on which the line exists is decremented by one. In other words, an LCD is given a credit of one for every N attempts which take place on lines on that LCD. This credit is provided by decrementing the failure count on that LCD by one if it is non-zero.

Alarm generation will be implemented by a thresholding process running once every 60 seconds. The purpose of the thresholding process is to establish when the failure count of an LCD exceeds the Telco defined alarm thresholds. The thresholding process generates the appropriate alarm based on the current trouble count and the alarm threshold levels datafilled for the specific LCD. On generation of an alarm a 15 minute wakeup will be initiated during which the alarm level may not decrease except when manually cleared. If a higher priority alarm is generated it will be set with a refreshed 15 minute wakeup. The thresholding process will calculate and generate alarm levels for each LCD according to the following algorithm:

- 1) compare adjusted failure count to critical alarm threshold level.
if count \geq critical then go to 5.

- 2) compare adjusted failure count to major alarm threshold level.
if count >= major then go to 5.
- 3) compare adjusted failure count to minor alarm threshold level.
if count >= minor then go to 5.
- 4) get the next LCD adjusted failure count since no alarm condition exists. go to 1.
- 5) if there exists an alarm on the specific LCD of a higher priority currently activated then do nothing. go to 1.
if there exists an alarm of the same priority currently then refresh the 15 minute wakeup, go to 1.
if no alarm is presently activated then generate the appropriate alarm level with a 15 minute wakeup.
go to 1.

The alarm level threshold levels entered by the Telco represent a percentage of N. The values entered by the Telco are translated to an absolute trouble count depending on the current value of N before being compared to the adjusted failure count.

Table LNSMTCE will contain the call processing trouble thresholds and the N value. These will be datafilled in the fields CPMINALM, CPMAJALM, CPCRTALM, and ATMPCNT.

The call processing code will peg call attempts on lines in the line allocator for incoming lines and in the line cross processors for terminating lines. These are the same places the corresponding OM's are pegged. This attempt count is used to adjust the failure count to more accurately represent the failure level on each LCD.

Buffering

The buffering capability will place line trouble information in buffers on a per LCD basis and lines will be identified by their line equipment number (len) within the buffer. The Telco will have the capability to allocate buffers for each LCD in the office. These buffers will be accessible via the MAP.

For each LCD a pair of buffers will exist to identify the lines with problems. One of these buffers will be a trouble buffer which may contain up to 10 entries representing the 10 worst lines on the LCD (this buffer will be referred to as the upper buffer for the remainder of this document). The other buffer may contain up to 5 entries and will be used to screen out lines with only one occurrence of a problem (this buffer will be referred to as the lower buffer).

Store for the buffers may be allocated selectively by the table control of the new table LNSMTCE. The buffers to contain the trouble information generated by call processing may be allocated or deallocated by changing a field in table LNSMTCE. When the buffer pair is desired the store for the upper and lower buffer will be allocated in the following manner. The upper buffer will be of size 10 entries. This buffer will contain the 10 most recent worst lines on an LCD. This means that the lines which have the highest failure count (greater than one) and have these failures most recently in time may be found in this buffer. The lower buffer will be of size 5 entries and will be used to screen out members with less than two troubles. The field CPBUFRQD in table LNSMTCE will be used to allocate or deallocate the buffers. This field will take the value Y or N. Buffers may not be deallocated while a continuous buffer display is in progress in the LNSTRBL level at any MAP.

The contents of the upper buffer structure will be as follows:

- i) identification of the line (len)
- ii) time the last trouble (yr/mon/day/hr/min/sec)
- iii) count of the troubles on that line (integer)
- iv) brief text trouble description

The contents of the lower buffer structure will be as follows:

- i) identification of the line (len)
- ii) time of the last trouble (yr/mon/day/hr/min/sec)

The contents of the buffers will be accessible through the LTP and a new MAP level called LNSTRBL. The new MAP level LNSTRBL will be placed below the LNS level parallel to the LTP. New commands will be made available in the new LNSTRBL MAP level and enhancements will be made to the post command in the LTP level. These commands are documented in the MMI section of this document.

When a trouble occurs on a line during call processing where a log report is presently generated a buffering procedure will be called to update the trouble buffers associated with the LCD on which that line exists. This procedure will search the upper buffer of the LCD for an instance of the line with the problem. If the line is found in the upper buffer the last trouble time and the trouble description fields of the entry will be updated. In addition, the trouble count field of the entry will be incremented by one. If the line is not found in the upper buffer the procedure will search the lower buffer for the line. If the line is found the entry in the lower buffer will be moved into the upper buffer. The entry being moved will either fill an empty spot in the upper buffer if one is available or overwrite the oldest entry. If the line is not found in the lower buffer it will be placed there by filling an empty spot or overwriting the oldest entry if no empty spot is available.

The purpose to the thresholding process is to generate alarms when the trouble count of an LCD exceeds Telco defined threshold levels. This

feature will include the displaying of these alarms at the MAP when generated. These alarms will be displayed by severity in the LNSTRBL level and at the MTC level as LNS alarms. The alarm displays will be updated every 30 seconds.

The buffering process places trouble information in buffers associated with LCDs. These buffers will contain trouble information pertaining to lines generated by call processing.

In addition to the thresholding and buffering of line trouble information this feature will also implement data dictionary storage of possible trouble types used by the buffering process and by the MMI to give the craftsperson a clue to the problem encountered on the line.

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NTX273AA07

Status: RTM MULTI - PROTOCOL CONTROLLER BX.25

MPC	:	
MPC - OS		F3833
MPC - COMMAND INTERPRETER		F3834
MPC - IOC HANDLER		F3835
MPC - DATA LINK HANDLER		F3836
MPC - BX.25 LEVEL3		F3838
MPC - BX.25 LEVEL2		F3839
PROTOCOL SUPPROT BX25		F3913
TABLES,MAINTENANCE I/O FILE SYSTEM		F3914
APPLICATION SUPPORT		F3915
MPC LOGS FOR IOD MAINTENANCE		F5760
MPC DATAPAC X.25 PP S/W		F6061
MPC-OM PP INTERFACE TO CC		F6997
MPC-OM GROUP DEFINITIONS		F6999
MPC-OM COLLECTION(CC)		F7051
MPC-OM CC INTERFACE TO PP AND PP DATA REGISTRATION		F7052
MPC-OM PP LINK DATA COLLECTION		F7053

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC - OS
Feature no	F3833

FEATURE SYNOPSIS

The multi-protocol controller is a general-purpose data communications board that interfaces to DMS-100F through an input/output controller (IOC) shelf. The MPC has two communication links and operates at speeds up to 19.2 kbits per second. MPC implements levels 1, 2, and 3 of the BX-25 software layered communication protocol.

FEATURE DESCRIPTION

The purpose of the MPC peripheral is to implement low level data communication functions thereby reducing the amount of time required of the CC for data communications.

The MPC project is composed of the following features:

1. F0501 - MPC Operating System
2. F0502 - MPC Command Interpreter/Link Supervisor
3. F0503 - MPC Input/Output Controller Handler
4. F0504 - MPC Data Link Handler
5. F0505 - MPC ROM Maintenance and CC Loader
6. F0508 - MPC BX.25 Level 2
7. F0509 - MPC Monitor

The MPC is designed to service DMS-100 applications that require data communications. The design allows for flexibility and enhancements by adapting to different applications with minimal changes to existing software. The MPC provides low level protocol support for Engineering Administrative Data Acquisition System (EADAS) data collection.

BX.25 is a layered protocol. Each layer or level specifies the interfaces between peer levels residing in different machines. The MPC implements the first three levels of the BX.25 layered communications standard and a fourth level that handles link states.

Level 1 (physical level) consists of a synchronous data circuit between the MPC and a network node.

Level 2 (link or frame level) handles the direct interface to level 1. Its primary function is to assure reliable transmission of information (frames) across the immediate physical data link. This transportation of information is done by providing frame numbering and a cyclic redundancy check, with procedures for flow control, error detection, and retransmission. In addition to these basic services, an optional password

exchange provides a security check before a link is established over a dial-up circuit.

Level 3 (packet level) controls the routing of information between high-level application programs. Since application information may need to pass through numerous machines or nodes to reach its final destination, level 3 is said to create virtual circuits between applications.

Level 4 (link supervisor) serves as the highest level of control for error handling on the MPC and keeps the status of the links.

The MPC operating system provides utilities for buffer management, asynchronous intertask communication, and timing. Each utility is accessible by procedure call from any application task. Procedures include send and receive messages and start, query, and cancel timers. The NT1X89AA is required in an IOC shelf for this feature.

The MPC operating system consists of these major components:

- . Microkernel and closely related modules
- . Microkernel debugger
- . Application level utilities, including:
 - queues system
 - timer system
 - inter-task communication (ITC) system
 - SWERR system
 - audit task
 - idler and CPU usage monitoring task
 - local terminal I/O and display formatting support

References:

BF0501, F3834, F3835, F3836, F3838, F3839, F3840

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC - COMMAND INTERPRETER
Feature no	F3834

FEATURE SYNOPSIS

The command interpreter/link supervisor (CI/LS) is the highest level of intelligence for the multi-protocol controller (MPC). As such, the CI/LS acts as the interface between the Central Controller (CC) and the BX.25 implementation levels of the MPC. The CI/LS handles the processing of all commands and data, and maintains the status of the communication links.

FEATURE DESCRIPTION

The CI/LS consists of two components: command interpreter and link supervisor. The CI handles the initial processing of all commands and data coming from the CC through the IOC. When the CI receives a command from the IOC, the CI checks the solidity of the command and sends the command down to the communications protocol (BX.25).

The LS maintains the status of the communications links and verifies the applicability of commands based on the link state. The LS routes data received over the communications link up through the IOC handler to the CC.

References:

BF0502, F3833, F3835, F3836, F3838, F3839, F3840

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC - IOC HANDLER
Feature no	F3835

FEATURE SYNOPSIS

The input/output controller (IOC) handler of the multi-protocol controller (MPC) controls and performs physical input and output between the MPC and the IOC for application (i.e., non-ROM maintenance) mode software. This includes input which is sent to the command interpreter (CI) from the CC and output sent to the CC from the CI.

FEATURE DESCRIPTION

The IOC handle transmits data bidirectionally between the MPC and the CI. A message comes through IOC interface and is placed in buffer, after having its IOC header removed. The CI takes the message from the buffer, completes the necessary operation and enqueues an echo to the echo queue. The output handler buffer (OBH) task dequeues the echo, reformats the message by placing IOC header back on, and sends it to the CC.

References:

BF0503, F3833, F3834, F3836, F3838, F3839, F3840

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC - DATA LINK HANDLER
Feature no	F3836

FEATURE SYNOPSIS

The multi-protocol controller (MPC) data link handler is level 1 of the BX.25 layered communications protocol. Level 1 is the lowest level of BX.25 and is implemented in the MPC as part of the communications driver. Level 1 handles the actual hardware interface and controls the physical communication links between the MPC and outside devices.

FEATURE DESCRIPTION

Level 1, the lowest level of the 3-level communications driver, drives the MPC hardware. Level 1 software includes procedures to:

- Configure links
- enable links
- query the status of links
- disable the physical communication links
- transmit data on the links.

Level 1 software also includes interrupt service routines to:

- transmit data
- receive data
- change link states

References:

BF0504, F3833, F3834, F3835, F3838, F3839, F3840

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC - BX.25 LEVEL3
Feature no	F3838

FEATURE SYNOPSIS

The multi-protocol controller (MPC) implements levels 1, 2 and 3 of the BX.25 layered communications protocol. Level 3 (packet layer) is the highest level of BX.25 implemented in the MPC. Level 3, through multiplexing, permits many conversations to use one physical link to send and receive data between machines. Level 3 is also responsible for packet numbering, flow control, error control and reset and restart procedures for the protocol.

FEATURE DESCRIPTION

The level 3 implementation of BX.25 is made of two tasks per link: receive data and transmit data. For the first phase the following types of packets are used:

Data Packet - used to transport a packets worth of data (256 bytes) in the first application.

Flow Control Packet - used to exchange numbering information with the other end.

Reset/Restart Packet - used to resynchronize conversations and the level 3 protocol.

Level 3 software includes procedures to:

- . start level 3 protocol
- . enter level 3 protocol disconnect mode
- . interface with the CI/LS/CS

References:

BF0507, F3833, F3834, F3835, F3836, F3839, F3840

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC - BX.25 LEVEL2
Feature no	F3839

FEATURE SYNOPSIS

The multi-protocol controller (MPC) implements levels 1, 2, and 3 of the BX.25 layered communications protocol. Level 2 is responsible for the reliable transmission of frames over a link, frame numbering, flow control and link access procedure B (LAPB) link layer procedures.

FEATURE DESCRIPTION

Level 2 of the MPC is a state machine used to implement link layer procedures based on the type of frame received and other events such as time outs or commands from the command interpreter/link supervisor, CI/LS. The LAPB, link access procedure B, procedures used in the MPC for this protocol are defined in BX.25. The types of frames used are divided into the three groups listed below:

I frame - information frame - used for the transmission of data.

S frame - supervisory frame - used for flow control and exchanging numbering information with the other end.

U frame - unnumbered control frame - used for link set up and link disconnect.

Level 2 software consists of modules to:

- . start level 2 protocol
- . enter level 2 protocol disconnect mode
- . implement level 2 state tables
- . interface with the higher levels of the protocol.

References:

BF0508, F383, F3834, F3835, F3536, F3838, F3840

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	PROTOCOL SUPPROT BX25
Feature no	F3913

FEATURE SYNOPSIS

Protocol support is an add on to existing MPC CC software. The role of this feature within the MPC world is to provide support in the CC software for the CC to MPC protocol application interface.

FEATURE DESCRIPTION

Protocol support software will ensure that links and conversations are brought up and kept up. Periodic audits will be performed on links and conversations to keep them up and ensure that their states as known by the CC match the actual states on the MPC. If the states are out of step, BX.25 support software will take appropriate action depending on the specific scenario.

The capability will be provided via the MAP display to monitor the status of links and conversations. Maintenance is available on an MPC board level only and not on individual links. This maintenance is accomplished via MPC card commands.

A new table called BX.25 Link and a CI command MPCQLINK is used for this feature. BX.25 link contains parameters for configuring links on an MPC board. In phase I software will support a single application called EADAS.

References:

BC1334

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	TABLES, MAINTENANCE I/O FILE SYSTEM
Feature no	F3914

FEATURE SYNOPSIS

This feature provides CC software necessary to support use of the MPC. This includes the MPC table that identifies MPCs attached to the switch, maintenance software necessary to offline, test, busy, return to service, and download MPCs, a new MAP subdisplay to monitor MPC states, logs for the MPC, input and output routines for communication with MPCs, and file system routines to provide a common I/O interface for applications using MPCs.

FEATURE DESCRIPTION

The MPC combines new Central Controller (CC) software, a new input/output controller (IOC) card (1X89AA), and both firmware and downloadable software for the 1X89AA card. MPC is the MULTI-PROTOCOL CONTROLLER, an intelligent communications controller whose primary functions are to remove responsibility for low-level protocol software from the CC, thus reducing load on the CC, and to diminish the need for a different controller when a new protocol is introduced, since the software loaded into the MPC will implement the new protocols.

This feature provides CC software to support operation of the MPC. It consists of the following:

1. A new table, MPC, is provided to identify MPC boards to the CC. This table has an entry for each MPC, containing the MPC number, IOC number, IOC circuit number, product equipment code (PEC), protocol (e.g., BX.25, DATAPAC, etc.), and the name of the download file for that MPC. Protocol support software (not part of this feature) is responsible for the tables that describe the links on an MPC. For example, if MPC 2 uses the BX25 protocol, then the links on MPC 2 are described in a table that is implemented by the BX25 protocol support software. Applications are responsible for identifying which MPCs, links, and channels they use. The following limits currently apply to MPCs:

- a) Up to 255 MPCs may be used.
- b) There are two 19.2KB "smart" RS232-C links per MPC.
- c) There is one 19.2KB "dumb" RS232-C link per MPC.
- d) There is one RS366 auto-dialler port per MPC.

e) Up to 16 protocols can be supported. Note that this does not mean 16 protocols per MPC. Each MPC supports one protocol. Multiple protocols are supported on multiple MPCs, at least one MPC per protocol.

f) Up to 255 simultaneous "conversations" can be held. This is a total of all conversations on all MPCs on the switch.

2. A new increment has been added to the IOC card display of the MAP. This is similar to that provided for tapes, consoles, etc. Standard IOD/IOC maintenance is supported. A standard CARD display is available at this level for each MPC. A subdisplay, similar to that provided by DISK, is provided to display MPC and link statuses for a single MPC. This is done for 2 reasons:

a) Only 1 IOC port is being used, so firmware does actual routing. We have 4 links on each MPC but the CC sees the MPC as only 1 link. The subdisplay allows us to show the true status for the MPC and its links.

b) Current card displays do not have appropriate titles to display MPC specific states such as MPC OK/link disabled or MPC enabling/link offline and so on.

3. A maintenance audit process periodically polls each MPC to determine whether or not it is functioning properly. This same process also handles maintenance messages and periodically resets fault counters.

4. This feature supports the standard SOS file system for communication with MPCs by applications on the DMS-100. This code has been designed to permit efficient I/O by eliminating the use of separate processes to control individual boards.

5. Standard logs are used with 6 report types. Variable data can appear within each report type to provide more detailed information on the event being logged.

Ref: BC1335

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	APPLICATION SUPPORT
Feature no	F3915

APPLICATION SUPPORT (F3915/BC1336)FEATURE SYNOPSIS

The purpose of this feature is to implement a subset of the CC software for 'phase 1' of the MPC (MULTI-PROTOCOL CONTROLLER) project. In general, the role of this feature within the MPC world is to provide support in the CC software for application CC software requiring the use of a data link on an MPC board.

In 'phase 1' this feature will support a single application called EADAS (Engineering Administration Data Acquisition System)

FEATURE DESCRIPTION

A facility is provided for EADAS to specify a logical channel on a requested data link on an MPC and wait for it to become available for transmission of EADAS data. EADAS only requires the use of Permanent Virtual Circuits (PVC) and not Switched Virtual Circuits (SVC). Hence, 'phase 1' will only support PVCs. PVCs are continuously available virtual paths between remote applications and, in this case, DMS applications thus eliminating the need to establish a circuit on a per call basis as SVCs do.

Protocol support software comprises the bulk of the development being done in this area. The ability for application software to wait on a PVC is provided as a utility procedure in the protocol support software.

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC LOGS FOR IOD MAINTENANCE
Feature no	F5760

FEATURE SYNOPSIS

This feature generates a log for each state transition of the multi-protocol controller (MPC).

FEATURE DESCRIPTION

This feature is an enhancement of NTX273 MPC, which is a general purpose data communications package allowing communications between a DMS-100 and another computer via BX.25 issue 3A protocol.

The states are similar to IOD MTCE:

- unequipped
- offline
- Mem_busy
- System_busy
- OK

A log is generated when MPC goes through a state of transition. The alarm level is no-alarm for any transition into the status unequipped, offline, OK. The alarm level is minor for any transition into man-busy. The alarm level is major for any transition into the state system-busy.

Ref: BC2132

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC DATAPAC X.25 PP S/W
Feature no	F6061

FEATURE SYNOPSIS

This feature enhances the interface (CC and PP) of the multi- protocol controller (MPC) to allow creation and sessation of X.25 switched virtual circuits (SVC) specific to the environment of the datapac public data network (PDN). This enhancement is in addition to the permanent vintual circuit (PVC) capability already available with the MPC.

FEATURE DESCRIPTION

Prior to this enhancement, the MPC supported only PVC's per Bellcore specification of BX25, which represents a subset of general X.25 capabilities. This enhancement was requested for the NOS package in order to replace DPC (DPAC) for communications between DMS and DNC-500.

This feature implements the basic CCITT rec X.25 of 1980, level 1, 2 and 3 by making the MPC a DTE. The 1984 version of X.25 is not implemented. Level 2 implements the LAPB only.

Ref: FDOC AF0015, AF0015

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC-OM PP INTERFACE TO CC
Feature no	F6997

FEATURE SYNOPSIS

This feature supplies the messaging functions necessary to report to the Central Control, Operational Measurements (OMs) that reflect activity on the Multi-Protocol Controller (MPC) peripheral board.

FEATURE DESCRIPTION

The OMs are recorded in the registers of OM groups MPCBASE, MPCLINK2, and MPCLINK3. The accumulated OM counts are sent to the Central Control upon receipt of a query message from the CC.

Ref: FDOC AF1131

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC-OM GROUP DEFINITIONS
Feature no	F6999

FEATURE SYNOPSIS

This feature defines three Operational Measurement (OM) groups to report statistics collected in the Multi-Protocol Controller (MPC) software.

FEATURE DESCRIPTION

The three OM groups are MPCBASE, MPCLINK2, and MPCLINK3. This feature specifies the registers for each of the MPC groups, and controls allocation of the registers.

The OMs defined by this feature cover all of the input/output aspects associated with using the MPC.

The MPCLINK2 and MPCLINK3 groups are composed of registers for data collected at the MPC board level. The registers in MPCLINK2 and MPCLINK3 collect data pertaining to link2 and link3 respectively.

The MPCBASE group is composed of registers that hold data collected with the MPC CC software.

Ref: FDOC AF1127

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC-OM COLLECTION(CC)
Feature no	F7051

FEATURE SYNOPSIS

This feature accumulates Multi-Protocol Controller maintenance and high-level input/output data in the 15 registers of OM group MPCBASE.

FEATURE DESCRIPTION

The 15 registers of OM group MPCBASE are briefly described below:

MPCNSOK - usage when MPC node status is OK
MPCNSSBU - peg of times MPC node status goes system busy (SBSY)
MPCNSMBU - peg of times MPC node status goes man-made busy (MBSY)
RESETL2 - peg of link resets on MPC link 2
RESETL3 - peg of link resets on MPC link 3
CONVERR - peg of resets on established conversations on MPC links 2 and 3
CONVESTB - peg of DMS/remote conversations established
CONVIREF - peg of incoming conversation requests refused at the DMS
LOSTMSGS - peg of incoming data segments that the intended application does not receive
L2UDSIN - peg of incoming user data segments on link 2
L3UDSIN - peg of incoming user data segments on link 3
L2UDSOUT - peg of outgoing user data segments on link 2
L3UDSOUT - peg of outgoing user data segments on link 3
FCTRLDEL - peg of times the board refuses data as a result of buffer overflow
BDAPPERR - peg of peripheral traps

Several of the maintenance and input/output related counts, MPCNSSBU, RESETL2, RESETL3, CONVIREF, CONVERR, LOSTMSGS, and RCTRLDEL are normally zero or very low. If CONVIREF, the number of incoming conversation requests refused at the DMS, is high, it may indicate incorrect datafill in Table X25LINK or application tables. If LOSTMSGS, the number of incoming data segments that the intended application does not receive, is high, it indicates unstable application activity.

High counts in other registers that are normally zero or low indicate protocol or physical inconsistency.

Ref: FDOC AF1128

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC-OM CC INTERFACE TO PP AND PP DATA REGISTRATION
Feature no	F7052

FEATURE SYNOPSIS

This feature allows the Central Control software to transfer Operational Measurement (OM) data from the Multi-Protocol Controller (MPC) Peripheral Processor (PP) to the CC.

FEATURE DESCRIPTION

The OM groups MPCLINK2 and MPCLINK3 collect maintenance and input/ output traffic measurements on one of the two synchronous RS232 data ports of the MPC.

The BDAPPERR register in the MPCBASE group collects measurements of traps in the peripheral software.

This feature allows the CC to receive collected measurements from the peripheral, and to deposit the measurements in the appropriate OM registers.

The data in OM groups MPCLINK2, MPCLINK3, and MPCBASE is collected by the peripheral and periodically transferred from the MPC board to the DMS Central Control.

Ref: FDOC AF1129

Package	NTX273AA07 MULTI - PROTOCOL CONTROLLER BX.25
Feature set	MPC
Feature	MPC-OM PP LINK DATA COLLECTION
Feature no	F7053

FEATURE SYNOPSIS

This feature accumulates Operational Measurements (OMs) that reflect link traffic and link maintenance activity on the Multi-Protocol Controller (MPC) peripheral board (PEC NT1X89AA).

FEATURE DESCRIPTION

The link OMs are divided into three levels: physical, link, and network.

The physical counts in the group are designed to aid diagnosis should the link state never become active, or should an inordinate number of initializations, retransmissions, or errors be recorded.

Counts for the link level reflect both traffic and exception conditions. High counts reflect potential physical problems or may represent protocol incompatibility between the far-end system and the local MPC system on the DMS.

The network level counts transmission of application data and user data.

Ref: FDOC AF1130

NTX277AA02 Status: RTM DIALABLE LINE CIRCUIT IDENTIFICATION

MAINTENANCE AND TESTING	:	
DIALABLE CABLE LOCATOR TONE		F2569
DIALABLE SHORT CIRCUIT		F2570

Package	NTX277AA02 DIALABLE LINE CIRCUIT IDENTIFICATION
Feature set	MAINTENANCE AND TESTING
Feature	DIALABLE CABLE LOCATOR TONE
Feature no	F2569

FEATURE SYNOPSIS

DMS-100, upon receiving a security/access code followed by a seven digit DN from any line circuit, should provide the desired tone across the tip & ring leads of the dialed DN.

FEATURE DESCRIPTION

Upon dialing an access code followed by a seven digit DN from any line circuit, the DMS-100 will connect the desired tone on the tip and ring of the dialed DN. The cable locator tone will remain on the line for the predetermined period of time.

This feature will eliminate manual intervention at the central office. It will provide the capability to automatically connect the tone generator to the desired line.

Example: 6111234 dials acc_code + 6211235

If call is successful:

DN 6211234 gets confirmation tone

DN 6211235 gets cable locator tone for CABLE_TONE_TIMEOUT time.

Telco will have control over the number of digits in the access code. Up to seven digits can be specified for the access code. It is desirable to use at least three digits for the access code.

acc_code = 3 to 7 digits plus nxx-xxxx = regular 7-digit DN

Customer will be able to change acc_code by datafilling the standard pre-translator table (STDPRT).

This feature will exist in optional package NTX277AA.

Reference - FDOC - BR0569

NB: Requires a telco tone generator.

Package	NTX277AA02 DIALABLE LINE CIRCUIT IDENTIFICATION
Feature set	MAINTENANCE AND TESTING
Feature	DIALABLE SHORT CIRCUIT
Feature no	F2570

FEATURE SYNOPSIS

This feature provides the capability of applying a timed short circuit across the tip and ring leads of a DMS-100 line. The length of time that the short circuit is applied is telco defined, typically 2 to 5 minutes.

FEATURE DESCRIPTION

In the process of diagnosing a fault on a line, it is sometimes necessary to place a short across the tip and ring leads of the line. At present, this is done manually requiring human intervention at the test desk or in the central office.

This feature eliminates the need for manual intervention by providing this capability via an access code dialed by a craftsperson from either the faulty line or any other DMS-100 line.

Upon receiving an access code from a line, DMS-100 provides a timed short circuit across the tip and ring leads of that line. If the access code plus a seven digit directory number is dialed, then the DMS-100 provides a timed short across the tip and ring leads of the dialed line. The access code is telco defined and may be three to seven digits long. The short will be applied for a specified time which is also telco defined.

A short circuit call is routed to new type of horizontal on the metallic test access (MTA) minibar switch, which provides a short circuit across tip and ring of a line connected to it.

Ref:

BR0570 FDOC

GS2X46 MTA

GS3X09

NTP 297-2101-516 Line Maintenance Reference Manual

Package	NTX286AA01 M CCS - QUERY VIA OC DATA LINK(ORDER BY MASTER PKG
Feature set	M CCS
Feature	M CCS - QUERY VIA OC DATA LINK
Feature no	F3393

FEATURE SYNOPSIS

M CCS will be supported in a remote OC toll center without that toll center being equipped with CCIS-DS. M CCS messages are passed to the host OC toll center where the messages are transferred to a CCIS-DS data link and forwarded to a centralized data base. The remote OC toll center must be minimally equipped with NTX171AA (M CCS) while the host OC toll center must be equipped with NTX171AA, NTX040AA, and NTX197AA.

FEATURE DESCRIPTION

Since there is a very high cost associated with provisioning a Direct Signalling facility to the CCIS network, the OC configuration can achieve a significant saving by optionally performing all Direct Signalling queries from the host office, thereby removing the requirement for a Direct Signalling facility from each remote office which support M CCS. This feature provides such a facility.

When the remote office requires a Direct Signalling query to the Billing Validation Centre, it sends its request, along with appropriate call details, to the host office via the OC data link and waits for a reply.

The host office recognizes the request, initiates the actual Direct Signalling query to the Billing Validation Centre, and waits for a reply. After a delay of up to two seconds, the host receives the Direct Signalling reply and relays it over the OC data link back to the remote office. The remote office then continues processing the M CCS call according to the results of the query.

Note that in the remote office the time elapsed for the M CCS query is increased by the time taken to send and receive a message over the OC data link.

Package	NTX290AA01 TANDEMING/SUPERVISION AND TREATMENT
Feature set	SWITCHING AND TRANSLATION
Feature	TANDEMING/SUPERVISION AND TREATMENT UPON ATB
Feature no	F2533

FEATURE DESCRIPTION

This feature's purpose is to make possible the sending of a supervision signal from the DMS back to the originating office. Three new CLLIs will be added in table CLLI : OFFHKSUP, WINKSUP and ONHKSUP. They can thus be made a part of a routing list, prior to treatment.

When the routing list leads to one of these signals, OFFHKSUP, WINKSUP or ONHKSUP, it will provide, respectively, an offhook signal, a wink signal or an onhook signal towards the originating trunk. The wink signal will follow the standard DMS timings set in table OFCSTD. Note that, of course, these CLLIs do NOT correspond to a physical circuit. They are similar in nature to the LKOUT clli.

This feature can also be used in cases where telcos are trying to tandem traffic through local offices to a CAMA or TOPS offices.

IMPORTANT NOTES:

- A) This feature will only send these supervisory signals to incoming/originating trunks. If a line or other unsupported originator tries to terminate on this type of supervision clli, they will skip to the next route in the route list, or get the normal ATB treatment right away if the route is exhausted.
- B) This feature will support only certain types of trunks. Please see next page for a complete list. IBN and AUTOVON trunks will NOT be supported, as they already have their own peculiar supervision protocol, which would be disturbed by this feature.
- C) No OMs will be provided for the calls that get this supervision. If the telco wants to find out calls that overflow their original group, they can look into OMs for that trunk group.

OPTIONALITY :

This feature IS optional. It is formed by the new subsystem TKSUPSUB.

TYPES OF TRUNKS SUPPORTED

This feature will ONLY support the following trunk groups :

- 3 SC 3 Incoming and 2way Cama/Supercama trunks, inc side.
- 3 IS 3 Incoming Service Desk.
- 3 IT 3 Toll Trunks, incoming and 2way, inc side.
- 3 OI 3 Operator Incoming trunks (toll, colocated).
- 3 OC 3 2way/outgoing CAMA trunks, incoming side.
- 3 OP 3 TSPS Tandem trunks, 2way, inc. side.
- 3 TI 3 Local Incoming trunks.
- 3 T2 3 Local 2way trunks, inc. side.
- 3 TOPS 3 TOPS Trunks, 2way and incoming.
- 3 A5 3 AMR5 2way trunks, inc. side.
- 3 TDDO 3 Tandem DDO trunks.

NTX291AA04 Status: RTM ENHANCED REAL TIME INDICATOR

ADMINISTRATION	:	
ENHANCED REAL TIME INDICATOR		F1489
NEW CC REAL TIME INDICATOR		F2942
ENHANCED ACTIVITY		F6091

Package	NTX291AA04 ENHANCED REAL TIME INDICATOR
Feature set	ADMINISTRATION
Feature	ENHANCED REAL TIME INDICATOR
Feature no	F1489

FUNCTIONAL DESCRIPTION

1.0 DESCRIPTION OF MEASUREMENTS

This feature involves the development of a system monitoring tool to be called 'Activity'. The description of this tool follows.

1.1 OVERVIEW

This monitoring tool provides information regarding the following:

System Status This is composed of the standard MTC top level display of the MAP.

Traffic These measurements are extracted from operational measurement tables to reflect the amount of traffic being handled by the office.

Occupancy This uses firmware timing to determine the CPU processor occupancy for different classes of system activities.

Grade of Service This set of measurements reflects customer grade of service of the various queues in the system.

These measurements will allow Telco personnel to accurately determine the performance of their DMS switch.

1.2 QUEUES

Measurements will be taken on the priority 6 scheduler queue, the priority 5 scheduler queue (majority is call processing), and the background level scheduler queue (priorities 2, 3 and 4, mostly maintenance). The CCB queues that will be looked at are the CCB originating queue and the CCB progress queue. These are used for new originating calls and those in progress respectively. Note that the CCB progress queue has a slightly higher priority than the CCB originating queue.

In addition to the queues, various operational measurements will be extracted. There are also some other miscellaneous measurements which will be elaborated upon later.

1.3 TIME SAMPLES

The measurements will be taken and displayed over a sampling period of one minute. With this time sampling, the following phenomenon may occur. A

call is originated in this time sample, and completed in another, or a call is completed in this time sample that was originated in a previous one. This skew may cause some percentage measurements to hover below or above 100⁴, and not always be exactly 100⁴. This does not mean that calls are being lost.

2.0 MAN-MACHINE INTERFACE

This monitoring tool will be invoked from the MTC level of the MAP. The tool runs at high priority independent of other processes. The display area of the output is described in the section 'Specific Measurements and Output'. There is also a facility which permits logs to be generated for the measurements. This basically provides a summary of the map display's output. Every 15 minutes, 15 lines of output reflecting the screen display during the last 15 minutes, and one line of summary will be added to the log buffer and the total of 16 lines will be output as a log. The buffer will be large enough to hold 4 hours worth of reports. LOGUTIL must be turned on in order for the log outputs to be available. The subcommands for 'Activity' are enumerated below:

As soon as the Activity map level is entered, the monitoring will be started. Every user to subsequently enter the same map level from other terminals will restart the monitoring for all users. The screen will be updated, and logs will be generated. More details follow with the explanation of each subcommand.

START This subcommand will also cause the monitoring to commence. The screen display will be updated once every minute. From this point, the user can continue watching the display until he/she decides to stop it. If no command is issued to stop, the tool will automatically turn itself off after 4 hours and 15 minutes. When the START subcommand is invoked, the logs for 'Activity' will automatically be started up. The logs will remain running until either the QUIT subcommand is entered, or until the time limit expires. The extra few minutes in the maximum duration is to allow the final log to be output. The timer on the screen will reflect the remaining time of action for 'Activity'. It will also, therefore, reflect the time remaining for the logs.

If START is entered again, the tool continues to execute, but the timer is refreshed. This means that the user can continue for another 4 hours and 15 minutes. Note that if, say, 45 seconds has expired since the last output, the next one will appear in 15 seconds, even though the timer may only register 45 as its seconds portion. At this point, the seconds portion will be zeroed out, and the updates will continue on normally. The time span between each screen update will still be one minute.

When the Activity map level is first entered, it will automatically cause the monitoring to commence. The result will be the same as if START was entered. The use of this START subcommand is to reset the timer to the maximum, or to restart the monitoring if it has timed out.

STRLOG If this subcommand is entered, a parameter of time must also be entered. This allows the logs to be running independent of the map display. The time parameter specifies for how long the logs are to be running. The maximum time allowable is 255 minutes, or less if the internal maximum time is less (this is an office parameter). The user will not be able to enter a duration greater than the value of the office parameter. If no parameter is entered, it will default to the maximum. The user should note that an office parameter value of less than 16 would not allow enough time for the first log to be output (the first 15 minute log will be output in the 16th minute). It is because of this that if the maximum duration in the office parameter table is less than 16, STRLOG may not be entered with no duration parameter. Once the time limit has expired, the log system for 'Activity' will shut itself off. If the subcommand QUIT is subsequently entered, the logs will continue to run.

STOPLOG This subcommand tells the system to stop the execution of the logs for 'Activity'. When this is entered, the logs will stop, and the most recent, uncompleted report will not be recovered.

Only the logs will be stopped at this point. The monitoring will continue, and the screen updates will continue as normal.

QUIT This subcommand will cause the user to exit out of the 'Activity' map display. If the logs for 'Activity' were running, having been automatically invoked by initial Activity entry or by the START subcommand, they will be stopped at this point. If the logs had been invoked by the STRLOG subcommand, then they will continue to run when QUIT is issued.

If a number of people are using the 'Activity' map display and the logs are running, where a STRLOG had been entered, the last person to QUIT out of the display will be prompted to confirm that the logs are to be left running. This guards against the logs being accidentally left on.

2.1 IMPACT ON MAINTENANCE

If a mismatch occurs between the two CC's, this tool will automatically turn itself off and the machine will remain in synchronous operation. Because this tool runs at high priority, it should not be running if this occurs. The message 'Execution of Activity stopped due to mismatch. Please not invoke Activity for 15 minutes' will be output at this time to any map terminal in the Activity subsystem. If the logs for Activity were running at the time, a log will be generated giving the same message to the user. Note that the user will not be able to invoke 'Activity' for 15 minutes. This is to ensure that if another mismatch occurs, complete diagnostics may be run.

The user may enter the Activity subsystem, and attempt to start the monitoring. A message will be output telling the user of the previous mismatch, and the request for commencement of monitoring will be withheld for 15 minutes. After this time, the monitoring will start, and the tool will continue as expected.

2.2 IMPACT ON MAINTENANCE

This tool runs at high priority and will therefore affect service delays, occupancy and high priority queue measurements. The tool itself will be reflected by about 1^4 to 2^4 of the corresponding measurements. The firmware timing used by the tool adds overhead to all activities and is reflected by about 3^4 to 5^4 of the measurements CPOCC and SCHED.

The result is that this tool does somewhat reduce the efficiency of the call processing activity of the switch. It is for this reason that the tool will automatically turn itself off if left unattended.

2.3 EXPONENTIAL DISTRIBUTIONS

The measurements for the queues will be calculated on an exponential scale unless stated otherwise. Each entry on this exponential scale will represent a time range. The width of each entry will double with each consecutive entry for a particular measurement. The widths are based on a normal distribution calculated from the number of ticks that transpire for a particular time range. Each time range represents the time in milliseconds that a process waited on the particular queue.

Package	NTX291AA04 ENHANCED REAL TIME INDICATOR
Feature set	ADMINISTRATION
Feature	NEW CC REAL TIME INDICATOR
Feature no	F2942

FEATURE SYNOPSIS

This feature is the implementation of feature AG0354, ACTIVITY and ANALYSIS evolution specification. The CPSTATUS tool provides a measure of all CPU occupancies including call processing occupancy, a measure of additional CPU time available for call processing work, an indication of overload and an indication of switch performance with respect to the switches engineering. The Network Management MAP level CP indication now uses CPSTATUS data collection when possible.

This tool will be available on NT40 and E-CORE processors.

FEATURE DESCRIPTION

Expected CPU Time Allocation:

The following is a list of major CPU classes and the time they are expected to consume at full load with CPSTATUS running:

- The scheduler - 7⁴
- System7 scheduler class --+
+ - 1⁴
- System6 scheduler class --+
- IO interrupts - 11⁴ ----- These two make up
- High priority CP class +----- call processing
- Call processing class + 6⁸ occupancy.
- Deferrable CP class -----+
- NOS file transfer class - 3⁴ - In non NOS offices this goes to call processing.
- Maintenance class - 2⁴ - This can jump to 8⁴ if needed at the expense of call processing.
- Guaranteed terminal class - 2⁴ - Office parm controlled and can grow to 16⁴ at the expense of call processing.
- Guaranteed OM class +
- + - 3⁴
- OM class +
- Background class +

- + - 3⁴
- Deferrable background class +
- System0 class - 0⁴

Real Time Effect:

The cost of taking the CPSTATUS measurements should be no more than $\frac{1}{3}$ of total CPU at capacity. CPSTATUS usage measurement will have an accuracy of $\pm 3\%$ of the values quoted and will be rounded off to the nearest percent. The error for a given usage value will therefore be within $\pm (0.5 + (0.03 \times \text{usage value})^2)$, i.e., in practice the smallest error will be $\pm 0.5\%$ and the largest error should be $\pm 3\%$. The CPSTATUS data obtained independently from ACTIVITY and ANALYSIS data.

Package	NTX291AA04 ENHANCED REAL TIME INDICATOR
Feature set	ADMINISTRATION
Feature	ENHANCED ACTIVITY
Feature no	F6091

FEATURE SYNOPSIS

The ACTIVITY enhancement feature will provide i) enhancements to ACTIVITY's autoshutoff utility and, ii) extension of log output to reflect all the data available on the screen.

FEATURE DESCRIPTION

The real time indicator tool ACTIVITY enables Telcos to monitor traffic flow, occupancy, grade of service, and above all to confirm that a switch is handling calls properly.

The use of the tool does slightly reduce the efficiency of the call processing activity of the switch. For this reason the tool automatically turns itself off if left unattended. For accurate occupancy monitoring, it is desirable to provide the option of having ACTIVITY always running and have all the data available in the logs.

With this feature the following changes will be made:

AUTOSHUTOFF

a) An extension of the maximum allowable time length from 255 minutes (4 hrs 15 minutes) to 510 minutes (8 hrs 30 minutes).

b) A new parameter for the strtlog command which will allow the tool to run 'forever' until STOPLOG is entered or a restart occurs.

GENERATED LOGS

Currently the data output in the logs is only a subset of the data available on the screen.

Every 15 minutes the data that has been output to the activity map level in the 15 minutes is sent to the log device as defined by LOGUTIL commands. This feature will ensure that all the data available on the screen is contained in the logs.

Ref: FDOC AL0139

NTX292AB03 Status: RTM ENHANCED SECURITY - WITH PASSWORD ENCRYP

SECURITY	:	
ENHANCED COMMAND SCREENING		F3334
PASSWORD CONTROL		F3335
ACCESS CONTROL		F3336
AUDIT TRAIL		F3337
AUTOMATIC LOGOUT OF DIAL-UP LINES		F3339
SECURITY TABLE ENHANCEMENTS		F3854

Package	NTX292AB03 ENHANCED SECURITY - WITH PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	ENHANCED COMMAND SCREENING
Feature no	F3334

FUNCTIONAL DESCRIPTION

Currently, commands may assigned a single command class which is a number from 0 to 15. This feature will allow commands to be assigned any subset of 31 classes. Command screening then becomes a matter of ensuring that a user's command classes has a non-empty intersection with the classes of any command which (s)he wishes to use.

The PRIVCLAS command will be extended to allow setting multiple command classes. There will also be a new table, called CMDS, which will list every command which has at least one command class. This table will be read-only and is intended to complement the query/display functions of the PRIVCLAS command.

Package	NTX292AB03 ENHANCED SECURITY - WITH PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	PASSWORD CONTROL
Feature no	F3335

FUNCTIONAL DESCRIPTION

Password Encoding

Passwords will not be stored in a human readable format. They will be hashed into a difficult to decode form. There will be no provisions for a decoding algorithm anywhere in DMS software. Since passwords will never be displayed, the SHOWPW command will be removed. (Note: Although this feature is optional, password encoding and the removal of the SHOWPW command is not.)

Password Changes

Password changes must be done by supplying the old password. If a password is forgotten it cannot be recalled. However it can be changed by ADMIN to something known. ADMIN may change anyone else's password without specifying the old password.

However ADMIN must normally specify its own password to change it. If a telco forgets its ADMIN password, they should call ETAS who will have a way of changing it. When ETAS is asked to do this, it will be necessary to temporarily take the switch out of service.

Minimum Password Lengths

An officeparm will set the minimum acceptable password length.

Password Ageing

Passwords will be useable for a limited time in order enforce regular password changes. The useable lifespan of passwords will be set by an officeparm. When a user logs on with an expired password, (s)he will be permitted to log on some number of times but will be warned, each time, that the password must be changed. An officeparm will determine the length of this grace period (in number of logons). If a password expires and it is then used enough times to also exhaust the grace period, then it will be forever locked out. ADMIN must then be used to change it.

The exception to this is ADMIN's own password. If ADMIN's password expires then a warning will appear whenever ADMIN logs on. However, ADMIN will

never be locked out, regardless of whether the grace period for ADMIN has expired.

Autolog

Use of Enhanced Password Control will disable all current automatic login features. (See DD sections for details.)

DUMP/RESTORE

Passwords will not be DUMP/RESTORED. At restore time, ADMIN must be used to reset all the other userids.

Package	NTX292AB03 ENHANCED SECURITY - WITH PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	ACCESS CONTROL
Feature no	F3336

FEATURE DESCRIPTION

Summary

This feature is a continuation Enhanced Password Control Feature and implements controlling user access to a DMS-100 in a more general manner mainly by controlling LOGIN access to consoles. Consoles may be selectively enabled (permit logins) or disabled (refuse logins). Consoles may be automatically disabled on login failure. A time limit may be set for logon sequence completion. A time limit which specifies the maximum time a logged in console may be left unused may be set. Various access and security related events will be logged. The login sequence itself will be made more secure.

Details:

1) The LOGINCONTROL command.

This command will be used to control login access to the DMS. It will define which consoles may be used for logins and conditions when they may not be used for logins.

The basic operation is to enable or disable a console. Enable means to accept logins from that console. Disable means to refuse logins. Consoles may be enabled/disabled manually or automatically

Specifically, this command will allow:

- Manual disabling of consoles. An optional timeout may be used to temporarily disable consoles; i.e. after the timeout, the console will be automatically enabled. A logged in console cannot be disabled.
- Manual enabling of consoles.
- Setting criteria for automatic disabling. Specifically:
 - Disable on failure to login correctly. The number of bad login attempts allowed before the console is disabled can be set individually per terminal. This will default to 4. (See note 6.)
 - Disable on failure to login within a maximum time. This timeout will be settable per console. (See note 6.)

- Disable on end of next logon session.
- Disable when forcedout by the system because of idle timeout. (see Controlling automatic logout of idle consoles.)
- Setting the length of time a console is to be disabled if is is disabled automatically. The default is to disable forever.
- Controlling automatic logout of idle consoles. (See section 5.) Idle timeouts may be set individually for each console and selected consoles may be set to never timeout. Consoles which are forced out may also be optionally automatically disabled.

An idle console is one which has been waiting for command input for more than a per-console specifiable timeout. Consoles which are idle for more than their specified idle timeouts will be logged out by the system (forced out).

Query facilities to display the state of each console will also be provided. The enable/disable state of all consoles will be unchanged by a restart.

To prevent the entire system from becoming accidentally inaccessible because all terminals are disabled and no users are logged on, an audit will periodically check that at least one console is enabled at all times. If all terminals are found to be disabled then the system will automatically enable the operator's console and generate a log.

To ensure emergency access to the switch, after a base restart, the operators console will be enabled by the system and will be automatically logged in as OPERATOR.

NOTES

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The concept of enabled or disabled consoles does not affect their use for other than logins. For example it will be possible to print logs on a disabled console with the STARTDEV command or to RECORD onto disabled consoles.

The LOGINCONTROL command will have no effect on consoles used to login to the mate CC with MATEIO.

2) Additional logs.

The following logs will be added:

- Log attempts to login on closed consoles.
- Log disabling of a console: Manual or automatic. If console was manually disabled then the user will be identified. If automatic, reasons for disabling (login failure, login timeout, idle user timeout etc) will be identified.
- Log re-enabling of a console. Manually or by system action.
- Log forcing out of a user because of idle timeout.

These logs will go into the SECURITY log, and therefore the telco may set individual alarm levels against each log. (See feature C1041 for details.)

3) Last Access Notice.

When a user successfully logs on, the console used for the last logon session along with the date and time of the last logon session will be printed.

4) Password suppression.

At login time, the logon password will be obscured. A black-out mask will be overprinted before the password is entered. On VDU terminals, the screen will also clear immediately after the password has been received. Note that the black out mask will be printed even on VDU terminals. This of course does not obscure the entered password on the VDU terminal. It does however obscure the password on any hardcopy device which may be locally slaved to the VDU.

Similarly, when the PERMIT, PASSWORD or UNPERMIT commands prompt for password, the passwords will be obscured.

Since users typing in new passwords may not be able to see what they are typing, the PERMIT and PASSWORD commands will be changed to prompt for the new password twice.

5) Idle Timeout

An idle console is one which is waiting for command input. Consoles which are idle for more than a specified time will be logged out by the system (forced out). (Consoles which are forced out in this manner may also be optionally automatically disabled.)

Two minutes before an idle console is logged out, a warning message will be printed to remind the user to show some activity. It is sufficient to enter any command or just carriage return to indicate that a user is present at the console. The warning will precede the forceout by approximately two minutes.

The maximum time a console may be idle, or the idle timeout, is settable for each console by the LOGINCONTROL command. Also, selected terminals may be designated as never timing out.

It is suggested that terminals in physical proximity to the switch, and specifically the system terminal, be always designated as never timing out. Idle timeouts are more appropriate for remote consoles, particularly dialups.

To ensure emergency access to the switch, after a base restart user OPERATOR will be automatically logged into the operator's console. That console will be automatically set to be immune from idle timeout.

6) Dialups

When a user fails to login (because of too many bad login attempts or because the user took too long) the console may be disabled.

Package	NTX292AB03 ENHANCED SECURITY - WITH PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	AUDIT TRAIL
Feature no	F3337

FEATIRE DESCRIPTION

This feature begins the implementation of an audit trail to track all user security related events on a DMS.

This is:

1) A new log, called SECURITY, and an initial set of reports. There will be reports to record:

- Valid user logins and logouts.
- Invalid login attempts, ex: Wrong or expired password or userid
- Forceout of users.
- Change of password.
- Addition of a userid with the PERMIT command. (The userid created will be identified.)
- Use of the PRIVCLAS command to change commandsets.
- Privilege violation on table access.
- Valid use of selected commands.
- Privilege violation of selected commands.

There will be space allocated to keep 1000 reports in SECURITY.

These reports will be secure; that is, seeing them and manipulating them will be restricted. Also the telco will be able to specify alarm levels to flag these reports. (The SECURITY log will be a SECRET log. See item 2 below.) Alarms will be specified in two ways:

- For reports of the valid or invalid use of commands, the telco will be able to specify whether a report and alarm is to be generated for each command separately. This will be done with extensions to the PRIVCLAS command (see 3).
- For all of the other reports listed above, the telco will be able to optionally specify an alarm level for each report separately. This will be done with extensions to the Log system (see 2).

2) Extensions to the Log system to provide a generalized way of implementing the SECURITY log required by this feature. A new type of log, called a SECRET log, will be created. SECURITY will be a SECRET log. All SECRET logs will have the properties:

- Will not print on any log device.
- Will not be readable with the OPEN command.
- Will only be visible by means of a separate OPENSECRET command which can be privileged.
- Cannot be THRESHOLDed or SUPPRESSED.
- Cannot be CLEARED.
- Each report of a SECRET log can be routed to SYSLOG. But once reports of a SECRET log are in SYSLOG, they are only visible to users who have used the OPENSECRET command on SYSLOG. (See also note 1 below.)
- Can be individually alarmed. For each separate report in a SECRET log, the telco may optionally specify an alarm to be raised when the report is generated. A new table, AUDALARM, will implement this.
- Changes to telco settings of SECRET log alarms will take effect without need for a restart.
- SECRET alarms are not printed by log devices and yet may raise alarms. To aid the telco in rapidly determining the cause of alarms, anytime a SECRET report causes an alarm, a non-secret log will be generated by the alarm system to indicate that an alarmed secret log has occurred. This non-secret log will be printed by the log devices and will not indicate the contents of the secret report, only that an alarmed secret report has occurred.

In addition, a facility for looking at active SYSLOGs will be provided.

3) Extensions to table CMDS. (See also note 5.)

- It will be possible to specify for each command known to CMDS whether a log is to be generated when that command is used validly. And if a log is to be generated, what alarm level if any is to be raised. (See also note 4.)
- Similarly, it will be possible to specify whether a log is to be generated when the command is used invalidly (i.e. a command privilege violation) and if so what alarm level is to be raised.

- Make command class changes and alarm level changes made with the CMDS table take effect without the need for a restart. Also make command class changes or dumpsafe changes made with the PRIVCLAS command take effect without a restart.

NOTES

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1) Sending SECRET reports to SYSLOG.

If SECRET reports are sent to SYSLOG, the copy of the report in SYSLOG cannot be cleared with the CLEAR command. SYSLOG itself will become immune to the CLEAR command.

2) Why are all the bells ringing?

Even though the secret report will not be printed, the alarm system will generate a non-secret report to indicate that an alarmed secret report has been generated.

Because SECRET logs do not automatically print and because they may raise alarms the telco should be aware that the SECURITY log should always be checked when alarms occur for no apparent reason. The alarm system will automatically print an EXT report to remind the telco to look in the SECRET logs. An EXT108 will be printed for critical alarms, an EXT107 for major alarms, and an EXT106 for minor alarms. EXT reports are not generated for no_alarms.

3) OPENSECRET

Note that the security of OPENSECRET and therefore the public visibility of the SECURITY log depends upon the telco having set an appropriate command class for the OPENSECRET command.

4) Inappropriate log report or alarm generation.

Note that it is not feasible with the current command interpreter implementation to determine if a command which has been executed has done anything. If CMDS is set to log a report or generate an alarm upon the use of a particular command, we will generate a log report or alarm upon use of that command independent of whether the command actually did anything significant.

For example, aborting during the parameter prompting phase of a command marked for log report generation upon use will not avoid the generation of a log report.

Similarly, entering 'HELP <commandname>' or 'Q <commandname>' in order to print out the syntax of a command will cause the generation of a log report or alarm if that command has been so set in table CMDS.

5) CMDS and PRIVCLAS

The new fields controlling report and alarm generation on command use and abuse will be visible and changeable only from the CMDS table. PRIVCLAS will continue to be useable for changing command classes and the dumpsafe state. CMDS will now be user writeable. Note that in future BCSs the PRIVCLAS command will eventually be superceded by the CMDS table.

Package	NTX292AB03 ENHANCED SECURITY - WITH PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	AUTOMATIC LOGOUT OF DIAL-UP LINES
Feature no	F3339

FEATURE SYNOPSIS

Terminal users are automatically logged out, and the connection is dropped when a "facility open" condition is detected. Optionally, the terminal may be disabled.

FEATURE DESCRIPTION

Two facility open conditions may be detected, and are indicated by the terminal going busy or disconnect. A terminal is busied either manually or by the system. Loss of carrier causes the terminal to disconnect. This state may be caused by hanging up, by the physical removal of the carrier wire, or by a line failure.

Log report affected is SECU118. A log is generated for a line open condition or an idle user condition. An alarm may be set.

MMI/CI command affected is LOGINCONTROL. This command controls login access to DMS. It controls whether or not logins are accepted from terminals and when they will be closed from logging in. It also controls what conditions will cause the system to automatically logout users.

COMMAND NAME - LOGINCONTROL

SYNTAX:

LOGINCONTROL

```

parm1: <Console>
        console_name
        ALL
parm2: <Action>
        QUERY <brief_full>
                FULL; the default
                BRIEF
        ENABLE
        DISABLE <disabletime>          ; default is FOREVER
                FOREVER
                <time in minutes>
        AUTODISABLETIME <disabletime>
                FOREVER
                <time in minutes>
        MAXLOGINTIME <logintime>       ; default is 60 secs.
                FOREVER

```

```

                <time in seconds>
MAXIDLETIME   <idletime>      ; default is forever
                FOREVER
                <time in minutes>
LOGINRETRIES <numretries>    ; default is 4
OPENCONDITIONFORCEOUT <bool>
DISABLEON    <Add/Set/Remove>
                (ADD, SET, REMOVE)
                <disableonset>
                (LOGINFAIL, LOGINTIMEOUT, IDLETIMEOUT

```

LOGOUT, OPENCOND)

PARAMETERS

OPENCONDITIONFORCEOUT

Indicates that the user at the reported terminal should be logged out when a line open condition is detected. The terminal may optionally be disabled. (See the DISABLEON parameter.)

DISABLEON

Determines what events cause a terminal to be automatically disabled.

The DISABLEON parameter takes two sub-parameters. The first is either ADD, SET, or REMOVE which specifies what to do with the second sub-parameter which is any number of entries from the list: (LOGINFAIL, LOGINTIMEOUT, IDLETIMEOUT, LOGOUT, OPENCOND).

OPENCOND means that the terminal is to be disabled if the user is logged out due to the detection of a line open condition.

Package	NTX292AB03 ENHANCED SECURITY - WITH PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	SECURITY TABLE ENHANCEMENTS
Feature no	F3854

FEATURE SYNOPSIS

Prior to the introduction of this feature the access to the customer data tables was controlled by the privilege class assigned to the table. The user who attempted to access a table had his privilege class matched against the privilege class of the table. If the two matched, access to the table was granted.

This feature goes one step further by allowing the Telco to monitor who is accessing which tables by recording all completed or aborted attempts in a form of a log report.

This feature is optional and can be activated or deactivated on a per table basis by authorized telco personnel.

FEATURE DESCRIPTION

This feature allows the telco to monitor who is accessing which tables. Successful and aborted accesses are recorded in the form of logs for later examination by authorized personnel.

Two new office parameters have been added. The first parameter is a BOOLEAN set by NT. It indicates whether the feature has been purchased or not. This is MONITOR_TABLE_ACCESS parameter in table OFCOPT. The second parameter TABLE_ACCESS_CONTROL in table OFCVAR indicates whether the feature has been activated by telco or not.

The table CUSTPROT is the only table changed. Its tuple has been increased by two new fields: VALACC and DENACC. Each tuple in CUSTPROT table references one of the customer data tables. The new field VALACC (Valid Access) will be set by telco with one of the three values:

OFF - do not generate any logs

WRITE - generate logs only if the table is being written to

ALL - generate logs whenever the table is accessed.

The new field DENACC (Denied Access) will be set by telco with one of the three values as for table VALACC above.

Four new logs of SECRET type have been added:

Log TABL100 is created when an authorized user accesses a table for read and display.

Log TABL101 is created when an authorized user access a table and writes to a tuple.

Log TABLE102 is created when an unauthorized user attempts to access a table.

Log TABL103 is created when an unauthorized user attempts to write to a tuple of a table.

All these logs identify users, terminals and tables, and are generated when tables are accessed using TABLE EDITOR but not when tables are accessed using service order procedures or DMO procedures.

This feature requires feature F3337 as a prerequisite.

References

FDOC BC1305

NTX292BA02 Status: RTM ENHANCED SECURITY - WITHOUT PASSWORD ENC

SECURITY	:	
ENHANCED COMMAND SCREENING		F3334
PASSWORD CONTROL		F3335
ACCESS CONTROL		F3336
AUDIT TRAIL		F3337
AUTOMATIC LOGOUT OF DIAL-UP LINES		F3339
SECURITY TABLE ENHANCEMENTS		F3854

Package	NTX292BA02 ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	ENHANCED COMMAND SCREENING
Feature no	F3334

FUNCTIONAL DESCRIPTION

Currently, commands may assigned a single command class which is a number from 0 to 15. This feature will allow commands to be assigned any subset of 31 classes. Command screening then becomes a matter of ensuring that a user's command classes has a non-empty intersection with the classes of any command which (s)he wishes to use.

The PRIVCLAS command will be extended to allow setting multiple command classes. There will also be a new table, called CMDS, which will list every command which has at least one command class. This table will be read-only and is intended to complement the query/display functions of the PRIVCLAS command.

Package	NTX292BA02 ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	PASSWORD CONTROL
Feature no	F3335

FUNCTIONAL DESCRIPTION

Password Encoding

Passwords will not be stored in a human readable format. They will be hashed into a difficult to decode form. There will be no provisions for a decoding algorithm anywhere in DMS software. Since passwords will never be displayed, the SHOWPW command will be removed. (Note: Although this feature is optional, password encoding and the removal of the SHOWPW command is not.)

Password Changes

Password changes must be done by supplying the old password. If a password is forgotten it cannot be recalled. However it can be changed by ADMIN to something known. ADMIN may change anyone else's password without specifying the old password.

However ADMIN must normally specify its own password to change it. If a telco forgets its ADMIN password, they should call ETAS who will have a way of changing it. When ETAS is asked to do this, it will be necessary to temporarily take the switch out of service.

Minimum Password Lengths

An officeparm will set the minimum acceptable password length.

Password Ageing

Passwords will be useable for a limited time in order enforce regular password changes. The useable lifespan of passwords will be set by an officeparm. When a user logs on with an expired password, (s)he will be permitted to log on some number of times but will be warned, each time, that the password must be changed. An officeparm will determine the length of this grace period (in number of logons). If a password expires and it is then used enough times to also exhaust the grace period, then it will be forever locked out. ADMIN must then be used to change it.

The exception to this is ADMIN's own password. If ADMIN's password expires then a warning will appear whenever ADMIN logs on. However, ADMIN will

never be locked out, regardless of whether the grace period for ADMIN has expired.

Autolog

Use of Enhanced Password Control will disable all current automatic login features. (See DD sections for details.)

DUMP/RESTORE

Passwords will not be DUMP/RESTORED. At restore time, ADMIN must be used to reset all the other userids.

Package	NTX292BA02 ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	ACCESS CONTROL
Feature no	F3336

FEATURE DESCRIPTION

Summary

This feature is a continuation Enhanced Password Control Feature and implements controlling user access to a DMS-100 in a more general manner mainly by controlling LOGIN access to consoles. Consoles may be selectively enabled (permit logins) or disabled (refuse logins). Consoles may be automatically disabled on login failure. A time limit may be set for logon sequence completion. A time limit which specifies the maximum time a logged in console may be left unused may be set. Various access and security related events will be logged. The login sequence itself will be made more secure.

Details:

1) The LOGINCONTROL command.

This command will be used to control login access to the DMS. It will define which consoles may be used for logins and conditions when they may not be used for logins.

The basic operation is to enable or disable a console. Enable means to accept logins from that console. Disable means to refuse logins. Consoles may be enabled/disabled manually or automatically

Specifically, this command will allow:

- Manual disabling of consoles. An optional timeout may be used to temporarily disable consoles; i.e. after the timeout, the console will be automatically enabled. A logged in console cannot be disabled.
- Manual enabling of consoles.
- Setting criteria for automatic disabling. Specifically:
 - Disable on failure to login correctly. The number of bad login attempts allowed before the console is disabled can be set individually per terminal. This will default to 4. (See note 6.)
 - Disable on failure to login within a maximum time. This timeout will be settable per console. (See note 6.)

- Disable on end of next logon session.
- Disable when forced out by the system because of idle timeout. (see Controlling automatic logout of idle consoles.)
- Setting the length of time a console is to be disabled if it is disabled automatically. The default is to disable forever.
- Controlling automatic logout of idle consoles. (See section 5.) Idle timeouts may be set individually for each console and selected consoles may be set to never timeout. Consoles which are forced out may also be optionally automatically disabled.

An idle console is one which has been waiting for command input for more than a per-console specifiable timeout. Consoles which are idle for more than their specified idle timeouts will be logged out by the system (forced out).

Query facilities to display the state of each console will also be provided. The enable/disable state of all consoles will be unchanged by a restart.

To prevent the entire system from becoming accidentally inaccessible because all terminals are disabled and no users are logged on, an audit will periodically check that at least one console is enabled at all times. If all terminals are found to be disabled then the system will automatically enable the operator's console and generate a log.

To ensure emergency access to the switch, after a base restart, the operators console will be enabled by the system and will be automatically logged in as OPERATOR.

NOTES

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The concept of enabled or disabled consoles does not affect their use for other than logins. For example it will be possible to print logs on a disabled console with the STARTDEV command or to RECORD onto disabled consoles.

The LOGINCONTROL command will have no effect on consoles used to login to the mate CC with MATEIO.

2) Additional logs.

The following logs will be added:

- Log attempts to login on closed consoles.
- Log disabling of a console: Manual or automatic. If console was manually disabled then the user will be identified. If automatic, reasons for disabling (login failure, login timeout, idle user timeout etc) will be identified.
- Log re-enabling of a console. Manually or by system action.
- Log forcing out of a user because of idle timeout.

These logs will go into the SECURITY log, and therefore the telco may set individual alarm levels against each log. (See feature C1041 for details.)

3) Last Access Notice.

When a user successfully logs on, the console used for the last logon session along with the date and time of the last logon session will be printed.

4) Password suppression.

At login time, the logon password will be obscured. A black-out mask will be overprinted before the password is entered. On VDU terminals, the screen will also clear immediately after the password has been received. Note that the black out mask will be printed even on VDU terminals. This of course does not obscure the entered password on the VDU terminal. It does however obscure the password on any hardcopy device which may be locally slaved to the VDU.

Similarly, when the PERMIT, PASSWORD or UNPERMIT commands prompt for password, the passwords will be obscured.

Since users typing in new passwords may not be able to see what they are typing, the PERMIT and PASSWORD commands will be changed to prompt for the new password twice.

5) Idle Timeout

An idle console is one which is waiting for command input. Consoles which are idle for more than a specified time will be logged out by the system (forced out). (Consoles which are forced out in this manner may also be optionally automatically disabled.)

Two minutes before an idle console is logged out, a warning message will be printed to remind the user to show some activity. It is sufficient to enter any command or just carriage return to indicate that a user is present at the console. The warning will precede the forceout by approximately two minutes.

The maximum time a console may be idle, or the idle timeout, is settable for each console by the LOGINCONTROL command. Also, selected terminals may be designated as never timing out.

It is suggested that terminals in physical proximity to the switch, and specifically the system terminal, be always designated as never timing out. Idle timeouts are more appropriate for remote consoles, particularly dialups.

To ensure emergency access to the switch, after a base restart user OPERATOR will be automatically logged into the operator's console. That console will be automatically set to be immune from idle timeout.

6) Dialups

When a user fails to login (because of too many bad login attempts or because the user took too long) the console may be disabled.

Package	NTX292BA02 ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	AUDIT TRAIL
Feature no	F3337

FEATIRE DESCRIPTION

This feature begins the implementation of an audit trail to track all user security related events on a DMS.

This is:

1) A new log, called SECURITY, and an initial set of reports. There will be reports to record:

- Valid user logins and logouts.
- Invalid login attempts, ex: Wrong or expired password or userid
- Forceout of users.
- Change of password.
- Addition of a userid with the PERMIT command. (The userid created will be identified.)
- Use of the PRIVCLAS command to change commandsets.
- Privilege violation on table access.
- Valid use of selected commands.
- Privilege violation of selected commands.

There will be space allocated to keep 1000 reports in SECURITY.

These reports will be secure; that is, seeing them and manipulating them will be restricted. Also the telco will be able to specify alarm levels to flag these reports. (The SECURITY log will be a SECRET log. See item 2 below.) Alarms will be specified in two ways:

- For reports of the valid or invalid use of commands, the telco will be able to specify whether a report and alarm is to be generated for each command separately. This will be done with extensions to the PRIVCLAS command (see 3).
- For all of the other reports listed above, the telco will be able to optionally specify an alarm level for each report separately. This will be done with extensions to the Log system (see 2).

2) Extensions to the Log system to provide a generalized way of implementing the SECURITY log required by this feature. A new type of log, called a SECRET log, will be created. SECURITY will be a SECRET log. All SECRET logs will have the properties:

- Will not print on any log device.
- Will not be readable with the OPEN command.
- Will only be visible by means of a separate OPENSECRET command which can be privileged.
- Cannot be THRESHOLDed or SUPPRESSED.
- Cannot be CLEARED.
- Each report of a SECRET log can be routed to SYSLOG. But once reports of a SECRET log are in SYSLOG, they are only visible to users who have used the OPENSECRET command on SYSLOG. (See also note 1 below.)
- Can be individually alarmed. For each separate report in a SECRET log, the telco may optionally specify an alarm to be raised when the report is generated. A new table, AUDALARM, will implement this.
- Changes to telco settings of SECRET log alarms will take effect without need for a restart.
- SECRET alarms are not printed by log devices and yet may raise alarms. To aid the telco in rapidly determining the cause of alarms, anytime a SECRET report causes an alarm, a non-secret log will be generated by the alarm system to indicate that an alarmed secret log has occurred. This non-secret log will be printed by the log devices and will not indicate the contents of the secret report, only that an alarmed secret report has occurred.

In addition, a facility for looking at active SYSLOGs will be provided.

3) Extensions to table CMDS. (See also note 5.)

- It will be possible to specify for each command known to CMDS whether a log is to be generated when that command is used validly. And if a log is to be generated, what alarm level if any is to be raised. (See also note 4.)
- Similarly, it will be possible to specify whether a log is to be generated when the command is used invalidly (i.e. a command privilege violation) and if so what alarm level is to be raised.

- Make command class changes and alarm level changes made with the CMDS table take effect without the need for a restart. Also make command class changes or dumpsafe changes made with the PRIVCLAS command take effect without a restart.

NOTES

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1) Sending SECRET reports to SYSLOG.

If SECRET reports are sent to SYSLOG, the copy of the report in SYSLOG cannot be cleared with the CLEAR command. SYSLOG itself will become immune to the CLEAR command.

2) Why are all the bells ringing?

Even though the secret report will not be printed, the alarm system will generate a non-secret report to indicate that an alarmed secret report has been generated.

Because SECRET logs do not automatically print and because they may raise alarms the telco should be aware that the SECURITY log should always be checked when alarms occur for no apparent reason. The alarm system will automatically print an EXT report to remind the telco to look in the SECRET logs. An EXT108 will be printed for critical alarms, an EXT107 for major alarms, and an EXT106 for minor alarms. EXT reports are not generated for no_alarms.

3) OPENSECRET

Note that the security of OPENSECRET and therefore the public visibility of the SECURITY log depends upon the telco having set an appropriate command class for the OPENSECRET command.

4) Inappropriate log report or alarm generation.

Note that it is not feasible with the current command interpreter implementation to determine if a command which has been executed has done anything. If CMDS is set to log a report or generate an alarm upon the use of a particular command, we will generate a log report or alarm upon use of that command independent of whether the command actually did anything significant.

For example, aborting during the parameter prompting phase of a command marked for log report generation upon use will not avoid the generation of a log report.

Similarly, entering 'HELP <commandname>' or 'Q <commandname>' in order to print out the syntax of a command will cause the generation of a log report or alarm if that command has been so set in table CMDS.

5) CMDS and PRIVCLAS

The new fields controlling report and alarm generation on command use and abuse will be visible and changeable only from the CMDS table. PRIVCLAS will continue to be useable for changing command classes and the dumpsafe state. CMDS will now be user writeable. Note that in future BCSs the PRIVCLAS command will eventually be superceded by the CMDS table.

Package	NTX292BA02 ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	AUTOMATIC LOGOUT OF DIAL-UP LINES
Feature no	F3339

FEATURE SYNOPSIS

Terminal users are automatically logged out, and the connection is dropped when a "facility open" condition is detected. Optionally, the terminal may be disabled.

FEATURE DESCRIPTION

Two facility open conditions may be detected, and are indicated by the terminal going busy or disconnect. A terminal is busied either manually or by the system. Loss of carrier causes the terminal to disconnect. This state may be caused by hanging up, by the physical removal of the carrier wire, or by a line failure.

Log report affected is SECU118. A log is generated for a line open condition or an idle user condition. An alarm may be set.

MMI/CI command affected is LOGINCONTROL. This command controls login access to DMS. It controls whether or not logins are accepted from terminals and when they will be closed from logging in. It also controls what conditions will cause the system to automatically logout users.

COMMAND NAME - LOGINCONTROL

SYNTAX:

LOGINCONTROL

```

parm1: <Console>
        console_name
        ALL
parm2: <Action>
        QUERY <brief_full>
                FULL; the default
                BRIEF
        ENABLE
        DISABLE <disabletime>          ; default is FOREVER
                FOREVER
                <time in minutes>
        AUTODISABLETIME <disabletime>
                FOREVER
                <time in minutes>
        MAXLOGINTIME <logintime>      ; default is 60 secs.
                FOREVER

```

```

                <time in seconds>
MAXIDLETIME   <idletime>      ; default is forever
                FOREVER
                <time in minutes>
LOGINRETRIES  <numretries>    ; default is 4
OPENCONDITIONFORCEOUT <bool>
DISABLEON     <Add/Set/Remove>
                (ADD, SET, REMOVE)
                <disableonset>
                (LOGINFAIL, LOGINTIMEOUT, IDLETIMEOUT

```

LOGOUT, OPENCOND)

PARAMETERS

OPENCONDITIONFORCEOUT

Indicates that the user at the reported terminal should be logged out when a line open condition is detected. The terminal may optionally be disabled. (See the DISABLEON parameter.)

DISABLEON

Determines what events cause a terminal to be automatically disabled.

The DISABLEON parameter takes two sub-parameters. The first is either ADD, SET, or REMOVE which specifies what to do with the second sub-parameter which is any number of entries from the list: (LOGINFAIL, LOGINTIMEOUT, IDLETIMEOUT, LOGOUT, OPENCOND).

OPENCOND means that the terminal is to be disabled if the user is logged out due to the detection of a line open condition.

Package	NTX292BA02 ENHANCED SECURITY - WITHOUT PASSWORD ENCRYPTION
Feature set	SECURITY
Feature	SECURITY TABLE ENHANCEMENTS
Feature no	F3854

FEATURE SYNOPSIS

Prior to the introduction of this feature the access to the customer data tables was controlled by the privilege class assigned to the table. The user who attempted to access a table had his privilege class matched against the privilege class of the table. If the two matched, access to the table was granted.

This feature goes one step further by allowing the Telco to monitor who is accessing which tables by recording all completed or aborted attempts in a form of a log report.

This feature is optional and can be activated or deactivated on a per table basis by authorized telco personnel.

FEATURE DESCRIPTION

This feature allows the telco to monitor who is accessing which tables. Successful and aborted accesses are recorded in the form of logs for later examination by authorized personnel.

Two new office parameters have been added. The first parameter is a BOOLEAN set by NT. It indicates whether the feature has been purchased or not. This is MONITOR_TABLE_ACCESS parameter in table OFCOPT. The second parameter TABLE_ACCESS_CONTROL in table OFCVAR indicates whether the feature has been activated by telco or not.

The table CUSTPROT is the only table changed. Its tuple has been increased by two new fields: VALACC and DENACC. Each tuple in CUSTPROT table references one of the customer data tables. The new field VALACC (Valid Access) will be set by telco with one of the three values:

OFF - do not generate any logs

WRITE - generate logs only if the table is being written to

ALL - generate logs whenever the table is accessed.

The new field DENACC (Denied Access) will be set by telco with one of the three values as for table VALACC above.

Four new logs of SECRET type have been added:

Log TABL100 is created when an authorized user accesses a table for read and display.

Log TABL101 is created when an authorized user access a table and writes to a tuple.

Log TABLE102 is created when an unauthorized user attempts to access a table.

Log TABL103 is created when an unauthorized user attempts to write to a tuple of a table.

All these logs identify users, terminals and tables, and are generated when tables are accessed using TABLE EDITOR but not when tables are accessed using service order procedures or DMO procedures.

This feature requires feature F3337 as a prerequisite.

References

FDOC BC1305

NTX293AA02 Status: RTM ENHANCED SECURITY PACKAGE II

SECURITY	:	
AUTOMATIC DIAL BACK		F3338
DIAL BACK ON OTHER MODEMS		F3896

Package	NTX293AA02 ENHANCED SECURITY PACKAGE II
Feature set	SECURITY
Feature	AUTOMATIC DIAL BACK
Feature no	F3338

FEATURE SYNOPSIS

This feature enhances the security of remote access to DMS using dial up ports by optionally requiring dial back via a companion CTS212AH Smart Modem.

FEATURE DESCRIPTION

The current method of dialing into a DMS from a remote site consists of several basic steps: 1) place the call, 2) receive an answer tone, 3) send an originate tone (press data button), 4) initiate login by entering (break) login, and 5) supply the required user id and password. Once the id and password are verified, the remote user is allowed access to the system. If the id and/or password are incorrect, access is not allowed. The knowledge of a user id-password pair would thus allow anybody to gain access to a DMS switch. This feature eliminates this possibility by providing for a second level of security.

After a remote user logs in, the system disconnects the modem. It then calls the user back and he is required to log in again. Only after this second login is the user allowed access to the DMS. A person knowing some DIALBACK id and password would not be able to access the system unless he also knew the number which the system would call. He would not only have to log in properly from a remote site but from the correct remote site.

The Enhanced Password Control feature (which is included in software packages NTX292AB, Enhanced Security - With Password Encryption, and NTX292BA, Enhanced Security - Without Password Encryption.) is required for dialback to function properly (F3336).

References

FDOC BC1043

Package	NTX293AA02	ENHANCED SECURITY PACKAGE II
Feature set	SECURITY	
Feature	DIAL BACK ON OTHER MODEMS	
Feature no	F3896	

FEATURE SYNOPSIS

This feature enhances the security of remote access to DMS using dial up ports by optionally requiring dial back via a Rixon RZIZA intelligent modem.

FEATURE DESCRIPTION

The current method of dialing into a DMS from a remote site consists of several basic steps:

- 1) Place the call,
- 2) Receive an answer tone,
- 3) Send an originate tone (press data button),
- 4) Initiate login by entering (break) login, and
- 5) Supply the required user ID and password.

Once the ID and password are verified, the remote user is allowed access to the system. If the ID and/or password are incorrect, access is not allowed. The knowledge of a user ID-password pair would thus allow anybody to gain access to a DMS switch. This feature eliminates this possibility by providing for a second level of security.

After a remote user logs in, the system disconnects the modem. It then calls the user back and he is required to log in again. Only after this second login is the user allowed access to the DMS. A person knowing some dialback ID and password would not be able to access the system unless he also knew the number which the system would call. He would not only have to log in properly from a remote site, but from the correct remote site.

The enhanced password control feature (which is included in software packages NTXZ92AB, Enhanced Security - With Password Encryption, and NTXZ92BA, Enhanced Security - Without Password Encryption).

Ref:

FDOC BC1451

Package	NTX297AA01 BRIDGES SERVICES
Feature set	SERVICES
Feature	MULTI_PARTY BRIDGING
Feature no	F6170

FEATURE SYNOPSIS

This feature provides the ability by datafill to associate up to four subscribers with different line equipment into a multi-party group. These subscribers will be given a service equivalent to 2FR or 4FR class.

FEATURE DESCRIPTION

F6170 establishes a new POTS line feature "MULTI-PARTY BRIDGE" (MPB). This line feature associates together a group of up to four subscriber lines so that the lines appear to the subscribers to be different parties of a multi-party line. Such a group of lines is called a MPB group. Each member of a MPB group has a unique directory number and a unique line equipment number. This line feature is compatible only with line class codes 1FR and 1MR and is available for lines connected to any peripheral (eg, LM, LCM, RCU, RCS, RCT).

This feature makes it possible to bridge (by S/W) up to four lines, which cannot be bridged physically (by jumpers) because they have no analog appearance in central office (eg, lines connected to integrated digital loop carrier). This feature is incompatible with the four custom calling features.

Ref: DDOC AF0178

NTX299AA02 Status: A+M SPECIAL SERVICES - SCM(UPG BY NTX299AB)

MAINTENANCE AND TESTING	:	
SMS - MAINTENANCE AND TABLE CONTROL FOR NAILED-UP SPECIAL		F3982
SWITCHING	:	
SCM - SMS SPECIAL SERVICES		F5509
DID PBX VIA HAIRPIN		F6404
DDS HAIRPIN		F6405

Package	NTX299AA02 SPECIAL SERVICES - SCM(UPG BY NTX299AB)
Feature set	MAINTENANCE AND TESTING
Feature	SMS - MAINTENANCE AND TABLE CONTROL FOR NAILED-UP
Feature no	F3982

FEATURE SYNOPSIS

Pairs of SMS (subscriber module SLC-96) p-side channels can be permanently connected through the SMS on a nailed up basis under table control. Each channel is associated either with a special services line terminated on an interfacing RCS or a channel on another DS-1 facility.

FEATURE DESCRIPTION

Pairs of channels associated with DS-1 facilities terminating on the p-side of the same SMS can be connected (nailed up) in accordance with customer assigned data in table PSNAILUP. Each channel is identified either as a channel on an terminated DS-1 facility which does not connect to another remote of this switch or as a special services line terminated on a RSC interfaced to the SMS.

Connections are established within the SMS and do not involve the network. Connections are transparent to the A/B bit signalling appearing on the channel. Signalling is neither scanned for or inserted in the channel.

This feature supports all three RCS modes of operation however with mode II operation special services lines are restricted to the four rightmost channel unit slots.

BC1374, BC1409, BF0519

Package	NTX299AA02 SPECIAL SERVICES - SCM(UPG BY NTX299AB)
Feature set	SWITCHING
Feature	SCM - SMS SPECIAL SERVICES
Feature no	F5509

FEATURE SYNOPSIS

Pairs of SMS (subscriber module SLC-96) p-side channels can be permanently connected through the SMS on a nailed up basis under table control. Each channel is associated either with a special services line terminated on an interfacing RCS or a channel on another DS-1 facility.

FEATURE DESCRIPTION

Pairs of channels associated with DS-1 facilities terminating on the p-side of the same SMS can be connected (nailed up) in accordance with customer assigned data in table PSNAILUP. Each channel is identified either as a channel on an terminated DS-1 facility which does not connect to another remote of this switch or as a special services line terminated on a RSC interfaced to the SMS.

Connections are established within the SMS and do not involve the network. Connections are transparent to the A/B bit signalling appearing on the channel. Signalling is neither scanned for or inserted in the channel.

FDOC BF0519

Package	NTX299AA02 SPECIAL SERVICES - SCM(UPG BY NTX299AB)
Feature set	SWITCHING
Feature	DID PBX VIA HAIRPIN
Feature no	F6404

FEATURE SYNOPSIS AND DESCRIPTION

When the RCS supports DID PBX circuits the Telco will set up an SMS hair-pin connection and loop back to a DTC that supports PX trunks. This feature utilizes existing software. However, test and V.O. will be carried out to verify its functionality.

Ref: DDOC AF0230

Package	NTX299AA02 SPECIAL SERVICES - SCM(UPG BY NTX299AB)
Feature set	SWITCHING
Feature	DDS HAIRPIN
Feature no	F6405

FEATURE SYNOPSIS

This feature adds an option to the SMS hairpin feature that leaves the channel untouched instead of H/W mapping of A/B bits. This will allow DDS circuits to pass through the SMS.

FEATURE DESCRIPTION

This feature is responsible for the implementation of a channel used for digital dataphone service (DDS) hairpin. Connections are established between pairs of p-side channels on a SMS that provide a data loop. This connection is provided upon request from the CC and once requested these connections are maintained until the CC sends a message to the PP to disconnect them.

Ref: DDOC AF0231

NTX299AB01 Status: RTM SPECIAL SERVICES - SCM(UPG OF NTX299AA)

MAINTENANCE AND TESTING	:	
SMS - MAINTENANCE AND TABLE CONTROL FOR NAILED-UP SPECIAL		F3982
SWITCHING	:	
SCM - SMS SPECIAL SERVICES		F5509
DID PBX VIA HAIRPIN		F6404
DDS HAIRPIN		F6405
INTEGRATED LOCAL SPECIALS/SPOTS		F6585

Package	NTX299AB01 SPECIAL SERVICES - SCM(UPG OF NTX299AA)
Feature set	MAINTENANCE AND TESTING
Feature	SMS - MAINTENANCE AND TABLE CONTROL FOR NAILED-UP
Feature no	F3982

FEATURE SYNOPSIS

Pairs of SMS (subscriber module SLC-96) p-side channels can be permanently connected through the SMS on a nailed up basis under table control. Each channel is associated either with a special services line terminated on an interfacing RCS or a channel on another DS-1 facility.

FEATURE DESCRIPTION

Pairs of channels associated with DS-1 facilities terminating on the p-side of the same SMS can be connected (nailed up) in accordance with customer assigned data in table PSNAILUP. Each channel is identified either as a channel on an terminated DS-1 facility which does not connect to another remote of this switch or as a special services line terminated on a RSC interfaced to the SMS.

Connections are established within the SMS and do not involve the network. Connections are transparent to the A/B bit signalling appearing on the channel. Signalling is neither scanned for or inserted in the channel.

This feature supports all three RCS modes of operation however with mode II operation special services lines are restricted to the four rightmost channel unit slots.

BC1374, BC1409, BF0519

Package	NTX299AB01 SPECIAL SERVICES - SCM(UPG OF NTX299AA)
Feature set	SWITCHING
Feature	SCM - SMS SPECIAL SERVICES
Feature no	F5509

FEATURE SYNOPSIS

Pairs of SMS (subscriber module SLC-96) p-side channels can be permanently connected through the SMS on a nailed up basis under table control. Each channel is associated either with a special services line terminated on an interfacing RCS or a channel on another DS-1 facility.

FEATURE DESCRIPTION

Pairs of channels associated with DS-1 facilities terminating on the p-side of the same SMS can be connected (nailed up) in accordance with customer assigned data in table PSNAILUP. Each channel is identified either as a channel on an terminated DS-1 facility which does not connect to another remote of this switch or as a special services line terminated on a RSC interfaced to the SMS.

Connections are established within the SMS and do not involve the network. Connections are transparent to the A/B bit signalling appearing on the channel. Signalling is neither scanned for or inserted in the channel.

FDOC BF0519

Package	NTX299AB01 SPECIAL SERVICES - SCM(UPG OF NTX299AA)
Feature set	SWITCHING
Feature	DID PBX VIA HAIRPIN
Feature no	F6404

FEATURE SYNOPSIS AND DESCRIPTION

When the RCS supports DID PBX circuits the Telco will set up an SMS hair-pin connection and loop back to a DTC that supports PX trunks. This feature utilizes existing software. However, test and V.O. will be carried out to verify its functionality.

Ref: DDOC AF0230

Package	NTX299AB01 SPECIAL SERVICES - SCM(UPG OF NTX299AA)
Feature set	SWITCHING
Feature	DDS HAIRPIN
Feature no	F6405

FEATURE SYNOPSIS

This feature adds an option to the SMS hairpin feature that leaves the channel untouched instead of H/W mapping of A/B bits. This will allow DDS circuits to pass through the SMS.

FEATURE DESCRIPTION

This feature is responsible for the implementation of a channel used for digital dataphone service (DDS) hairpin. Connections are established between pairs of p-side channels on a SMS that provide a data loop. This connection is provided upon request from the CC and once requested these connections are maintained until the CC sends a message to the PP to disconnect them.

Ref: DDOC AF0231

Package	NTX299AB01 SPECIAL SERVICES - SCM(UPG OF NTX299AA)
Feature set	SWITCHING
Feature	INTEGRATED LOCAL SPECIALS/SPOTS
Feature no	F6585

FEATURE SYNOPSIS

This feature enables the Subscriber Module SLC-96 (SMS) to use the AT&T Technologies Channel Unit S9CD271A. This channel unit resides in the SLC-96 Remote Terminal (RT). The S9CD271A is also known as the SPOTS channel unit (Special Plain Old Telephone Service).

This feature additionally verifies that RT Channel Units S9CD271A, S9CD203 and S9CD221 can be used to provide the following, but not limited to, Special Services:

- INWATS (Inward Wide Area Telecommunications Service) lines
- OUTWATS (Outward Wide Area Telecommunications Service) lines
- TWX (TeletypeWriter eXchange) lines
- PBX (Private Branch eXchange) lines.

FEATURE DESCRIPTION

This feature integrates the S9CD271A for use as a single-party POTS line as well as for the above mentioned Special Services. This channel unit can be configured as loop-start or ground-start. All current POTS channel units supported by the SMS provide loop-start. This loop-start or ground-start configuration is determined by datafill.

The S9CD271A card may also be used in nailed-up connections.

This feature also verifies that the currently supported S9CD203 and S9CD221 channel units can be used for INWATS, OUTWATS and TWX. The S9CD203 and S9CD221 channel units are not specifically limited to only these Special Services.

The same tests will be performed for the S9CD271X in both the loop-start and ground-start configuration as is done for single-party channel units. The tests are:

- offhook detection
- onhook detection
- echo return loss
- remove RCS test termination
- single party ringing
- carrier channel loss
- idle channel noise

Ref: DDOC AF0242

NTX380AA02 Status: RTM DUAL RCC

MNTCE AND ADMIN	:	
INTERLINK MAINTENANCE		F6466
CC INTERSWITCHING		F6467
DUAL RCC - INTERLINK MESSAGING		F6468
DUAL RCC - PP LINE INTERSWITCH		F6469
ESA CALL CONTROL		F6470
INTERSWITCHING	:	
DUAL RCC - PERIPHERAL LINE INTERSWITCH ENHANCEMENTS		F6472
ADMINISTRATION	:	
DUAL RCC - INTERSWITCH OPERATIONAL MEASUREMENTS		F6473
MNTCE AND ADMIN	:	
PERIPHERAL TRUNK INTERSWITCH		F6474
DUAL RCC - INTERLINK TABLE CONTROL AND STATIC DATA		F6569
INTER - ESA	:	
DUAL RCC - ESA SYNCHRONIZATION		F6574
CC ESA STATIC DATA		F6575
MAINTENANCE AND TESING	:	
DUAL RCC - PP ESA MAINTENANCE		F6576
MAINTENANCE AND TESTING	:	
DUAL RCC - PP ESA MAINTENANCE ENTRY/EXIT		F6577
INTER - ESA	:	
ESA CALL CONTROL II		F6578
MNTCE AND ADMIN	:	
DUAL RCC - WARM SWACT(PP)		F6579
INTERSWITCHING	:	
DUAL RCC - ESA POTS INTERCALLING		F6580
MNTCE AND ADMIN	:	
DUAL RCC-ESA TRUNKING		F6581
ADMINISTRATION	:	
DUAL RCC-ESA OMS(CC)		F6582
DUAL RCC-ESA OMS(PP)		F6583
DUAL RCC-ESA MDC TRANSLATIONS		F6633
MNTCE AND ADMIN	:	
DUAL RCC - ESA MAINTENANCE		F6634
INTER-ESA	:	
DUAL RCC ESA FORCE DOWN OPTION		F7206

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	INTERLINK MAINTENANCE
Feature no	F6466

FEATURE SYNOPSIS

This feature is part of the feature development for the Dual RSC and provides manual and system maintenance for links that interconnect two Remote Cluster Controllers (RCCs). It provides a new MAP level for the display and control of inter-RCC links, as well as, system maintenance.

FEATURE DESCRIPTION

This feature provides system and manual maintenance for interlinks. System maintenance actions performed automatically by the system include system busy (SysB) and system return-to-service (RTS). System maintenance actions are initiated when a fault occurs on the interlinks. Manual maintenance actions are initiated by requests from a craftperson at the MAP.

Manual Maintenance - A new MAP level called IRLINK is introduced. The commands at this map level provide information concerning the status of interlinks and allow maintenance to be performed on interlinks.

System Maintenance - The functions performed by interlink system maintenance are identical to the SysB and RTS actions for any DS1 link. DS1 maintenance on interlinks is provided as well and in an identical manner to those currently available in DS1 maintenance for c-side DS1s. These include:

- enable/disable monitoring of DS1 circuit's physical presence
- enable/disable maintenance monitoring of DS1 circuits including:
 - counting controlled slips
 - counting frame loss occurrences
 - monitoring levels of bipolar violations (BPV)
 - monitoring remote carrier group alarm (RCGA) indicator
 - monitoring local carrier group alarm (LCGA) indicator
- access to counters and status state of DS1 circuits

Ref: FDOC - AF0551

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	CC INTERSWITCHING
Feature no	F6467

FEATURE SYNOPSIS

This feature provides the CC (Central Control) software required to support line and trunk interswitching in a dual RSC (Remote Switching Center) configuration.

FEATURE DESCRIPTION

This feature extends the lines call processing capabilities for intra-switched line calls to include interswitched line calls.

The limitations on interswitched line to line calls are summarized as follows:

- Single party lines, two party lines, multiparty lines, IBN lines, P_phones and data units are allowed to interswitch.
- Lines with Call Waiting and Three Way Calling are allowed to interswitch but the call is reverted to a network connection when the feature is invoked.
- Originations from any MADN (Multiple Access Directory Number) member are allowed to interswitch. On terminations to a MADN line only the primary is allowed to interswitch.
- The end-to-end signalling feature is allowed on P-phone lines while the call is interswitched

Three scenarios for RCC trunk interswitching are supported as follows:

- trunk to trunk
- line to trunk
- trunk to line.

This feature allows interswitching on dynamic trunks only. A trunk is switched from the assigned intraswitch channel to an interswitch channel during an interswitched call involving a trunk. The intraswitch channel remains reserved for the trunk. If no interswitch channel is available, the call is completed through a network channel, if available. If a network channel is not available, the call receives channel blocking.

A call from outside a dual RSC which terminates on a dynamic trunk is completed through the network.

Ref: FDOC - AF0562

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	DUAL RCC - INTERLINK MESSAGING
Feature no	F6468

FEATURE SYNOPSIS

This feature implements messaging between the two RCCs (Remote Cluster Controllers) that combined form a Dual RSC. Call processing needs this messaging in order to set up an interswitched call. Support for ESA (Emergency Stand Alone) is not provided by this feature.

FEATURE DESCRIPTION

In order to implement an interswitched call, RCC call processing tasks must message across the interlinks. This feature implements interlink messaging. Specifically, this feature:

- Sends and receives messages across the interlinks using DMSX protocol.
- Handles inter-messaging link faults detected by the messaging system.
- Provides support for maintenance action (open, close, maintenance open) performed on the inter-messaging links.

Ref: FDOC - AF0563

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	DUAL RCC - PP LINE INTERSWITCH
Feature no	F6469

FEATURE SYNOPSIS

This feature provides the capability for line to line calls between the two Remote Cluster Controllers (RCCs) of a Dual RSC without the use of network channels. It also includes the interlink channel management. Support for Emergency Stand Alone (ESA) operation mode and custom calling features is not included.

FEATURE DESCRIPTION

This feature provides two functions, the capability of interswitching basic line to line calls of a Dual RSC and the management scheme of interlink channels.

Interswitched calls are defined as the calls that originate on the peripheral side (p-side) of one RCC and terminate on a facility on the p-side of the interconnected RCC without using host link channels. A host link is the link that connects a Line Group Controller (LGC) and an RCC.

Channel management, the other function of this feature, provides a scheme to control the interswitching resources. Channels of the interlinks are the resources. Channel management is responsible for the allocation and deallocation of interlink channels for an interswitched call. Interlink channels are allocated for interswitched calls and deallocated when the call is finished.

If there are not enough interswitching resources available for a call, it is switched using the host link channels without service interruption providing the necessary resources are available.

Ref: FDOC - AF0564

Package	NTX380AA02 DUAL RCC
Feature set	INTERSWITCHING
Feature	DUAL RCC - PERIPHERAL LINE INTERSWITCH ENHANCEMENT
Feature no	F6472

FEATURE SYNOPSIS

This feature is an extension of the PP line interswitch on the dual RCC. It provides the capability to interswitch line to line calls other than POTS.

FEATURE DESCRIPTION

This feature provides interswitching capability for the following call types:

- P-phone line to line calls
- Data unit calls
- IBN feature calls.

When a calling feature is invoked during an interswitched call, the call is reswitched through the host links.

Ref: FDOC - AF0725

Package	NTX380AA02 DUAL RCC
Feature set	ADMINISTRATION
Feature	DUAL RCC - INTERSWITCH OPERATIONAL MEASUREMENTS
Feature no	F6473

FEATURE SYNOPSIS

This feature allows Operational Measurements (OMs) to be collected for OM group, RSCIR. This group is used to peg interswitched calls on the dual Remote Switching Center (RSC).

FEATURE DESCRIPTION

This feature provides OMs for interswitched line to line, line to trunk, trunk to line, and trunk to trunk calls through the new OM group RSCIR. This group will only appear for the Dual RSC. The OM group RSCIR consists of the following counts which will be collected for each RSC:

Traffic Peg Counts

- RSCIRALL - total interswitched line to line call attempts
- RSCIRBLL - total interswitched line to line calls blocked by the all interswitching channels unavailable condition
- RSCIRALT - total interswitched line to trunk call attempts
- RSCIRBLT - total interswitched line to trunk calls blocked by the all interswitching channels unavailable condition
- RSCIRATL - total interswitched trunk to line call attempts
- RSCIRBTL - total interswitched trunk to line calls blocked by the all interswitching channels unavailable condition
- RSCIRATT - total interswitched trunk to trunk call attempts
- RSCIRBTT - total interswitched trunk to trunk calls blocked by the all interswitching channels unavailable condition

Traffic Usage Counts

- RSCIRCBU - total interswitched channels busy based on a 100 second scan rate

Ref: FDOC - AF0726

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	PERIPHERAL TRUNK INTERSWITCH
Feature no	F6474

FEATURE SYNOPSIS

This feature allows line to trunk, trunk to line, and trunk to trunk calls to be made between the two Remote Cluster Controllers (Dual RCC) of a Dual Remote Switching Center.

FEATURE DESCRIPTION

The Dual RCC is two RCCs located in the same Remote Switching Center, interconnected on the C-side by DS1 links called interlinks.

Interswitching is the ability to make calls between the two Remote Cluster Controllers (RCC) in a Dual RCC arrangement. Interswitched calls use channels on the interlinks. Interswitching, in the RCC, can occur when:
The originator is on one RCC and the terminator is on the other RCC of a Dual RCC.

The RCC is able to allocate a channel on the interlink for the call.

Ref: FDOC AF0727

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	DUAL RCC - INTERLINK TABLE CONTROL AND STATIC DATA
Feature no	F6569

FEATURE SYNOPSIS

This feature provides table control software to allow datafill of inter RCC links and to download this data to the RCC.

FEATURE DESCRIPTION

This feature provides the CC software required in the DMS-100 switch to configure a dual remote switching center (RSC). It is required to allow a craftperson to datafill the inventory table for dual RSC and send the necessary static data to the two remote cluster controllers (RCCs) being configured or reconfigured as dual.

To configure or reconfigure a dual RSC, this feature performs two distinct functions namely Table Control for table "IRLNKINV" and the Static Data Download.

Ref: FDOC - AF0932

Package	NTX380AA02 DUAL RCC
Feature set	INTER - ESA
Feature	DUAL RCC - ESA SYNCHRONIZATION
Feature no	F6574

FEATURE SYNOPSIS

The Dual Remote Cluster Controller (Dual RCC) Emergency Stand Alone (ESA) Synchronization feature allows one RCC to use the spouse RCC as the synchronization source when either one or both RCCs are in ESA and communication with the host has been lost. When both RCCs are in ESA, synchronization is required before Dual RCC ESA is entered, because without it, speech transmission is not stable.

FEATURE DESCRIPTION

In non-ESA mode, each RCC of the Dual RCC follows the timing of its host LGC or host LTC. When communication with the host is lost, the RCC goes into ESA. This emergency service feature permits local calling within the RCC. In ESA mode, if the internal XPM clock in the active unit has no frame pulse to follow, it goes into "free run" mode in which there is no dynamic adjusting of the clock.

To transmit speech, the RCCs must be synchronized with the same source (be it the network or each other). This feature allows the RCC to establish synchronization to a new source - its spouse RCC. As long as the two RCCs are synchronized to the same source, and both are either in ESA or both are in non-ESA mode, they can interswitch calls.

Ref: FDOC - AF0950

Package	NTX380AA02 DUAL RCC
Feature set	MAINTENANCE AND TESING
Feature	DUAL RCC - PP ESA MAINTENANCE
Feature no	F6576

FEATURE SYNOPSIS

This feature handles changes in the status of the c-side interlinks between RCCs (Remote Cluster Controllers) in a dual configuration when those RCCs are in Emergency Stand Alone Mode (ESA). Further, the handling of rebounded interlink messages is enhanced through link testing prior to link closure. Closure results in the take down of existing calls on the link and removal of the link's channels from the call processing free pool.

FEATURE DESCRIPTION

PP ESA Maintenance establishes communication between Interlink Maintenance and the ESA Maintenance Task (ESAMTC) so that interlink status changes result in the appropriate action.

In addition, a second chance is added to the handling of rebounded messages whether or not the RCC is in ESA mode. When a message rebounds, a test message will be sent over the questionable link rather than closing the messaging interlink immediately. As such, existing calls are not taken down, although, the link channels are not available for call processing. If the test message is acknowledged, link channels are reopened for call processing. Otherwise, calls are taken down and link channels are unavailable to link processing until the link becomes operational.

Ref: FDOC - AF0952

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	DUAL RCC - WARM SWACT(PP)
Feature no	F6579

FEATURE SYNOPSIS

This feature is responsible for providing the inactive unit of an RCC (Remote Cluster Controller) with the data required to maintain established line to line interswitched calls and to ensure normal RCC processing when a warm swact (Switch of ACTivity) occurs. Interswitched calls in a transient state such as dialing or ringing will be dropped when a warm swact occurs.

FEATURE DESCRIPTION

This feature is part of the Dual RSC development. It supports two areas for warm swact of dual RCCs as follows:

- Interlink Maintenance
- Line Interswitching

Interlink Maintenance - When the state of an interlink changes, the inactive unit of each RCC will be informed of the interlink's new state. If a warm swact occurs during a state change, the newly active unit will complete the state change of the interlinks, once it becomes INSV active.

Line Interswitching - Additional call processing information is transferred to the inactive unit of each RCC so that interswitched calls can survive a warm swact. The information transferred contains originating and terminating call setup data. Once an interswitched call is established, this call processing information is transferred to the inactive unit. If a warm swact occurs, established calls are preserved.

Ref: FDOC - AF1011

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	DUAL RCC-ESA TRUNKING
Feature no	F6581

FEATURE SYNOPSIS

This feature allows line to trunk, trunk to line, and trunk to trunk calls to be made between two Remote Cluster Controllers (RCC) when they are in Dual Emergency Stand Alone (DESA) mode.

FEATURE DESCRIPTION

The Emergency Stand Alone option provides the limited call processing service to process calls originating and terminating within the same RCC. When RCCs in the dual configuration are in the ESA mode, a limited set of calls originating in one RCC and terminating on the other RCC can be completed.

Ref: FDOC AF0954

Package	NTX380AA02 DUAL RCC
Feature set	ADMINISTRATION
Feature	DUAL RCC-ESA OMS(CC)
Feature no	F6582

FEATURE SYNOPSIS

This feature allows the existing PM171 log to display the Operational Measurements (OM) for the intraswitched calls made on a single Remote Switching Center (RSC), the interswitched or intraswitched calls made on a Dual RSC, and the calls made on a Remote Line Concentrating Module (RLCM) while in Emergency Stand Alone (ESA) mode.

FEATURE DESCRIPTION

The Emergency Stand Alone (ESA) mode is an emergency service option of the Remote Cluster Controller (RCC) or Remote Line Concentrating Module (RLCM) that provides limited call processing capabilities when communications between the host and the RCC or the RLCM are lost.

The ESA mode is entered due to a failure in the messaging links to the host or a failure of the host to provide call processing.

Intraswitching and interswitching provide the capability of switching calls at an RCC without requiring transmission back to the host. An intraswitched call is a call whose originator and terminator reside at the same RCC. An interswitched call is a call whose originator and terminator reside in two different RCCs connected in a Dual RCC configuration.

The RCC or the RLCM stores a number of call processing OMs while in ESA mode. These OMs are forwarded to the host switch and printed as a PM171 log after the RCC or the RLCM exits ESA mode. For the Dual RCC, two PM171 logs are printed, one for each RCC.

Ref: FDOC AF0955

Package	NTX380AA02 DUAL RCC
Feature set	ADMINISTRATION
Feature	DUAL RCC-ESA OMS(PP)
Feature no	F6583

FEATURE SYNOPSIS

This feature provides separate intraswitch and interswitch pegs for calls occurring while a Remote Cluster Controller (RCC) is in Emergency Stand Alone (ESA) mode. These pegs will be output in a PM171 log when the RCC has regained communication with the host.

FEATURE DESCRIPTION

When a Remote Cluster Controller or Remote Line Concentrating Module enters Emergency Stand Alone mode, the Central Control (CC) is not able to record the various call events which occur in that peripheral. Therefore the RCC or RLCM must record these events. When the peripheral regains communication with the CC and exits ESA, the RCC or RLCM can send these records or pegs to the CC.

This feature changes the pegs output in PM171 log in two ways:
Additional information is provided for intraswitching calls in the RCC and RLCM while they are in ESA.
New pegs are provided for interswitched calls on a Dual RCC while it is in ESA.

The pegs are sent to the CC on ESA exit and printed in a PM171 log.

Ref: FDOC AF0956

Package	NTX380AA02 DUAL RCC
Feature set	ADMINISTRATION
Feature	DUAL RCC-ESA MDC TRANSLATIONS
Feature no	F6633

FEATURE SYNOPSIS

This feature increases call processing services to a Dual Remote Cluster Controller (RCC) in Emergency Stand Alone (ESA) mode.

The services provided by this feature include the following:
routing of calls within the same Meridian Digital Centrex (MCC) customer group to terminations on the mate RCC
the capability to hunt for an idle line on hunt group lines off the mate RCC
support for Automatic Lines (AUL) terminating on the mate RCC.

FEATURE DESCRIPTION

Customer Group Services

This feature extends the call processing services provided for lines on MDC customer groups located on a single RCC while in ESA mode to lines located on a mate RCC of a Dual RCC configuration in Dual ESA mode.

Hunt Group Lines

This feature supports calls to hunt groups located on the mate RCC and calls to hunt groups where the hunt group members are distributed across the two RCCs in a dual configuration.

Automatic Lines

This feature supports Automatic Lines (AUL) calls originating on one RCC and terminating on the mate RCC while in dual ESA mode.

Ref: FDOC AF1074

Package	NTX380AA02 DUAL RCC
Feature set	MNTCE AND ADMIN
Feature	DUAL RCC - ESA MAINTENANCE
Feature no	F6634

FEATURE SYNOPSIS

This feature allows interswitched calls to be made between two Remote Cluster Controllers (RCCs) when RCCs in the dual RCC configuration are in the Emergency Stand-Alone (ESA) mode of operation.

FEATURE DESCRIPTION

Interswitching between two RCCs in a Dual RCC configuration while both RCCs are in ESA is possible if the following conditions are met:
Each RCC is in single ESA
Interlink DS1 Frame Synchronization is established between RCCs
Each RCC can message to its mate RCC using the interlinks.

Ref: FDOC AF0950, FDCO AF0952, FDOC AF0953

Package	NTX380AA02 DUAL RCC
Feature set	INTER-ESA
Feature	DUAL RCC ESA FORCE DOWN OPTION
Feature no	F7206

Synopsis

This feature allows one remote cluster controller (RCC) of a dual RCC configuration to be forced into the emergency stand alone (ESA) state when the other RCC enters ESA. This allows inter-switching of calls between the two RCCs to continue.

This feature also keeps both RCCs in ESA until both are able to exit.

Without this feature, the non-ESA RCC remains in communication with the host, but the ability to inter-switch calls between the ESA and non-ESA RCCs is lost.

Implementation

Table IRLNKINV: parameter ESAFORCE is set to 'Y'. The static data in both RCCs is updated.

Log PM189 "Force Down" message is sent to the CC when an RCC is forced into ESA. This message indicates that no fault has occurred, even though the RCC has entered ESA.

If interlink communication is lost while one RCC is in Force Down, the office parameter RSC_ESAENTRY_BADLINK in Table OFCENG is used to determine the amount of time that the RCC remains in Force Down waiting for interlink communication to be restored. If communication has not been restored by the end of this time, then the RCC exits Force Down, and is returned to service in the usual manner.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX145AA Remote Switching Centre
- NTX150AA RSC - Intra-RSC Calling
- NTX269AA Universal Tone Receiver (Domestic)
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The ability to keep both RCCs in ESA until both are able to exit is lost if the LGC/LTC c-side of an RCC in Force Down is busied after that RCC has entered ESA, and is still busy at the time that the other RCC becomes ready to exit ESA.

Reference: FDOC AF1512

NTX381AA01 Status: RTM RSC - REMOTE - OFF REMOTE

RSC - REMOTE OFF REMOTE :
RLCM OFF RCC

F6287

Package	NTX381AA01 RSC - REMOTE - OFF REMOTE
Feature set	RSC - REMOTE OFF REMOTE
Feature	RLCM OFF RCC
Feature no	F6287

FEATURE SYNOPSIS

This feature provides the software to support the connection of RLCMs to the p-side of a remote cluster controller. The features which are provided for an RLCM off an LTC will be supported for an RLCM off an RSC.

FEATURE DESCRIPTION

The remote-off-remote configuration allows several smaller sites to be remoted off the site serviced by the RCC. This facilitates the conversion of small offices to DMS-100 and with intraswitching, the DSL requirements are kept to a minimum. An RLCM off an RSC may have intra-switching, ESA, RMM and carrier maintenance.

RLCMs off RSCs must be within 80 km of the RSC while the total host RSC/RLCM distance must be within 160 km.

Ref: DDOC AG0327

Package	NTX385AA01 OM THRESHOLDING AND ALARMS
Feature set	ADMINISTRATION
Feature	OM THRESHOLDING AND ALARMS
Feature no	F2576

FEATURE SYNOPSIS

This feature provides the telco with thresholding and alarming capabilities for OMS on a selectable basis. A new table, modifiable by the telcos, is provided in which OMS are identified and scan rates, thresholds and alarm conditions are set. Scan rates between 1 and 70 minutes are assignable to each individual table entry.

NTX386AA03 Status: RTM ACCESS TANDEM SWITCH

ACCESS TANDEM	:	
AT - TERMINATING BILLING		F1740
AT - TRANSLATION AND SCREENING		F3437
AT - TRUNKING		F3438
AT - TREATMENTS		F3439
AT - OPERATIONAL MEASUREMENTS		F3440
ATT - LOG REPORTS		F3441
EQUAL ACCESS END OFFICE(EAEO)	:	
EA - CC REAL TIME IMPROVEMENT		F5425

Package	NTX386AA03 ACCESS TANDEM SWITCH
Feature set	ACCESS TANDEM
Feature	AT - TERMINATING BILLING
Feature no	F1740

Terminating Billing of Equal Access calls is provided. All completed Equal Access calls terminating to an end office through the Access Tandem (AT) are recorded at the AT. The terminating access record is in standard ATT AMA format as call code 119.

Package	NTX386AA03 ACCESS TANDEM SWITCH
Feature set	ACCESS TANDEM
Feature	AT - TRANSLATION AND SCREENING
Feature no	F3437

The Equal Access Plan permits equal switched access to all InterLATA Carriers (IC's). A new type of signaling common to all IC's is provided. The new signaling involves two stages. The first stage allows the Access Tandem (AT) to determine by digits received from the end office, to which IC the call is routed. The AT seizes a trunk to the IC and cuts through a path to the end office. The second stage consists of outpulsing ANI and called digits from the end office through this path to the IC. Additional information can be found in feature F3438.

Package	NTX386AA03 ACCESS TANDEM SWITCH
Feature set	ACCESS TANDEM
Feature	AT - TRUNKING
Feature no	F3438

The Equal Access plan requires that an AT provide dedicated trunks (one or more) for each carrier it serves. A new trunk type is introduced to carry Equal Access traffic between AT and a carrier. The new trunk type (ATC) is compatible with SC and IT trunk types.

A universal AT trunk type for traffic of all types (0 + , 1+, CN) from the EAEO will be developed (planned for BCS-16). The new EA intersystem signaling is supported consisting of additional winks, regeneration of these winks to the end office, recognition of non-standard duration winks, and the timing between winks.

Package	NTX386AA03 ACCESS TANDEM SWITCH
Feature set	ACCESS TANDEM
Feature	AT - TREATMEMTS
Feature no	F3439

New treatments needed for call completion failures in an Equal Access environment are provided. Treatment of call failure between the AT and the IC, and the AT and the EAE0 are provided.

Package	NTX386AA03 ACCESS TANDEM SWITCH
Feature set	ACCESS TANDEM
Feature	AT - OPERATIONAL MEASUREMENTS
Feature no	F3440

Operational Measurements unique to the AT are introduced. These measurements are on a per InterLATA Carrier (IC)/ International Carrier (INC) basis. The operational measurements needed on the trunks between the end office and the AT, and IC/INC and the AT, are handled by the existing trunk operational measurements.

Package	NTX386AA03 ACCESS TANDEM SWITCH
Feature set	ACCESS TANDEM
Feature	ATT - LOG REPORTS
Feature no	F3441

This feature covers the logs unique to the AT. A log is generated where the AT does not receive the first start pulsing wink on IC calls and either the first or second start pulsing winks on INC calls. In addition, logs are generated when state changes occur between the AT and the IC/INC trunk.

Package	NTX386AA03 ACCESS TANDEM SWITCH
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EA - CC REAL TIME IMPROVEMENT
Feature no	F5425

FEATURE SYNOPSIS

The purpose of this feature is to reduce the real time used for equal access calls. This is accomplished by changing central control software dealing with: i) digit collection, and ii) AMA billing.

FEATURE DESCRIPTION

i) Overlap carrier selection (OCS) feature (F3920) added recently had a real time impact on both OCS and non-OCS calls. Present feature (F5425) offsets this real time impact on non-OCS calls by allowing OCS to co-exist with line to DP trunk overlap outpulsing. A new office parameter has been created (EA_OCS_AND_DP_OVLP_NEEDED).

ii) The changes to the billing software are two-fold:

- a) Formatting of equal access AMA records has been streamlined and made more efficient.
- b) Formatting is done out of the CCB rather than forcing into a recording unit.

References

FDOC BC1380

NTX387AA04 Status: RTM SMU - SUBSCRIBER MODULE URBAN

ADDN. MNTCE CALL PROCESSING	:	
SMU CC MMI		F6014
MAINTENANCE CALL PROCESSING	:	
SMU BASIC RTS		F6015
MNTCE ADMIN CALL PROCESSING	:	
SMU CALL PROCESSING MODE AND LINE MNTCE		F6016
MAINTENANCE AND TESTING	:	
SMU MAINTENANCE AND OMS		F6017
MAINTENANCE	:	
SMU ALARMS/CHANNEL REASSIGNMENT		F6018
ADMINISTRATION CALL PROCESSING	:	
SMU OAM ENHANCEMENT		F6020
MAINTENANCE AND TESTING	:	
SMU AUTOMATIC BOARD-TO-BOARD TEST		F6169
CALL PROCESSING	:	
SMU IBN		F6171
MAINTENANCE AND TESTING	:	
SHARED METALLIC TEST ACCESS		F6172
MAINTENANCE	:	
RCU CARRIER MAINTENANCE ENHANCEMENTS		F6173
MAINTENANCE AND TESTING	:	
SMU WARM SWACT (PP)		F6217
CALL PROCESSING	:	
SMU COIN CAPABILITY		F6221
MAINTENANCE	:	
SMU LINE MTCE - COIN, FXB (PP)		F6251
CALL PROCESSING	:	
SMU FORWARD DISCONNECT(PP)		F6252
SMU EXPANDED RCU CONNECTIONS(PP)		F6253
MAINTENANCE	:	
PROGRAMMABLE SPARE ALARMS FOR RCU		F6304
RCV OFFICE PARAMETER		F6406
MAINTENANCE AND TESTING	:	
AUTOMATIC SYSTEM TEST FOR RCU		F6573

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	ADMIN. MNTCE CALL PROCESSING
Feature	SMU CC MMI
Feature no	F6014

FEATURE SYNOPSIS

This feature provides maintenance and MMI capabilities to DMS-100 for SMU as follows:

- software to download static data to SMU
- the ability to datafill RCU lines in table LNINV
- the ability to post a RCU from the PM level of the MAP.

FEATURE DESCRIPTION

The different aspects of the features are:

1. This feature provides the capability to download static data from the DMS-100 to the subscriber module DMS-1 urban (SMU) peripheral module at Return_To_Service (RTS) of the SMU.

2. Second portion of the feature:

- allows subscriber lines connected to the remote carrier urban (RCU) peripheral to be datafilled in the DMS-100's line inventory (LNINV) table.
- translates the line numbering format seen by a craftsperson at central control (CC) into the format seen at the RCU itself, and vice versa.
- enforces restrictions on RCU party lines during the datafill and service order (SERVORD) operations.

3. The third portion of the feature supports the man machine interface which allows maintenance activities to be performed on the remote carrier DMS-1 urban (RCU). The capability is provided to post the RCU for maintenance actions on a DMS-100 maintenance and administration position (MAP). Trnsl (translate) command and query PM (query peripheral module) command are implemented by this feature.

Ref: FDOCs: BC1725, BC1726, BC1728

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE CALL PROCESSING
Feature	SMU BASIC RTS
Feature no	F6015

FEATURE SYNOPSIS

This feature provides:

- basic maintenance support for RCU
- basic maintenance support for SMU
- message processor software
- static data software for SMU
- SMU messaging hooks

FEATURE DESCRIPTION

1. This feature supports maintenance tasks for the following commands for RCU basic maintenance:

RTS - return to service
BSY - busy
OFFL - off line

2. The following SMU capabilities are provided:

datafill for SMU
datafill for p-side links of the SMU
post an SMU for maintenance (PM level of MAP)
post the SMU p-side links (carrier level of MAP)

3. This feature provides MSG processor software to establish and maintain communication between DMS-1 urban and SMU or CT.

4. Capability is provided for CC to send static data to SMU which sends the data to rCU before RCU goes into service. (Static data is equipment information ie, configuration of line card, link, or processing node.)

5. This feature provides SMU messaging hooks which permit addition or deletion of RCU nodes to/from messaging system, and translation of SMU message formats to the RCU message format and vice-versa.

Ref: GFX317AA Subscriber Module Urban (SMU)

FDOCs: BC1685, BC1686, BF0585, BF0587, BF0599

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MNTCE ADMIN CALL PROCESSING
Feature	SMU CALL PROCESSING MODE AND LINE MNTCE
Feature no	F6016

FEATURE SYNOPSIS

This feature provides:

- line maintenance support for the RCU
- miscellaneous enhancements to RCU PM maintenance
- the capability to add and delete entries in the RCU inventory table
- maintenance software for SMU and RCU
- basic call processing software for SMU
- subscriber loop and line card test software for SMU
- message channel recovery software for SMU
- frequency selective ringing support software for SMU

FEATURE DESCRIPTION

1. This feature provides support in DMS-100 for line tests of DMS-1 Urban. It also extends as many existing line tests as possible to RCU lines.

2. CC software is provided to perform maintenance tasks on the RCU. The following maintenance functions are covered:

- manual actions from the RCU MAP level
- manual action from the SMU MAP level
- system actions

3. Allows craftsperson to datafill RCUs on the DMS-100 by introducing a new table RCUINV.

4. Provides the following peripheral software features:

- I/F to CC MAP commands used to perform maintenance on SMU and RCU
- I/F to CC for performing the RCU 24 hour switchover
- Capability to dynamically update RCU provisioning data
- I/F between CC and RCU for controlling RCU maintenance faceplate and MAP command interactions

5. Provides SMU basic call processing software:

- establishing speech connections from DMS-100 network to RCU
- handling steps to terminate a call on RCU
- computing DTSR OM

6. Provides loop and line card testing for SMU

- single end test
- end to end test
- overseas metallic test pair measurements initiated by DMS-100 CC
- overseas jack access test requests from RCU.

7. Provides message channel management between SMU and RCU:

- recovery under failure of message channel
- maintenance tasks (return to service, manual MB) on message link from MAP.

8. Provides frequency selective ringing (FSR) support for SMU/RCU:

- 2 pty bridged - ANI
- 4 pty bridged - ONI

Ref: GFX371AA Subscriber Module Urban (SMU)

FDOCs: BC2154, BC2156, BC2160, BC1724, BF0586, BF0588, BF0590,
BF0591, BF0593

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MANTENANCE AND TESTING
Feature	SMU MAINTENANCE AND OMS
Feature no	F6017

FEATURE SYNOPSIS

This feature enables the DMS-100 to perform RCU system audits and 24 hour switchover exercise of all backup packs into active mode. In addition, maintenance support for SMU peripheral side, P-side, DS-1 links is provided.

FEATURE DESCRIPTION

This feature implements an audit for the RCU which operates on a 10 minute interval. Audits are maintenance and verification procedures scheduled by an audit task. Each will detect faults in a particular set of software/hardware without affecting operationality (i.e., the ability to perform call processing).

Backup circuit packs for common equipment (CE) are switched over to an active status every 24 hours. 24-hr switchover is performed during the time interval specified in office parm LCDREX_CONTROL; all failures are alarmed. During 24-hour switchover, new calls (originating or terminating) are inhibited up to 30 seconds. 24-hr switchover does not affect calls in audible ringback or talking state.

This feature also performs maintenance actions on the SMU p-side DS-1 links connected to DMS-1 urban remote terminals (RCU). These actions consist of:

- maintaining overall link status
- sending alarms to the RCU for faults detected at either end
- invocation of channel reassignment
- link testing as requested by the CC.

Ref: FDOC BC2155
FDOC BF0995

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MANTENANCE
Feature	SMU ALARMS/CHANNEL REASSIGNMENT
Feature no	F6018

FEATURE SYNOPSIS

This feature provides:

- Capability to the central control (CC) to process unsolicited messages from RCU using SCM as interface.
- Channel reassignment to relocate calls from channels on faulty links to free channels in properly functioning links.
- Alarm messages forwarding, processing and response to CC query alarm command.
- SMU, RCU consistency auditing.
- SMU timeswitch circuit card A/B bit diagnostics.

FEATURE DESCRIPTION

1. Two types of unsolicited messages, initialization reports and alarm reports, from the RCU are processed by the CC. Corresponding responses are invoked according to the severity of alarms and timing and condition at the initialization.

2. Channel reassignment is invoked under the following conditions:

- DS-1 framing is lost
- DS-1 card is removed
- a link is speech closed,

according to the priority

1. Dedicated lines in either the talking or ringing state.
2. Non-dedicated lines in the talking state.
3. Non-dedicated lines in the ringing state.

The following situations are considered:

- multiple link failures
- channel blockage
- RCU control processor switchover
- RCU system reset
- loss of messaging
- busying a link.

3. SMU provides alarm forwarding from RCU to CC by acting as interface. SMU also processes locally the alarms by performing particular actions on its own to alleviate or circumvent potential problems. SMU provides the status of alarms on an RCU to CC if requested via (QUERYPM).

4. SMU (PP) audits contains a set of audits to maintain consistency between the SMU and its RCUs.

The audits that make up SMU basic audits are:

a) Ring Pad Card Audit - verifies the existence of the card 1 msec interrupt and the sanity of the ring pad card (NT6X80BA). Other tests on the NT6X80BA card have already been coded.

b) Unsolicited Report Handler - handles invalid reports from the RCU. These reports arrive in messages.

c) Timeswitch Connections Audit - corrects timeswitch connection discrepancies between the SMU and the RCU. It is run on every RCU after warm switch activity (SWACT).

d) On Demand Connection Takedown Task - maintains consistency between the SMU and the RCU timeswitch connection records on an inservice system. The takedown connection is requested by an applications task, not by the craftsperson.

e) This feature also provides A/B bit diagnostics for the NT6X44CA timeswitch card. The NT6X44CA timeswitch card processes the signalling bits from p-side without establishing connection.

Ref: FDOCs BC2161, BF0592, BF0610,, BF0994, AF0147

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	ADMINISTRATION CALL PROCESSING
Feature	SMU OAM ENHANCEMENT
Feature no	F6020

FEATURE SYNOPSIS

This feature provides operator verification for RCU lines, operational measurements and dial tone speed recording (DTSR) measurement.

FEATURE DESCRIPTION

Operator verification enables an operator to determine whether or not a given line is busy, by monitoring the on-going conversation. It is useful to distinguish the three parties involved in operator verification as follows: the monitored line, the other party which is involved in a 2-way conversation with the monitored line and the monitoring agent (operator). This feature provides operator verification by setting up a 3-way conference call with the three parties.

Operational measurement is a traffic measurement system used by telcos to avoid two situations:

- An excess of switching paths and equipments results in idle and unused facilities and unnecessary cost.
- A shortage of switching paths and equipment results in equipment overload and poor telephone service.

Quantities to be counted fall into two categories: peg counts and usage counts. Three OM groups, PM, PMTYP and SITES are affected.

DTSR is used to measure the ability of the switch to return dial tone within three seconds. This data is useful for office performance measurements. DTSR information is gathered and stored as OM.

Ref: AF0055
BC2159

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE AND TESTING
Feature	SMU AUTOMATIC BOARD-TO-BOARD TEST
Feature no	F6169

FEATURE SYNOPSIS

This feature modifies the Automatic Board-to-Board Test (ABBT) to support the cutover of a Digital Multiplex System-1 Urban (DMS-1U) Remote Terminal (RT) from an old switch to a DMS-100. Also supported is the cutover of the DMS-1R RT from the DMS-1U Central Terminal (CT) to the Subscriber Module Urban (SMU) in an existing DMS-100.

FEATURE DESCRIPTION

ABBT is used to verify the one-to-one correspondence of lines connected to an old switch and a new DMS-100. This test is performed before transfer of service (cutover) to the DMS-100 switch. ABBT determines if the Directory Number (DN) assigned to a subscriber line in the old office corresponds to the DN assigned to the same subscriber line in the DMS-100.

This feature implements a new ABBT method for subscriber lines served by a DMS-1U RT on the old office. The DMS-1U RT is known in the DMS-100 context as the RCU (Remote Carrier Urban). The RCU interfaces to the DMS-100 via the SMU; which replaces the CT.

The reason for a new ABBT method on RCU lines is the difference in the cutover procedure. Cutover from an old switch to a new DMS-100 involves moving the subscriber lines from the old office to the DMS-100. Before cutover the subscriber lines are connected to the distribution frames of both the old and new switches.

Cutover from a DMS-1U CT to a SMU involves moving the DS1 links from a CT to a SMU. Since the RCU lines are connected only to the RCU and the RCU is still connected to the old office the new office does not have access to the subscriber lines. ABBT requires both the old and new switches to have access to the subscriber line.

Ref: FDOC AF0156

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	CALL PROCESSING
Feature	SMU IBN
Feature no	F6171

FEATURE SYNOPSIS

This feature provides IBN features on DMS-100U. The feature set provided will include all IBN features which can be physically supported by the DMSIU remote terminal.

FEATURE DESCRIPTION

This feature provides integrated business network (IBN) features on the DMS-100 urban (DMS-1U). Since the subscriber module urban (SMU) does not support trunks, features involving trunks require that they terminate on equipment other than SMU. Also, station features are limited to 500/2500 sets and attendant consoles since SMU does not support electronic business sets (EBS) or data units. The list of features and packages supported can be found from FDOC AF0179.

Ref: DDOC AF0179

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE AND TESTING
Feature	SHARED METALLIC TEST ACCESS
Feature no	F6172

FEATURE SYNOPSIS

This feature has two distinct functions which are:

1. To delete the implementation of the MTAOWNER method of configuring and controlling the shared Metallic Test Access (MTA) environment.
2. To provide support for the validation and utilization of the new method of configuring and controlling the shared MTA environment.

FEATURE DESCRIPTION

The MTA is a device used to provide DC connections between test circuits and line circuits. Wire pairs (called metallic test pairs on just test pairs) originate at the connections on the MTA and terminate to lines or to the devices the lines reside on. In order to reduce costs by reducing the number of test pairs needed to provide test access to the lines on these devices, the devices are allowed to share a test pair. However, the original method used to configure and control the sharing concept had the following disadvantages:

1. The datafill to configure the setup was both complex and awkward.
2. Tedious and bothersome restrictions were imposed when a device which shared a test pair was to be removed from datafill.
3. The limit on the number of devices which could share a test pair was based on restrictions imposed by the method itself and not by a standard based on number of lines per test pair.

In order to improve the method of configuring and controlling the shared MTA environment, the new method provides the following:

1. The flexibility to assign and unassign devices to a test pair at anytime with no restrictions regarding order.
2. The ability to datafill multiple devices against a vertical in table MTAVERT.

This feature encompasses the following functions:

1. Provides support for the validation of the configuration as well as the utilization of the new method for test access purposes.
2. Phases out the original method (the MTA owner method).

3. The Remotes Carrier DMS-1 Rural (RCT) and the Remote Carrier SLC-96 (RCS), both originally part of the MTA-owner method, are converted over to the new method while the RCU, originally not part of the shared environment, is integrated into the new method.

Ref: DDOC AF0148

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE
Feature	RCU CARRIER MAINTENANCE ENHANCEMENTS
Feature no	F6173

FEATURE SYNOPSIS

This feature provides the ability to display bipolar violation count (BPV) counts on DS-1 carriers as recorded by the RCU. Also, the feature provides the ability TP process remote carrier group alarms generated by the RCU.

FEATURE DESCRIPTION

In the DMS-1 urban system there exists from one to eight DS1 digital links. These links, depending on if they are message or speech, carry subscriber signals and system control signals, or just system control signals, between the subscriber module DMS-1 urban (SMU) and the RCU. Each link consists of four wires. (See figure fn-1.) Two wires carry signals toward the SMU and two carry signals from the SMU (toward the RCU). Because the signals on a link travel in two directions, link events such as critical and noncritical faults (see SMU LINK MAINTENANCE feature for fault definitions) are detected and stored at both the SMU and RCU. The information stored about the SMUs incoming signals include alarm, frame, slip and bipolar violations (BPV) counts, whereas only the BPV count is stored for the RCUs incoming signals.

This feature provides the ability to poll the RCU for information it has stored about link related faults. This information is then displayed with the DETAIL command and the REMote parameter, or by POST with the REM parameter at the CARRIER level of the MAP. This information is important because although invalid signals do not always raise an alarm, they may signify the deterioration of a link.

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE AND TESTING
Feature	SMU WARM SWACT (PP)
Feature no	F6217

FEATURE SYNOPSIS

This feature provides the ability to retain calls in the talking state over the SMU warm activity switch.

FEATURE DESCRIPTION

The warm switch of activity, SWACT, feature is responsible for updating the subscriber module urban, SMU, inactive unit with data so that established calls can be maintained and normal SMU processing may proceed when activity is gained. Established calls are those in the talking state. Calls in a transient state of dialing or ringing are dropped.

The four areas of warm SWACT process implemented are:

- static data
- bulk data update
- dynamic data update
- gaining activity

Ref: DDOC AF0233

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	CALL PROCESSING
Feature	SMU COIN CAPABILITY
Feature no	F6221

FEATURE SYNOPSIS

This feature provides interface software to support coin first, dial tone first and semi-post pay coin service for the SMU/RCU system.

FEATURE DESCRIPTION

The coin SMU capability feature provides coin line support for the subscriber module urban (SMU). The SMU is a peripheral module used as the interface between the remote carrier urban (RCU) and the DMS-100. Coin line support for the SMU/RCU system consists of:

- a) translating the CC coin commands into the signals that the RCU expects for coin control.
- b) responding to the CC with regard to coin commands in the same way as other peripherals.
- c) implementing reverse and normal battery for the SMU.
- d) implementing ringing for coin phones.

The SMU supports three types of coin service: coin first, prepay and semi-post pay.

Ref: DDOC BF0597

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE
Feature	SMU LINE MTCE - COIN, FXB (PP)
Feature no	F6251

FEATURE SYNOPSIS

This feature provides test cases and documentation for the BCS-23 release of line testing on coin and FXB line cards.

FEATURE DESCRIPTION

This feature provides only designer test cases for line testing on coin and FXB lines. Any changes to the functional and design details of line testing on these lines will be made in the BF0590 DDOC.

This feature tests both local line tests and end to end line tests on coin lines and FXBs lines, but only local line tests on FXBO lines. Local line tests refer to a set of tests that is run under control of the Remote Carrier Urban (RCU). End to end tests are tests run under control of the Central Control (CC) with the subscriber module urban (SMU) peripheral.

In addition to testing local and end to end line test capability test cases will be run to verify the following on coin and FX line cards:

- Jack access capability
- LTU bypass capability
- Station ringer test
- Tests from the LTPMAN level of the DMS-100 MAP
- Tests from the LTPLTA level of the DMS-100 MAP.

Ref: DDOC AF0268

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	CALL PROCESSING
Feature	SMU FORWARD DISCONNECT(PP)
Feature no	F6252

FEATURE SYNOPSIS

This feature provides the capability in SMU to "Open Tip" on a line when a call is in progress. This is done at the command of the Central Control (CC) to release a bridged connection on a keyset phone (keyset is not to be confused with p-phone).

FEATURE DESCRIPTION

Forward Disconnect is a line signal used to implement the Cutoff on Disconnect option on a single party line. Cutoff on Disconnect (COD) can be datafilled as an option on POTS lines for use with key telephone sets. The Subscriber Module Urban (SMU) implementation of COD requires that Foreign Exchange - Station (FXBS) line hardware (NT3A11 line card carrier, NT3A12 line card) be used in the DMS_1U RT, instead of POTS line hardware (NT3A06 line card carrier, NT3A10 line card).

COD is already implemented in DMS-100. This feature provides the capability to use COD on Remote Carrier Urban (RCU) lines. The capability is provided by using the Forward Disconnect signal on a line when COD is required.

Forward disconnect is used to release the hold bridge on a key set when the party on hold disconnects from the call. Disconnecting the hold bridge will cause the hold light on the telephone set to go out, indicating that the party that was on hold has gone onhook. The analog signal sent by the RCU to the phone set is Tip Open and Ring -48V.

The SMU will not support the forward disconnect signal on a line during a channel reassignment of the DSO channel to the line or during a warm SWACT of the SMU units.

Ref: DDOC AF0269

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	CALL PROCESSING
Feature	SMU EXPANDED RCU CONNECTIONS(PP)
Feature no	F6253

FEATURE SYNOPSIS

This feature increases the number of RCUs from 8 to 10 to be served by a single SMU.

FEATURE DESCRIPTION

The subscriber module urban (SMU) peripheral software originally supported a maximum of only 8 remote carrier urbans (RCU) off a single SMU node. It is desirable to support 10 RCU off a single SMU since each SMU has as many as 20 DS1 links and each RCU can connect to the SMU with as few as 2 links. Thus, under a feasible configuration, the SMU may have left over DS1 links, but not be able to add RCUs. This feature increases the maximum number of RCUs that SMU peripheral software can support from 8 to 10. The additional support capabilities saves installation and maintenance costs in situations that require several minimally configured RCUs to be supported by a single central office.

Ref: DDOC AF0270

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE
Feature	PROGRAMMABLE SPARE ALARMS FOR RCU
Feature no	F6304

FEATURE SYNOPSIS

This feature provides the craftsman the ability to dynamically associate a character string with an RCU spare alarm.

FEATURE DESCRIPTION

This feature allows the maintenance person to dynamically associate a text string with each spare alarm on each RCU. This text string appears in spare alarm logs and on the MAP in conjunction with the spare alarm.

Maintenance personnel may program these text string through RCUALARMS, a new table implemented by this feature. RCUALARMS allows the maintenance person to associate the text strings with specific spare alarms on specific RCUs.

Ref: DDOC AF0450

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE
Feature	RCV OFFICE PARAMETER
Feature no	F6406

FEATURE SYNOPSIS

This feature allows the maximum number of Remote Carrier DMS-1 Users (RCUs) that can exist on the p-side of a Subscriber Carrier Module (SMU) to be datafilled as an office parameter in table OFCOPT.

FEATURE DESCRIPTION

This feature limits the number of RCUs that an SMU can support based on a new office parameter. This new office parameter, `max_rcus_per_smu`, resides in table OFCOPT. This value can range from 0 to 10 per office, with a default of 10.

Ref: FDOC AF0530

Package	NTX387AA04 SMU - SUBSCRIBER MODULE URBAN
Feature set	MAINTENANCE AND TESTING
Feature	AUTOMATIC SYSTEM TEST FOR RCU
Feature no	F6573

FEATURE SYNOPSIS

This feature allows the Automatic System Test (AST) (foreground mode) to be invoked and to be aborted from the Maintenance and Administration Position (MAP). In addition, it provides the craftsman with the ability to query the RCU for the status of AST line testing.

FEATURE DESCRIPTION

There are two phases of AST. Phase I AST consists of a basis set of system verification that perform backup circuit pack exercise and switchover activities on all of the installed common equipment circuit packets only. This feature implements (in part) the second phase of AST. Phase II AST performs line testing as well as the existing capabilities of Phase I. The capabilities that are implemented by this feature require up to two hours to execute. The task is invoked either from the RCU level of the MAP or at the faceplate of the RCU, and can be aborted from the MAP at any time. The task can also be aborted from the RCU faceplate as long as it was invoked from there.

Phase II AST mode system testing is invoked by the existing TST command at the RCU level of the MAP when the AUTOTEST system options field is enabled. If the AUTOTEST system options field is disabled and the TST command is issued, only Phase I tests are run. Not only does the AUTOTEST system option field determine whether Phase II fast mode or Phase I mode will be invoked with the TST command, but it also determines whether or not the Phase II slow mode will run in the background. If the AUTOTEST field is enabled (which is the default), the background test will continuously run. Likewise, if the AUTOTEST field is disabled, no background test is run.

Ref: DDOC AF0828

Package	NTX394AA01 TOPS - CREDIT CARD DIGIT CHECK
Feature set	CALL PROCESSING
Feature	TOPS - CREDIT CARD DIGIT CHECK
Feature no	F2581

FEATURE SYNOPSIS

Currently, DMS-TOPS performs credit card digit and format checks. This feature improves the current capability by adding the following:

- a) make check digit position more flexible
- b) remove check of RAO in last four digits
- c) make digit check for datafilled NPA/RAO only (tables NPACHECK and RAOCHECK)

FEATURE DESCRIPTION

With the conversion to a 4 digit pin, which are randomly chosen, the only checking done is through inward validation (database). This feature will provide telco's with the ability to do a check digit test on cards within their own region, avoiding having to verify with the database on every call. The new algorithm will provide for having a three digit pin as well as a check digit.

There will be a field added to table CHKDIGIT (chkdgpos) that will provide the position of the check digit. The range of values accepted will be from 11 to 14, identifying one of the last four digits as the check digit (fourteen digit credit card number).

The last four digits will no longer be of the format RAO + 'D', where D is the check digit, so the test on that RAO has been removed.

The check digit test will only be run on the npa/rao's that are datafilled in tables NPACHECK/RAOCHECK respectively. It is also essential that all rao's be datafilled in table RAO, and that all npa's conform to npa format check.

There will be another change to table CHKDIGIT that will affect the range of values for the field lnchkdig as well as its name. The range will no longer be from 1 to 4 but will be from 7 to 10, and the field will now be referenced as verdgpos (verification digit position). This change will clarify which digit of the fourteen digit credit card number is used.

Package	NTX395AA01 REMOTE MAKE BUZY VIA SCAN POINT
Feature set	ADMINISTRATION
Feature	REMOTE MAKE BUSY VIA SCAN POINT
Feature no	F2565

FEATURE DESCRIPTION

This feature will allow the telco to select any outgoing or two way trunk circuit, or group of trunk circuits, and remove them from or return them to service. This is implemented by assigning a scan point to any selected circuit/circuits. Defining a normal state for that scan point, and monitoring for changes in state. If the state deviates from the specified normal state then the associated circuit/circuits are removed from service. If the state is unchanged then no action is taken.

The important aspects of this feature are

- 1) The telco must use the NT10X00AA miscellaneous scan card.
- 2) Each card is subdivided into two scan groups. The telco may choose the integer values to be assigned.
- 3) Each subgroup has seven scan points. Each point monitors the state of a switch. The telco must specify what the normal state is for that switch. (i.e. switch off or switch on).
- 4) For each scan point the telco may select any outgoing or two way trunk circuit (or group of circuits).
- 5) Identification of trunk circuits is to be done from the ttp level of the map. Any trunk circuit that is outgoing (or two way) and whose state is network management busy(NMB), should be interpreted as being removed from service via scan point action. The removal being requested by a remote office.

The telco has complete control over items listed one to four above. Item five should be used for monitor purposes only.

Use of standard commands available in the ttp level of the map will not affect the circuit removed from service by this feature.

Only trunks identified in telco data fillable tables will be acted upon. Once an entry has been added the associated scan point monitors the distant 'switch' for a change in state.

If a state change occurs then the returned value is compared with the telco defined normal value. If it deviates from the norm then the circuits

state is changed to NMB. If the circuit is engaged in another activity (i.e. maintenance testing or call processing) then its future state is changed. This allows it to complete its present action without impacting its immediate service availability.

All such circuits removed from service via scan changes will remain out of service over restarts cold and warm. After a restart the state of the circuit will show 'INI' if observed in the ttp level of the map. But it will change to 'NMB' within five minutes of the restart. This will only happen if a state change to 'NMB' had been requested before the restart.

Optionality will be achieved by data filling tables NWMSC and NWMSCPT. Changes have been implemented to support this feature. This feature uses the network management tables but is not dependent on any network management packages. However this feature is compatible with these packages.

NTX398AA10 Status: RTM SCM - 100S

MAINTENANCE AND TESTING	:	
PROGRAMMABLE POWER/MISC ALARM		F2904
SWITCHING AND TRANSLATION	:	
SCM-100S-FREQUENCY SELECTIVE RINGING		F2919
CALL PROCESSING	:	
SCM-100 OPERATOR VERIFICATION		F3478
SCM - 100S CC CALL PROCESSING		F3746
MAINTENANCE	:	
SCM - 100S CC MAINTENANCE		F3748
ADMINISTRATION	:	
RCT AND RCS INVENTORY TABLE		F3886
LINE INVENTORY FOR SLC96		F3976
MAINTENANCE	:	
SLC-96-CC PM MAINTENANCE		F5411
SWITCHING AND TRANSLATION	:	
SLC-96-CC PROTECTION SWITCHING		F5412
MAINTENANCE	:	
SLC-96-CC LINES MTCE		F5413
SWITCHING AND TRANSLATION	:	
SMS RINGING - FIRMWARE		F5415
MAINTENANCE	:	
SMS SUBSCRIBER LINE TEST - FIRMWARE		F5416
SMS MAINTENANCE - FIRMWARE		F5417
CALL PROCESSING	:	
SMS MESSAGING MODE I,III, FIRMWARE		F5418
MAINTENANCE AND TESTING	:	
SMS A/B BOARD DIAGNOSTICS FIRMWARE		F5419
SMS DS-1 BOARD DIAGNOSTICS FIRMWARE		F5420
SLC96 - DTSR FOR LINES ON A RCS		F5461
SWITCHING AND TRANSLATION	:	
SLC96 - SMS ANI AND COIN FUNCTIONS		F5462
SLC96 - SMS P-SIDE CHANNEL MANAGEMENT		F5463
SLC96 - SMS PROTECTION SWITCHING		F5464
MAINTENANCE AND TESTING	:	
SLC96 - SMC MAINTENANCE - MODE II		F5466
SCM - BOARD TO BOARD SUPPORT FOR RCS		F5532
SCM - PP SMS WARM SWACT		F5534
ALARM ENHANCEMENTS FOR SMS		F5948
SWITCHING AND TRANSLATION	:	
SMS PROTECTION SWITCH ROBUSTNESS PHASE I		F5949
MAINTENANCE AND TESTING	:	
LINE DIAGNOSTIC ENHANCEMENTS FOR SMS		F6030
SWITCHING AND TRANSLATION	:	
MERIDIAN DIGITAL CENTREX ON SMS		F6407

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	PROGRAMMABLE POWER/MISC ALARM
Feature no	F2904

FEATURE SYNOPSIS

This feature provides the ability for the Telco to datafill the name of the remote alarm scan point called PWR/MISC. Thus they may use it for things like door open.

FEATURE DESCRIPTION

The Remote Carrier SLC-96 (RSC) has associated with it a POWER/MISC alarm which may be assigned different meanings by the customer.

This feature modifies the inventory table for the RCS (RCSINV) to allow the craftsperson to assign a text string chosen by the customer to the power/miscellaneous alarm. This text string will then be used in all subsequent log reports and maintenance administration position (MAP) displays in conjunction with the power/misc alarm.

This feature has no significant impact on real time. The POWER/MISC alarm texts are written during datafill and retrieved through maintenance tasking.

Ref: DDOC AL0230

Package	NTX398AA10 SCM - 100S
Feature set	SWITCHING AND TRANSLATION
Feature	SCM-100S-FREQUENCY SELECTIVE RINGING
Feature no	F2919

FEATURE SYNOPSIS

This feature enables the use of frequency selective ringing (FSR) for multi-party lines served by an SCM-100S.

FEATURE DESCRIPTION

There are three frequency selective ringing systems commonly used: decimonic, harmonic and synchrononic. The FSR channel units have the capability to support any one of the three FSR ringing systems via an option plug on the channel unit. Therefore, the frequencies available to the parties on each line card are determined by the channel unit hardware. For this reason, specification of the frequencies for an RCS is not included in the RCSINV table.

This feature provides the following capabilities:

1. Supports the FSR channel 1 units, cardcodes SCD 222 and SCD 252, for single party, 2 party, 4 party and Meridian Digital Centrex (MDC) lines.
2. Supports SCDFSR as a valid cardcode for an RCS in the LNINV table.
3. Allows an RCS to be datafilled in the RCSINV table with ring type of FSR.
4. Allows identification of the ring code for parties of a multi-party line via service order (SERVORD).
5. Sends the proper signalling to the RCS to select the correct frequency for each party multi-party lines.
6. Provides initiation from the maintenance and administration position (MAP) of the various types of line tests for the FSR channel units, include the diagnostic tests (DIAG) and the RING test.
7. Provides the capability to run the station ringer test (SRT) from a single party FSR telephone and from any of the telephones on an FSR multi party line.
8. Provides the capability to run line tests on FSR channel units using a test desk.
9. Supports patterned ringing on single party lines connected to

FSR channel units.

Ref: DDOC AL0419

Package NTX398AA10 SCM - 100S
Feature set CALL PROCESSING
Feature SCM-100 OPERATOR VERIFICATION
Feature no F3478

FEATURE SYNOPSIS

This feature provides operator verification capability for the DMS-1 RCT when connected to a DMS-100 host.

FEATURE DESCRIPTION

The RCT provides no metallic access for bridging monitor/talk onto RCT lines. Thus in order to provide this capability a three port conference circuit is utilised.

The following restrictions apply:

- monitor/talk connection is only possible on a circuit which carries actual conversation
- monitor/talk access is not provided if there are features in progress.

The operator will receive busy or re-order tones when attempting to access an unavailable line.

The following is a list of the system actions and responses to the operator. The format will be :

Special considerations/Line characteristics

- a) ATT FSD suggested System actions and responses
- b) DMS decision

1. IDLE LINE

Normal Access Available (Voice and Voice/Data)

- a) Normal connection made, no ringing, no tone
- b) Same

Normal Access Not Available (Voice and Voice/Data)

- a) Reorder tone (120 ipm)
- b) Same

Data Only Line

- a) Verification denied, busy tone (60 ipm)

b) Same

2. BUSY LINE

Line Is Traffic Busy (Voice and Voice/Data, Simple Line)

- a) Access connection made, operator may hear conversation, quietline, reorder, busy tone, announcement, etc.
- b) Access connection made, operator hears conversation or data signals. Note: The data signals are not going to be reliable after verification, due to the use of the conference port. However, there is a line option, NO DOUBLE CONNECTION, (NDC) which will not allow testing and verification if the line is busy.

Line Up to Permanent Announcement

Line Off Hook Tone

- a) Permanent signal tone
- b) Same

Line Up To Tone Or Announcement

- a) Same as traffic busy simple line
- b) Same

Line Being Rung

- a) Same as traffic busy simple line
- b) Operator receives busy tone (60 ipm)

Line in Hunting, PBX Line Group (With an idle line in the group)

- a) Normal access connection made, no ringing, no tone
- b) Same

(All lines in the group are busy)

- a) Same as traffic busy simple line
- b) Same

Data Only Line

- a) Verification denied, busy tone (60 ipm)
- b) Same

Line with Call Waiting in Progress

- a) Same as traffic busy simple line
- b) Operator receives busy tone (60 ipm)

Line With Call Forwarding Activated

- a) Same as traffic busy simple line
- b) Same

NOTE: There are no FSD specifications for lines with any other custom calling features in progress. The DMS response will be busy tone (60 ipm).

3. LINE VERIFICATION IN PROGRESS

Line Becomes Idle During Verification

- a) No-test access connection dropped, normal access connection retained
- b) Access connection retained

Line Goes Off Hook During Verification

- a) Normal access connection retained, customer will not receive dial tone
- b) Same

Attempt to Activate Custom Calling Feature

- a) System ignores transient state while line is being verified
- b) Same

4. LINE WITH CUTOFF ON DISCONNECT (COD) OPTION

If a line has the COD option then the operator will be able to get a non-talk connection. However if the non verify party goes on hook then the call is taken down and the operator is sent busy tone (60 ipm).

Package	NTX398AA10 SCM - 100S
Feature set	CALL PROCESSING
Feature	SCM - 100S CC CALL PROCESSING
Feature no	F3746

FEATURE SYNOPSIS

This feature provides additions to the DMS-100 base data structures for the SCM-100s and implements an inventory table for the SLC-96.

FEATURE DESCRIPTION

This feature extends certain existing tables and types to support the SLC-96 as a line peripheral. (The DMS notation for the SLC-96 is RCS, being consistent with RCT for DMS-1R and RCU for DMS-1U.)

In addition, an inventory table, RCSINV, is implemented for the RCS. This table contains the following information:

- unit name
- unit location
- name of attached SMS
- ringing configuration information
- mode of operation for shelf groups
- DS-1 connectivity
- alarm control unit type

The table is designed as a clone of table RCTINV utilised for the SMR. However, two principle differences exist as follows:

1. The RCS has four line shelves configured as two shelf group pairs. Each shelf group may operate independently in one of three modes:

Mode I - non-concentrated shelfgroup--primarily intended for single and multiparty lines. There are one or two DS1 lines per shelfgroup in this mode, depending on whether one or two shelves are equipped.

Mode II - concentrated shelfgroup--the (up to) 48 lines of each shelfgroup are concentrated down to 24 channels. There is one DS1 per shelfgroup in this mode.

Mode III - non-concentrated shelfgroup--the entire shelfgroup is dedicated to coin, data lines, or other special service lines. There is one DS1 per shelfgroup in this mode.

The mode of a particular shelfgroup is dependent upon circuit packs installed in the SLC96, thus cannot be changed under

program control. The table entry for each RCS includes the mode of each of its two shelfgroups and the port number(s) on the attached SMR of the DS1 lines of the shelfgroups.

2. Alarm Control Unit

The RCS has two types of alarm control unit (ACU) circuit packs called WP1 and WP18. The difference between the two packs is the format of the alarms message sent to the office via the DDL (Derived Data Link). The RCSINV table provides an ACU field, so that alarms software will know which message template to use.

Ref: 297-2101-451 Data Schema NTP

Package	NTX398AA10 SCM - 100S
Feature set	ADMINISTRATION
Feature	LINE INVENTORY FOR SLC96
Feature no	F3976

FEATURE SYNOPSIS

This feature provides lines inventory and circuit location for the SLC-96-RCS in DMS nomenclature. Changes are made to LNINV to support the RCS structure.

FEATURE DESCRIPTION

The RCS, like the RCT will keep the LEN format fields but change the value ranges as follows:

LEN format: site, frame, unit, drawer, circuit
where site = 4 characters
frame = 0-99
unit = 0-9
drawer = 0-3
circuit = 0-23

In the DMS-100 family, line cards exist in a one to one relationship with circuit number. This means that for every line circuit number there is one and only one line card. The RCS relationship is different. RCS circuit packs contain one or two line circuits.

If the circuit pack is for coin lines, then a one to one correspondence exists between card circuit number and line circuit number. Single party and multi-party lines have a 2 to 1 relationship between line circuit and card circuit pack.

One restriction for coin lines is that their physical numbering is the odd line circuit of the pack. The second restriction is that in MODE II, coin lines are allowed to be positioned only in the 4 right most slots of each shelf.

A drawer contains 16 circuit packs. Four of these are used for common control, twelve are available for line circuits.

Line circuits are numbered 1-96 and are allocated physically to slot/shelf locations, 2 circuits per card.

Circuit Location

Although the RCS lines will follow the current len format, problems arise when trying to locate the actual physical slot of a line. RCSs use circuit packs which contain 1 or 2 lines. The circuit locate command at MAP

will be changed to accommodate the difference between logical and physical labelling of shelves and logical and physical labelling of line circuits.

To the left of the colon under SLOT, the CKTLOC display equates 0 to shelf A, 1 to shelf B, etc. The line circuit pack number which contains the line circuit being queried is to the right of the colon. Example:

```
DESCRIPTION      SLOT
RCS  00      C   02:10
```

The 02 under SLOT refers to shelf C and the 10 refers to the 10th circuit pack from the left. To make circuit location simple, the DESCRIPTION field will be changed to show the actual shelf letter if the circuit is from an RCS.

REF: FDOC BC1137

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE
Feature	SLC-96-CC PM MAINTENANCE
Feature no	F5411

FEATURE SYNOPSIS

This feature provides the CC software required to support manual maintenance of the SLC-96 remote concentration from the PM level of the MAP. The SLC-96 interfaces digitally to the DMS-100 host via the SCM-100S peripheral controller.

FEATURE DESCRIPTION

The SL-96, designated as remote concentrator SLC-96 (RCS), is integrated into the PM level MAP display. RCS is a new level which is entered by using the POST command at PM MAP level.

The following commands are available:

- TRNSL
This command displays the C-side link information for the posted RCS.
- TST
This command initiates RCS diagnostics. Results are displayed in the form of a short description and a list of suspected faulty cards.
- BS7
This command results in the posted RCS being set man-busy; calls may be affected.
- OFFL
This command is executed only if the RCS is man-busy state.
- RTS
This command causes an out of service diagnostic to be performed. Successful completion results in the unit being returned to service. A 'force' option omits the running of the diagnostic.
- QUERY PM
This command is utilised to query miscellaneous information about the posted RCS.

The RCS detects and sends alarm messages to the SMS via the derived data link (DDL). The SMS sends an unsolicited message to the CC in response as follows:

- a MAJOR alarm indicates that a failure has occurred which caused

loss of service to subscribers served by a shelf or shelf group. If there is no accompanying shelf alarm the RCS node becomes system busy. If there is a shelf alarm the node is marked in-service trouble (ISTB). A CC audit attempts to RTS a system busy node every 10 minutes.

- a MINOR alarm is non-service affecting and will cause the node to be marked ISTb.
- a POWER/MISC alarm is a power and optional alarm and will result in status ISTb.
- a SHELF ALARM indicates failure of the reported shelf. It is accompanied by a MAJOR or MINOR alarm.

The SCM-100s autonomously runs tests and reports on failure to the CC:

- the messaging integrity of the DDL is checked
- the PCM paths are exercised
- a "no alarm" is received from the RCS each 1.15 seconds.

Reference

FDOC BC1140

Package NTX398AA10 SCM - 100S
Feature set SWITCHING AND TRANSLATION
Feature SLC-96-CC PROTECTION SWITCHING
Feature no F5412

FEATURE SYNOPSIS

This feature provides CC software in support of the protection line capability of the SLC-96 remote concentrator (RCS) when interfaced digitally to DMS-100 via the SCM-100s peripheral controller.

FEATURE DESCRIPTION

The RCS interfaces to the SCM-100s by means of up to four normal DS-1 lines. The DS-1 lines are associated with the shelves of the RCS and may be configured to provide a concentrating or non-concentrating host interface. A protection line is a standby DS-1 link between the RCS and SMS that may be switched in to replace a detected fault on a normal link.

A protection line is dedicated to one RCS. A protection switch preserves calls in all states other than digit collection. A protection line is treated as a normal p-side port with no RCS attached. Manual control of protection switching is available at the CARRIER level of the MAP.

For purpose of protection, the normal lines are prioritised with the A-link given preference over the B, C, D. (A carries the DDL.) A protection switch is initiated from the SMS or the RCS upon detection of line failure resulting in signal loss or excessive bipolar violations.

Manual protection switch control is available at the CARRIER level of the MAP via the menu command PROTSW. Capability is provided to:

- enable and disable protection of a normal line
- initiate protection switch of a normal line
- release protection of a normal line.

Reference

BC1427

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE
Feature	SLC-96-CC LINES MTCE
Feature no	F5413

FEATURE SYNOPSIS

This feature integrates line maintenance capability of the SLC-96 RCS with the DMS-100 LTP, ALT and MAP capabilities. The RCS interfaces digitally to the DMS-100 via DS-1 lines and the SCM-100s peripheral controller.

FEATURE DESCRIPTION

Capability is provided to control the metallic test access to RCS lines, to attach various passive terminations to the line card and to invoke line diagnostics. The SMS messages to the RCS utilising the DDL M-field.

Line diagnostics supported are:

- channel loss
- noise test
- echo return loss
- loop detector test
- ani and coin presence test
- ringing test
- coin collect, coin return tests.

The RCS line cards have a single relay for disconnection of the loop and connection to the MTA. As a result the following changes are made at the MAP LTP level applicable to RCS line maintenance:

- 1) TstRng is not permitted because the line cannot be ring with test equipment connected simultaneously. This requires a bridged connection.
- 2) LCO is not permitted because the subscriber loop cannot cut off.
- 3) BalNet does not apply to RCS lines since there is no programmable balance network in the RCS line circuit.
- 4) Monitor and Talk connections will be done via PCM. These commands will be limited to lines in idle state.
- 5) Command Orig is not permitted in RCS lines because it requires a bridged connection.
- 6) The only valid option in command LTA is RLS. This option is used to release the monitor or talk connections.
- 7) The command NextD will post the next RCS shelf.

PCM connections are required to set up monitor/talk connection as the RCS lines cannot be bridged. This capability is common to the RCT and RCS.

Reference

BC1428

Package	NTX398AA10 SCM - 100S
Feature set	SWITCHING AND TRANSLATION
Feature	SMS RINGING - FIRMWARE
Feature no	F5415

FEATURE SYNOPSIS

This feature provides the SMS software to control the ringing operators in the SLC-96. The SMS utilises the A/B bit signalling to provide ringing.

FEATURE DESCRIPTION

The SMS ringing function supports all available ringing schemes (coded, superimposed frequency selective), single and multiple party lines. The capability supports multiple ringing schemes on a single RCS and multiple RCSs on an SMS.

The RCS has two ringing generators - one is active while the other provides a standby utilised in fault conditions. The ringing is applied to a channel unit by alternating the A/B bit signalling between ring and idle patterns.

For coded schemes the A/B signalling contains information indicating how ringing is to be applied.

The SMS ringing control is implemented in the SMS master processor and communicates with the A/B bit facility in the signalling processor.

Reference

BP0510

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE
Feature	SMS SUBSCRIBER LINE TEST - FIRMWARE
Feature no	F5416

FEATURE SYNOPSIS

SCM-100s capability is provided to interface to the CC and to the SL-96 for purpose of metallic line test access.

FEATURE DESCRIPTION

This feature connects the RCS to the metallic test access (MTA) system under the control of the CC. There are four line card terminations that may be set up when the cut off relay is activated.

- a 900 SL resistance across the tip and ring
- a short across the tip and ring
- a 900 SL resistance across tip and ring with the tip grounded
- a short across tip and ring with tip grounded

These terminations are utilized to undertake the line diagnostics detailed in F5413.

Facilities are provided for the CC to request the following:

- connect RCS to metallic test pan
- disconnect RCS from metallic test pan
- set termination type
- remove termination.

Reference

BF0511

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE
Feature	SMS MAINTENANCE - FIRMWARE
Feature no	F5417

FEATURE SYNOPSIS

This feature provides maintenance facilities for the SCM-1005 and the SLC-96 remote concentrator. SMS maintenance is responsible for:

- fielding and servicing SMS related maintenance requests from the CC
- controlling fault detection, recovery processing of the SMS and the RCSs.

FEATURE DESCRIPTION

Maintenance is performed on four major areas of the system:

- maintenance of the SMS node itself
- maintenance of the p-side links serving the remote concentrators
- maintenance of the RCSs
- maintenance of the RCS lines

SMS node maintenance is an extension of the existing LTC facilities. CC commands are unchanged from the LTC however, MBSY is extended to prepare the A/B signalling and for diagnostics and RTS processing handles the initialisation of the static data and activation of messaging.

P-side link maintenance is also extended for port open/close requests as follows:

- external A/B bit signalling is enabled/disabled for all DS-1 channels on the link
- for open requests, a DDL looping test is executed if the link is a DDL link
- for open requests, a speech path continuity test is executed by utilizing the far end loopback capability of the RT
- dynamic tables such as the DDL status table and the p-side port table must be updated to reflect the port change.

The RCS node maintenance interface supports the MAP PM commands, BSY, RTS, TEST, QUERY. SMS processing in response to these commands implements the housekeeping. Message passing and procedure algorithms required by the SLC-96.

In addition, the protection switching, alarm monitoring and operational measurement functions are included.

Reference

BF0513

Package	NTX398AA10 SCM - 100S
Feature set	CALL PROCESSING
Feature	SMS MESSAGING MODE I,III, FIRMWARE
Feature no	F5418

FEATURE SYNOPSIS

This feature provides SMS peripheral software responsible for the messaging and signalling interface to the SLC-96 RCS and provides the call control utilities for RCS modes I and III.

FEATURE DESCRIPTION

The SLC-96 RCS operates in three modes:

- in mode I each shelf group multiplexes 48 telephone lines onto two DS-1
- in mode II each shelf group concentrates 48 telephone lines onto one DS-1
- in mode III each shelf group multiplexes 24 lines onto one DS-1

Thus in modes I, III the SMS/RCS is non-concentrating and has different call control software from mode II. Essentially, modes I, III have fixed p-side channel assignments utilized for line monitoring and control whereas mode III assigns/de-assigns channels as required.

Call control and messaging software is resident in the master processor and signalling processor.

The MP processing is based upon the software utilized for terminal call processing in the LTC for LCMs. This implements the primitives for line control, testing and the ANI/COIN functions. The software communicates with the A/B bit and DDL facilities in the SP, and with the MP resident ringing task.

Messaging and channel signalling between the SMS and the RCS utilize the derived data link (DDL) and A/B bits respectively.

The A/B signalling channels provide a per channel signalling capability by normal bit stealing. A/B facility processing is handled by the SP, it controls the sending of signalling information and the reception and filtering of supervision from the lines. The A/B bits are controlled at the physical level by the A/B DDL circuit pack.

The DDL carries control and alarm information between the SMS and the RCS. It is implemented by borrowing signalling framing bits from the marker frame. The DDL is logically divided into four fields utilized to communicate data:

- a concentrator field is utilized in mode II to communicate channel assignment and deassignment messages
- a maintenance field carries channel and loop testing information
- an alarm field carries alarm information and system control commands
- a line switch field carries protection switching information

The DDS is driven physically by the A/B DDL circuit pack and logically by the SP.

Reference:

BF0515, BF0524, BF0516

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	SMS A/B BOARD DIAGNOSTICS FIRMWARE
Feature no	F5419

FEATURE SYNOPSIS

This feature provides the diagnostic routines for the A/B bit and DDL circuit (6X86) pack utilized in the SCM-1005.

FEATURE DESCRIPTION

The A/B DDL board consists of an 8085 processor, memory, control and timing circuitry. Diagnostics are provided to test.

- sanity self check
- ROM verification by check sum
- RAM tests; limited in service shared memory by SP, out of service destructive tests
- control, message loopback tests
- SMS timeswitch loop around tests.

Diagnostics are invoked directly by command from the CC, at power up and following a card reset.

Reference - BF0520

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	SMS DS-1 BOARD DIAGNOSTICS FIRMWARE
Feature no	F5420

FEATURE DESCRIPTION

This feature provides board level diagnostics for the DS-1 DDL circuit pack used in the SCM-1005 peripheral controller. The DS DDL circuit pack provides circuitry for interfacing DS-30 c-side ports to the DS-1 p-side links to the RCS. The card also provides the circuits for displacement of signalling frame links and recognizes data carried on the data link.

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	SLC96 - DTSR FOR LINES ON A RCS
Feature no	F5461

FEATURE SYNOPSIS

This feature provides Dial Tone Speed Recording (DTSR) OMs and extensions to peripheral DMS for the SCM-1005 and the SLC-96 RCS.

FEATURE DESCRIPTION

A new OM group, SITE2, is introduced to extend the traffic related OMs and DTSR registers for remote sites. The SITE2 group contains primary and overflow peg count registers for total DP and MF originations. Registers are also designated to hold peg counts of MF and DP originations that experience a dial tone delay of greater than 3 seconds.

Dial tone delay measurement is achieved in SMS call processing and the DTSR tables are maintained in the SMS. A CC process is used to poll the DTSR tuples in the peripherals and to update the SITE2 OM tables in the CC.

The OMGROUP PM2 is extended to cover the SMS and the RCS. Key field for these peripherals are SMSOM and RCSOM.

The following counts are kept for the RCS node:

PMERR, PM2FLT, PM2MSBU, PM2MMBU, PM2CCTFL, PM2CCTSB, PMCCTMB.

All PM2 registers are maintained for the RCS.

References

NTP 297-1001-114

BC1139

Package	NTX398AA10 SCM - 100S
Feature set	SWITCHING AND TRANSLATION
Feature	SLC96 - SMS ANI AND COIN FUNCTIONS
Feature no	F5462

FEATURE SYNOPSIS

This feature provides the peripheral software in the SMS that implements ANI and coin functions for the SLC-96 RCS.

FEATURE DESCRIPTION

The ANI and coin functions in the RCS are involved by manipulation of the A/B bit signalling.

Coin commands include scanning for off hook on CDF and CCF lines, coin presence and local call overtime coin presence commands are also provided to collect and return coins.

ANI is utilized to distinguish between the tip and ring parties on multi-party superimposed ringing channel units for purpose of billing. The RCS returns AB bit patterns which reflect the tip ring line status.

The ANI coin functions are implemented in LTC common code, SMS peripheral software and utilize the SMS A/B bit facility and CC primitives.

Reference - BF0517

Package	NTX398AA10 SCM - 100S
Feature set	SWITCHING AND TRANSLATION
Feature	SLC96 - SMS PROTECTION SWITCHING
Feature no	F5464

FEATURE SYNOPSIS

This feature provides SCM-100S code to implement a protection line switch in the SMS. A protection line switch from a normal DS-1 link to a protection link is initiated by the RCS, the SMS or via CC maintenance.

FEATURE DESCRIPTION

A protection line is a standard DS-1 link (as far as the SMS is concerned) generated in a standby mode. An RCS is equipped with two to four normal links and one optional protection link. The protection link may be switched to replace a normal link following failure or a manual maintenance action. All calls except those in digit collection are preserved over the switch.

The RCS or SMS will initiate a protection switch upon detection of a link failure. The SMS will initiate a switch on detection of one of four types of failure:

- . line carrier group alarm
- . remote carrier group alarm
- . signal loss
- . excessive bipolar violations

A reswitch is controlled by the unit which initiated the switch when the fault is cleared.

Ref: BF0521

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	SCM - BOARD TO BOARD SUPPORT FOR RCS
Feature no	F5532

FEATURE SYNOPSIS

This feature supports automatic board to board testing required to cutover a SLC-96 (RCS) remote concentrator to a DMS-100.

FEATURE DESCRIPTION

The capability to test RCS lines during ABBT is required. In this scenario the RCS will be controlled by a central office terminal (COT) at the original CO (which is being replaced by the DMS).

The DS-1 lines between the COT and the RCS are bridged and connected to the SCM-100S. In this way the SCM-100S is able to monitor the A/B bit signalling between the COT and the RCS. The DMS interfaces to the old office via a NT5X73 ABBT test unit. The DMS initiates a RCS line test by outpulsing the ON of the line to the old office via the test unit. The ABBT test is completed by scanning the A/B signalling for the channel test code on the appropriate DS-1 span. An ABBT failure is recorded if a timer expires before the SCM-100S reports detection of the code.

This feature provides changes in the CC ABBT software to implement the RCS specific ABBT procedure. Software is also provided for the SCM-100S to complete the scanning and reporting of ABBT to the CC.

The ABBT CC software gives the SMS an identifier of the line on the RCS being tested along with the command to start scanning. It then through the ABBT test unit (NT5X73) causes the COT to request a 'Channel Test' on this line of the RCS. This line will be the one whose DN was previously picked from the ABBT DN test range by the ABBT process and then outpulsed to the old office from the new DMS over a test trunk.

The SMS will use the identifier just received to determine what channel on what link to scan for the 'Channel Test' test pattern. The SMS notifies ABBT software as to whether or not the test pattern was seen. If seen, ABBT software translates this as the line passed the ABBT and if not seen then the line failed the ABBT.

This sequence of events continues for each DN until all the DNs in the test range specified when ABBT was initiated have been tested.

Note that the NT5X73 ABBT test unit is modified for use with RCS installations.

Ref: BC1387, BF0573

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	SCM - PP SMS WARM SWACT
Feature no	F5534

FEATURE SYNOPSIS

This feature provides SCM-100S software to support peripheral warm SWACT. SMS specific SWACT capability is based upon the XPM controller (LGC, LTC, DTC) facility.

FEATURE DESCRIPTION

Peripheral SWACT capability is based upon the ability to maintain dynamic data in the inactive controller. For this purpose a data link is provided between the two signalling processors over which dynamic critical data is transferred between the active and inactive controllers.

The following dynamic data are sent to the inactive unit on an ongoing basis as data in the active unit change.

1. Call data - when a call is established or disconnected.
2. Terminal states - when a terminal is put into or taken out of service.
3. Port status - when a PP/CC-side port change (open/close) is requested.
4. DS1 maintenance - when maintenance or data synchronization reporting is enabled/disabled (see definitions section for explanation of DS1).
5. Pside node status - when a PP-side node, i.e., remote terminal (RT), is busied or returned to service.
6. Protection switching - when protection switching is enabled/ disabled and when it is switched/unswitched.
7. Nailed-up connection - when a PP-side to PP-side connection for special service is established or taken down.

SCM-100 specific SWACT capability is associated with protection switching and 'nailed-up' special services.

Ref: BF0574

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	ALARM ENHANCEMENTS FOR SMS
Feature no	F5948

FEATURE SYNOPSIS

This feature improves the methods used by SCM alarm software to screen and report to the CCC alarms originating from the RCS. Furthermore, it enhances the usefulness of the MMI output for these alarms by including the reasons for their occurrence.

FEATURE DESCRIPTION

Methods used to check and filter alarm indications originating from the RCS are improved to stabilize response to fluctuating and unstable alarm inputs and to reduce the possibility of sending conflicting output to the CC in the presence of changing alarm conditions.

Alarm information presented at the MAP in response to a query PM FLT command for a posted RCS operating in an in service with faule (ISTB) state will now include the reasons for each alarm listed in order of importance.

Similarly, the log message reporting RCS state change (log PM-128) is modified to include the alarm causing the change and its reason. Where multiple alarms are generated or multiple reasons exist only the most important of each is logged. This log will now be generated when alarms are ungraded from minor to major.

Ref: AF0058

Package	NTX398AA10 SCM - 100S
Feature set	SWITCHING AND TRANSLATION
Feature	SMS PROTECTION SWITCH ROBUSTNESS PHASE I
Feature no	F5949

FEATURE SYNOPSIS

This feature is actually an enhancement to the subscriber module SLC 96 (SMS) protection switching software. Protection switching reliability is improved as a result of the enhancement.

FEATURE DESCRIPTION

There is one change in SMS protection switching functionality: the SMS now emulates COT (central office terminal) protection switching protocol when T1 line faults are detected by one end (either the SMS or SLC 96) and a T1 line fault already exists at the opposite end. If a fault is detected at one end and no other faults exist at that end and a fault already exists at the opposite end, then the protection line will be switched to the lowest lettered ("A" being the lowest) SLC 96 shelf corresponding to the 4 lowest lettered T1 line with a fault.

Ref: DDOC AF0059

Package	NTX398AA10 SCM - 100S
Feature set	MAINTENANCE AND TESTING
Feature	LINE DIAGNOSTIC ENHANCEMENTS FOR SMS
Feature no	F6030

FEATURE SYNOPSIS

This feature enhances line diagnostics and other lines maintenance tests on SMS/RCS (subscriber module SLC-96/Remote Carrier SLC-96). These enhancements provide a more comprehensive test set for line diagnostics. The run time of the affected tests is decreased. Line features are reported with more descriptive messages. This feature in no way alters the method craftspersons use to implement line diagnostics and tests.

FEATURE DESCRIPTION

The feature changes three areas of line diagnostics and tests which permit a craftsperson to verify the functionality of a subscriber line:

- four levels of the maintenance and administration position (MAP)
- the subscriber's premises
- a test desk

For the MAP levels and tests, this feature only improves on LTP (line test position), LTPLTA (line test position line test access) and ALT (automatic line test) three levels. The level LTPMAN (line test position manual) is not affected.

As far as subscriber premises tests is concerned, dialable short circuit and station ringer are two tests that can be invoked from the subscriber's telephone set. This feature detects failures that were undetectable before. The method to invoke the tests, however, remains the same.

Finally, the software implementation for test desk tests are enhanced:

- # 14 local test desk (LTD)
- # 3 test cabinet (LTC)
- mechanized loop testing system (MLT)
- centralized automatic loop reporting system (CALRS)

Ref: DDOC AF0157, AF0158

Package	NTX398AA10 SCM - 100S
Feature set	SWITCHING AND TRANSLATION
Feature	MERIDIAN DIGITAL CENTREX ON SMS
Feature no	F6407

FEATURE SYNOPSIS

This feature provides Integrated Business Network (IBN) features on the Remote Concentrator SLC-96 (RCS). Since the Subscriber Module SLC-96 (SMS) does not support trunks, features involving trunks require that they terminate on equipment other than SMS. Also, station features are limited to 500/2500 sets and attendant consoles, since SMS does not support Electronic Business Sets (EBS) or data units.

FEATURE DESCRIPTION

The feature set provided includes the following packages:

- Basic IBN (attendant console, system and station features)
- IBN Enhanced Business Service
- IBN Station Message Detail Recording (SMDR and Enhanced SMDR)
- IBN/ESN trunk queuing
- IBN Hospital Communications - station features
- IBN Large Conference Features
- IBN Virtual Facility Groups
- IBN Dynamic Attendant Console Measurements
- IBN Message Service
- IBN Multi-Bilingual Console
- Equal Access End Office
- IBN Preset Conference
- IBN Priority Console Alerting
- IBN ESB Compatibility
- Dynamic Attendant Console
- IBN Voice Messaging - VMX
- Customer Station Change
- IBN Enhanced Call Forwarding
- IBN Secretarial Call Park
- IBN Service Analysis
- IBN End User Testing of Trunks
- Basic ESN
- IBN Cut-Through Dialing
- IBN/ESN Network Speed Calling
- Time of Day Routing
- Time of Day Network Class of Service (NCOS) Routing
- IBN Superset
- IBN Enhanced Dial Plan
- Random Conditional Routing

A more detailed breakdown of features provided is given in FDOC ref AF0237.

The distinctive ringing feature requires that the RCS be configured with coded ringing.

Ref: FDOC AF0237

Package	NTX399AA01 IBN/ESB COMPATIBILITY
Feature set	ENHANCEMENTS
Feature	IBN AND ESB COMPATIBILITY
Feature no	F3448

FEATURE DESCRIPTION

The Emergency Service Bureau (ESB) allows a subscriber to report an emergency to a centralized bureau by dialling 911.

This feature allows IBN and ESB to be compatible so that IBN subscribers can take full advantage of the services it provides.

An IBN subscriber may dial 911, 9911 or another number to reach the ESB. This feature will allow the following types of calls to occur:

IBN line calls to the ESB where the ESB is a line
IBN line calls to the ESB where the ESB is a trunk
IBN trunk calls to an ESB line
IBN trunk calls to an ESB trunk
Attendant console calls to an ESB line
Attendant console calls to an ESB trunk
Console extension of IBN and POTS lines to an ESB line
Console extension of IBN and POTS lines to an ESB trunk
Console extension of IBN and POTS trunks to an ESB line
Console extension of IBN and POTS trunks to an ESB trunk
Console extension of ESB to IBN, POTS lines and trunks
ESB calls to the console which are extended
Three way calls involving the ESB - ESB and two IBN parties

- ESB, POTS station and an IBN station -
many othe combinations
Attendant console calls extending calls to the ESB
from a multiport IBN call

NOTE: ESB lines and trunks are always POTS lines and trunks. IBN
ESB lines and trunks are not supported.

NTX407AB01 Status: RTM ACD - CALL PROCESSING (UPGR. OF NTX407AA)

ACD CALL PROCESSING	:	
CALL SOURCE ID		F1839
ACD MUSIC ON DELAY		F3458
ACD NOT READY KEY		F3922
ACD INCALLS KEY		F3923
ATTENDANT CONSOLE TO ACD		F3930
ACD DIRECTORY NUMBERS		F3938
ACD BASE UTILITIES		F5435
ACD ENHANCED	:	
3WC/CALL TRANSFER TO ACD		F5957
ACD CALL PROCESSING	:	
INCOMING CALL PRIORITY		F5963
INCOMING CALL QUEUE		F5964
CALL DELAY ANNOUNCEMENT		F5965
NIGHT TREATMENT		F5966
AUTOMATIC OVERFLOW		F5967
INCOMING CALL QUEUE		F5968
AGENT QUEUE		F5969
ABANDONED CALL CLEARING		F5970
CONFERENCING	:	
3WC TO CHAINING TO ACD INTERACTION		F6492
SECURITY	:	
ACD AGENT LOGIN ENHANCEMENT		F6493

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	CALL SOURCE ID
Feature no	F1839

FEATURE SYNOPSIS

The P-phone with display is a standard p-phone with a 32 character alphanumeric liquid crystal display (LCD). This display will aid the user by providing enhanced visual feedback during the originating, terminating, programming and feature activating operations of the p-phone. This feature deals with the display of incoming call information.

FEATURE DESCRIPTION

When an incoming call arrives at the primary directory number (PDN) of a DISPLAY-SET, and the DISPLAY-SET is idle, (no active DNs and not in a programming or digit collection state), the incoming call's information will be auto-displayed on the upper line of the 2 line display. If the DISPLAY-SET is not idle but the PDN is, the incoming call information will not be displayed. As soon as the set goes idle the PDN's call will be displayed.

Calls arriving at a Secondary directory number (SDN) will only have the corresponding information displayed when the call is answered or through the use of the DISPLAY KEY (ie no auto-display).

The information displayed will vary depending on the type of originator of the incoming call.

- 1) For calls from within the same customer group the digits displayed will be the caller's extension.

For calls from outside this customer group but from within the same switch the default message for information unavailable will be displayed (ie "33333333 "). This is assuming that the inter-customer group display office parm is not set. If this office parm is set then the seven digits of the calling party's DN are displayed unless extension form inter group dialing is used. If this is the case then again just the caller's extension is shown. Incoming POTS calls are never displayed.

For calls that have been forwarded from within the same customer group without going through trunks, the originator's DN will be displayed and not the last leg's.

- 2) For calls arriving from trunks of the same customer group, the abbreviated Common Language Name (short CLLI) (6 characters) of the trunk group will be displayed. Again if the inter_group

office parm is set then outside IBN trunk CLLIs will also be displayed. It is the responsibility of the customer (telco) to associate meaningful short CLLIs with trunk groups (table CLLIMTCE).

- 3) For calls arriving from attendant consoles from within the same customer group or if the office parm is set, the last 8 characters of the CLLI for that attendant will be displayed. Again it is the customer's responsibility to make the CLLIs unique and meaningful. For calls extended by the attendant to the DISPLAY SET, the source or other party and not the attendant will be displayed.

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	ACD NOT READY KEY
Feature no	F3922

FEATURE SYNOPSIS

The ACDNR feature provides one of the means by which an ACD agent inhibits the ACD positions INCALLS key from receiving ACD calls or by which the agent can release an answered ACD call. This feature is normally used when an ACD agent needs time between calls to finish a transaction.

FEATURE DESCRIPTION

The automatic call distribution not ready (ACDNR) feature assigned to an ACD position forms part of the SL-100 automatic call distribution package. While active, the ACDNR feature marks the ACD position's INCALLS key temporarily unavailable to receive ACD calls.

The ACDNR feature imposes no restrictions on any of the secondary directory numbers on an ACD position. While the ACDNR feature is active calls can be originated or terminated on any of the ACD position's secondary directory numbers.

This feature is activated or deactivated by depression of the ACDNR key. The ACDNR lamp is turned on or off to represent the state of the feature. ACDNR lamp on represents the feature's active state, while ACDNR lamp off represents the inactive state.

Reference: FDOC BC1118

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	ACD INCALLS KEY
Feature no	F3923

FEATURE SYNOPSIS

The incoming calls (incalls) key provides basic ACD call handling capability to an ACD position. This feature provides the proper interactions between the ACD incalls key and existing IBN features. The incoming calls key (incalls) is assigned to key number one on an electronic telephone set, provides basic ACD call handling capabilities.

FEATURE DESCRIPTION

An ACD position is an electronic telephone set equipped with an incalls key as key number one. The incalls key replaces the primary directory number on an ACD position. This key is used by ACD agents to answer incoming ACD calls only. The ACD position can have secondary DNs used to answer non-ACD calls or to originate calls. However, a call answered or originated on a non-ACD DN does not affect the availability of the ACD agent, that is the agent is not removed from the queue of available agents. The incalls key of the ACD position cannot be used to originate calls.

When an ACD position is selected to receive an ACD call, the call is presented through the incalls key. The incalls key lamp flashes and the warble tone is given if the set is onhook and not talking on a secondary DN, otherwise buzz tone will be generated at the set. The incoming call information will be automatically displayed.

Reference: FDOC BC1119

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	ATTENDANT CONSOLE TO ACD
Feature no	F3930

FEATURE SYNOPSIS

This feature will allow an attendant console to originate or extend calls to automatic call distribution (ACD) directory numbers.

FEATURE DESCRIPTION

The attendant console can originate to an ACD DN. This is transparent to the attendant except for the fact that the attendant cannot exclude the ACD call with an EXCLUDE SOURCE key hit until the call has been answered.

Extending a call to an ACD directory number can be done in the same manner as extending a call to an IBN or POTS line. A call extended to an ACD DN may be in one of two call phases - 1) queued and still connected to the console, 2) terminated upon an ACD agent and ringing the agent's phone while still connected to the console.

Reference: BDOC BC1324

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	ACD DIRECTORY NUMBERS
Feature no	F3938

FEATURE SYNOPSIS

The purpose of this feature is to provide all the table control and data structures necessary to allow DMS-100 business sets to act as ACD answering positions.

ACD on SL-100 is an extension of the Universal call distribution (UCD) capabilities originally introduced in software release BCS 14 under feature BC0952, FDOC BC0952 provides background information which the reader may find useful in understanding this document.

ACD will be implemented completely separately from UCD. There will be no dependence on UCD software modules or datafill. This permits ACD to be packaged separately from UCD.

FEATURE DESCRIPTION

Automatic call distribution (ACD) provides an equal distribution of calls to a predesignated set of answering positions also known as ACD agent positions.

ACD is typically used in service industries where it is desirable to have a large number of answering positions available to answer a large number of incoming calls. If all agents are busy, calls are queued in order of their arrival. As soon as an idle agent becomes available, the agent is presented with the first waiting call. Within each ACD group, each incoming call is offered to the agent who has been idle for the longest period of time. This ensures a fair distribution of calls amongst the agents.

ACD will be offered via special purpose keys on DMS-100 business sets. The primary special key for ACD is the INCALLS key, through which incoming calls are answered.

An ACD agent position is a DMS-100 business set which has an incalls key as key #1. When used for other purposes, a DMS-100 has a directory number appearance as key #1. The incalls key will be available only for use as key #1. therefore, a DMS-100 business set can have at most one incalls key. The key will be available through table control and service orders. The action of assigning the incalls key to a DMS-100 business set designates that set as an ACD agent position.

There is no action which must be performed by the ACD agent in order to associate an ACD agent position with its ACD group. The linkage between the agent set and its ACD group is determined directly from datafill.

The existing make set busy (MSB) feature will be modified so that a MSB state removes the set from the pool of available agent positions. Activation of MSB also renders the set unavailable to receive incoming calls of any sort, including ACD calls.

ACD agent positions must be equipped with a MSB key so that the position can be disabled when it is unmanned.

ACD is structured on the basis of ACD groups. ACD agents and directory numbers are assigned to ACD groups. Each group receives calls from up to 17 directory numbers and distributes calls to the ACD agents assigned to the group.

Associated with each ACD group are:

- . ACD agent positions (DMS-100 business sets with incalls keys). These agent positions form a pool of sets to which incoming ACD calls will be distributed.

- . Up to 17 ACD DNs. Calls placed to these DNs will be distributed amongst the agents available to answer ACD calls within the ACD group.

- . A set of call queues. Calls are placed into the queue when no agent is available to answer an incoming call. Calls are removed from the queue as agents become available to handle them.

- . Operational measurements.

- . Datafill defining the attributes of the ACD group.

- . A queue of idle agents, ordered so that the agent who has been idle for the longest period of time is at the front of the queue.

ACD groups are completely independent of one another.

The linkage between ACD DNs and the ACD agent positions which serve those ACD DNs is indirect. It is implied by virtue of the DNs and the agent positions being associated with the same ACD group.

ACD groups cannot overlap; an agent must be assigned to a single group. A maximum of 256 ACD groups can be datafilled.

DMS-100 business sets can be configured to perform supervisory functions within ACD groups. Supervisory functions are performed using special keys, which allow the supervisor to:

- . call agents.

- . monitor the workload of the agents,

- . observe (ie, listen to) calls as they are handled by agents,
- . respond to requests for information or assistance from agents, an
- . assist agents with emergency situations, eg, abusive callers, bomb threats, etc.

The agent positions are equipped with special keys which allow agents to:

- . call their supervisor for information or assistance, and
- . call their supervisor in an emergency situation. (The emergency function has additional side effects, such as causing the call to be tape recorded.)

DMS-100 business sets having special keys for supervisory functions need not be configured as ACD agent positions, although keys for supervisory functions can be assigned to agent positions, although keys for supervisory functions can be assigned to agent positions if desired. This flexibility permits the customer either to assign supervisory roles to designated agent positions, or to provide separate personnel for supervisory roles, as appropriate to the application.

SL-100 ACD requires knowledge of the relationship between specific agent positions and their supervisors in order to direct agents' requests to the correct supervisor etc.

To provide this linkage, we introduce the concept of a subgroup. Each ACD group contains one or more subgroups. These groups are identified by integers starting at zero:

. subgroup number zero has special meaning: it is a "nil" subgroup that does not actually exist. Subgroup 0 is never datafilled in the ACD subgroup table. The customer may specify the value 0 for subgroup number in applications where the subgroup facility is not desired.

Reference: FDOC BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	ACD BASE UTILITIES
Feature no	F5435

FEATURE SYNOPSIS

Automatic call distribution permits calls in SL-100, IBN and DMS-100 military systems to be evenly distributed to a number of pre-designated electronic telephone sets (DMS business sets). If all these stations are busy, new calls are queued and ringing tone is returned to the caller. This feature provides the base utilities for the ACD feature and modifies the (MSB) make set busy feature so that a "Make set busy" state removes the set from the pool of available agent positions. This feature is a part of F3938 (ACD data structure and table control).

References: FDOC BC1522, BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD ENHANCED
Feature	3WC/CALL TRANSFER TO ACD
Feature no	F5957

FEATURE SYNOPSIS

This feature handles all interactions between New Three Way Calling (3WC)/call transfer and ACD, so that a party involved in a 3WC or a 3WC chain can dial an ACD DN.

FEATURE DESCRIPTION

This feature will allow a party involved in a 3WC to flash (or press the 3WC key) and dial an ACD DN. The call will be presented to the ACD group, and progress in a manner consistent with regular ACD calls. The fact that this is an ACD call will be transparent to the party who initiated the 3WC because options such as call transfer and 3WC chaining are available to the controlling and non-controlling parties.

To use this feature, the New Three Way Calling feature must be in the customer load. ACD will continue to block calls from attendant consoles where the source on a console is involved in a 3WC. Further, the observe agent feature cannot be used to observe an ACD agent involved in a 3WC.

Ref: DDOC BC1569

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	INCOMING CALL PRIORITY
Feature no	F5963

FEATURE SYNOPSIS

The customer can choose to have low priority calls promoted to the next higher priority level after a timeout period.

FEATURE DESCRIPTION

High priority calls are always answered before calls of a lower priority. It is therefore possible for calls in the lower priority queues to remain unanswered for indefinite periods of time. The ACD system provides a means of avoiding such delays. The ACD customer can specify a priority promotion interval, datafilled for each ACD group. Low priority calls would then be promoted to the next higher priority after the expiration of the datafilled time interval.

Ref:

FDOC BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	INCOMING CALL QUEUE
Feature no	F5964

FEATURE SYNOPSIS

Calls terminating on an ACD DN are placed in the order of their arrival into one of the call queues belonging to the ACD group which owns the particular DN.

FEATURE DESCRIPTION

Each ACD group has four incoming call queues. Each queue is given a different priority, 0 to 3. For each ACD group, the customer may define a maximum number of calls that can be queued in the groups incoming call queue at any instant (i.e., the maximum call queue size). For each ACD group, the customer may define the maximum length of time a call should have to wait before being answered. Calls may be routed to other ACD DNs or destinations as datafilled if either queue size or answer time is exceeded.

Ref:

FDOC BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	CALL DELAY ANNOUNCEMENT
Feature no	F5965

FEATURE SYNOPSIS

When there are more incoming calls than agents available to serve them, a recorded announcement advising of the delay in answering may be provided.

FEATURE DESCRIPTION

There is a delay threshold which is a customer option for each ACD group. As the number of incoming calls exceed the number of available agents, the answer delay will increase. Informing callers of a delay is a method of abating caller abandonment of incoming calls. Recorded announcement is given to callers who experience delays exceeding a threshold which may be set to 0 or 6 to 60 seconds.

If an agent becomes available during the recorded announcement, the call will be disconnected from the announcement and routed to the agent. At the end of the announcement, calls not answered by an agent are placed on silent hold or given music until answered.

The delay announcement can be provided by the DRAM (digital recorded announcement machine) or an analog announcement machine as may be provided in the office.

Ref:

FDOC BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	NIGHT TREATMENT
Feature no	F5966

FEATURE SYNOPSIS

This feature provides a night service mode when all agents in an ACD group activate make set busy keys on their business sets.

FEATURE DESCRIPTION

This feature provides one of the means of placing an ACD group into night service. The other method (supervisor control of night service) allows the supervisor to be equipped with one night service key for each ACD group. When night service is activated new calls are rerouted as specified in table ACDGRP while call already in the incoming call queue will remain until abandoned.

References:

FDOC BC1116
FDOC BC1010

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	AUTOMATIC OVERFLOW
Feature no	F5967

FEATURE SYNOPSIS

Incoming aCD calls may be rerouted under conditions of call queue overflow. Such rerouting can direct calls to other destinations within as well as outside the switch.

FEATURE DESCRIPTION

Calls terminating on an ACD on are placed in the order of their arrival into one of four queues. The user may specify the maximum number of calls or the maximum length of time that a call may remain unanswered in a given queue. Once either the maximum permissible time or the maximum number of calls which may be queued is exceeded, the queue overflows. Calls which overflow are routed to the destination datafilled in the route field of the ACD groups table ACDGRP.

Ref:

FDOC BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	INCOMING CALL QUEUE
Feature no	F5968

FEATURE SYNOPSIS

Incoming calls to an ACD are queued if all agents are busy. Calls are removed from the queue as agents become available to handle them.

FEATURE DESCRIPTION

Calls terminating on an ACD are placed in the order of their arrival into one of four queues. Call queuing is subject to priority as well as the order of arrival. Associated with the incoming call is a priority, determined by translation of the ACD directory number that was dialed. Within each priority level, calls are queued in order of their arrival.

Ref:

FDOC BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	AGENT QUEUE
Feature no	F5969

FEATURE SYNOPSIS

Each ACD group has 3 queues of ACD agent positions which indicate the positions state of readiness to answer calls.

FEATURE DESCRIPTION

The three queues maintained within each ACD group for agent positions are as follows:

1. Agent positions available to receive calls.
2. Agent positions occupied with calls already in progress.
3. Agent positions which are not ready.

Agent positions are in one of the 3 queues except where the make set busy key on the agent's set is activated. The first queue has agent positions arranged in the order in which they became available from previous calls. The agent at the head of the queue has therefore been available for the longest time.

The second queue has agents who are occupied with calls in progress. The third queue has positions which are not ready. The latter queues are not ordered.

Ref:

FDOC BC1116

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	ACD CALL PROCESSING
Feature	ABANDONED CALL CLEARING
Feature no	F5970

FEATURE SYNOPSIS

Abandoned calls will be removed from incoming call queues and recorded announcement.

If a caller abandons a call after it has been presented at an agent position, the agent position is returned to an idle state and enqueued at the end of the idle queue.

Trunks to an SL-100 with ACD must provide disconnect supervision to prevent ACD agents from answering abandoned calls entering via trunk circuits.

Ref:

FDOC BC1116

Package NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set CONFERENCING
Feature 3WC TO CHAINING TO ACD INTERACTION
Feature no F6492

Package NTX407AA ACD
Feature Set ACD CALL PROCESSING CONTROL
Feature 3WC CHAINING TO ACD INTERACTION
Feature No F6492

FEATURE SYNOPSIS

Currently, Three Way Calling/Call Transfer to ACD, allows a station to terminate on an ACD-DN on the second leg of a simple 3WC and handles all interactions between simple 3WC and the ACD feature. This feature offers an added enhancement by handling new event and call configuration interactions introduced by 3WC chaining.

FEATURE DESCRIPTION

The purpose of this feature is to allow ACD and 3WC to handle events that can occur during, or resulting from, a 3WC chain involving an ACD agent. When an ACD agent is involved in a 3WC chain, any ACD or 3WC event (such as a Not Ready keyhit, MSB keyhit, ACD ring threshold timeout, abandonment, transfer, etc.) will proceed normally. The only exception to this rule is that a 3WC chain collapse will not result in a "mutual ringback" situation when the remaining call is an ACD call. In this case, the collapse will take the entire call down.

Although this feature implements the changes required to allow any ACD or 3WC event to proceed normally when an ACD agent is involved in a 3WC chain, the end result is transparent to the end user.

REFERENCES

FDOC - AD0613

Package	NTX407AB01 ACD - CALL PROCESSING (UPGR. OF NTX407AA)
Feature set	SECURITY
Feature	ACD AGENT LOGIN ENHANCEMENT
Feature no	F6493

FEATURE SYNOPSIS

With this enhancement, the agent login IDs can be partitioned between customer groups within the switch. Also, the ACD agents can be required to enter a 4 digit password if desired as part of the login process.

The automatic call distribution agent login enhancement feature is a method of ensuring that only ACD personnel assigned to a specific login ID may use that ID. Screening is accomplished through customer group restrictions and password association, based upon the login ID of the ACD agent. These screening restrictions are assigned in the new table ACDLOGIN and are both optional. For additional information on ACD login, reference DDOC BC1572.

FEATURE DESCRIPTION

Both the Make Set Busy (MSB) and ACD Not Ready (ACDNR) features must be assigned to the ACD agent position. The MSB must be active while the agent is logging onto the ACD agent position. The login process is started by either depressing the ACD INCALLS key or going offhook with the hand set. When any of the above actions are taken, the INCALLS key lamp should light, and special dial tone should be given. If the INCALLS key lamp is not lit and special dial tone not received, then an agent is already logged into the ACD agent position, the MSB feature or ACDNR feature is not assigned, the MSB feature is not active, or DTM, DOR, PLP, or SUS have been assigned to the ACD agent position.

The agent then enters a 4-digit number between 0001 and 9999. If the key set has a display, the number is displayed. Reorder tone is given if (1) an invalid ID is entered, or (2) if the ID entered is already logged into another ACD agent position.

If the login ID is valid then a check is made to see if the login ID has been datafilled in table ACDLOGIN. If no entry is found for the login ID then the regular login procedure is executed. (Ref DDOC BC1572) If an entry has been datafilled and if the customer group option, datafilled in table ACDLOGIN, has been set to "Y", a check is made to determine whether the customer group associated with the login ID matches the customer group of the incalls key of the set in which the agent is trying to log into. Reorder tone is given if this check fails. If the customer group option was set to "N", then the login procedure continues without executing this check.

After checking for customer group restrictions, the ACDLOGIN table is again checked to determine whether there is a password associated with

this login ID. If the password option has been set to "Y", then the agent will be given special dial tone. The agent then enters a 4- digit number between 0001 and 9999. Reorder tone is given if (1) the password entered is invalid or (2) if the ID entered is already logged into another ACD agent position. If the password option is set to "N" then there is no prompting for a password and the login procedure continues.

If all the above checks pass, then the ACD INCALLS key lamp is turned off, the MSB key lamp is turned off, the ACDNR key lamp is turned on, and the ACD agent is placed in the ACDNR queue. The MSB feature is now deactivated so calls placed to a secondary DN may terminate on the agent position.

The ACDSHOW command may be used to display the password of a given ACD login ID. This can be done via the PASSWORD subcommand, or determined via the LOGINID subcommand.

Ref:

DDOCS: BC1522, BZ0314, BC1116, BV0936, BC1572

ACD Product Spec Issue 1 85-05-27

Commercial Spec SL-100 Enhanced Voice Features 85-05-30

NTX410AA02 Status: RTM DYNAMIC ATTENDANT CONSOLE MEASUREMENTS

IBN	:	
DYNAMIC ATTENDANT CONSOLE MEASUREMENTS		F1636
ATTENDANT FEATURE	:	
ATTENDANT CONSOLE MONITOR DISPLAY		F6695

Package	NTX410AA02 DYNAMIC ATTENDANT CONSOLE MEASUREMENTS
Feature set	ATTENDANT FEATURE
Feature	ATTENDANT CONSOLE MONITOR DISPLAY
Feature no	F6695

FEATURE SYNOPSIS

This feature will provide a monitor Maintenance and Administration Position (MAP) level to display information of an individual attendant console. This information is updated every four seconds once a console has been selected at the monitor level.

FEATURE DESCRIPTION

Attendant console monitor display (ACMON) is a MAP display for certain information relative to a specific console. This information is displayed on a per console basis and is updated every 4 seconds. This MAP level can be entered by typing:

MAP CI; IBNMEAS; ACDYMS; ACMON <CR>

Information displayed includes the loop source and destination states, features activated etc.

Package	NTX411AA01 IBN - VOICE MESSAGING
Feature set	INTERFACE
Feature	VMX INTERFACE
Feature no	F3800

FEATURE SYNOPSIS

This feature provides for an interface between an SL-100 and a voice message exchange (VMX). The VMX may be accessed directly or calls may be forwarded or transferred to the VMX. Signalling between the SL-100 and the VMX will be via 4 wire E&M trunks with wink start.

FEATURE DESCRIPTION

VMX provides a voice message store and forward service. The system digitizes a spoken message and stores it on disk. Upon retrieval, the message is converted to an audible form. The subscriber will therefore hear the message in the senders own voice.

VMX communicates directly with the SL-100 using 4 wire E&M trunks. Communication is established using DTMF command codes. The codes are:

1. Call connect command codes.
2. VMX commands (dial and special).

Call connect command codes are used to interconnect the SL-100 and VMX. Their functions are as follows:

SL-100 to VMX Functions

To allow the VMX subscriber to access and manipulate messages in his mailbox.

To allow the VMX subscriber to use the call forward universal feature (ref V0451) to forward calls to his voice mailbox (VMX's call answering feature).

To allow anyone to leave a voice message for a VMX subscriber at the combination message desk.

VMX to SL-100 Functions

To enable the VMX to instruct the SL-100 to turn on a subscriber's message waiting indication.

To enable the VMX to instruct the SL-100 to turn off a subscriber's message waiting indication.

The user activates features by means of dial commands (two digits) and special dial commands (three digits) upon access to VMX. The dial commands are used to receive and send messages and invoke other standard VMX functions. The special commands are used for selected special VMX features.

User calls to VMX are identified through the use of a location code (for an ESN or stand alone SL-100 environment). Therefore, a user may view VMX as a remote location in an ESN network or non local (ie, remote) to a stand alone SL-100. The desired SL-100 to VMX function is invoked by using a different four digit extension number for each function.

Reference: FDOC BC1256

NTX412AA01 Status: RTM IBN - CUSTOMER STATION CHANGE

IBN	:	
CUSTOMER SERVICE CHANGE VIA SERVORD		F3784
ADMINISTRATION	:	
PARTITIONED SERVICE ORDER SYSTEM		F3870

Package	NTX412AA01 IBN - CUSTOMER STATION CHANGE
Feature set	IBN
Feature	CUSTOMER SERVICE CHANGE VIA SERVORD
Feature no	F3784

FEATURE SYNOPSIS

This feature permits specified users in a Customer Group to access the service order system. These users are able to manipulate directory numbers, line equipment numbers, features and options for their own customer group.

FEATURE DESCRIPTION

This feature allows the Operating Company to:

- reserve line equipment numbers for the exclusive use of selected IBN customer groups, and
- permit authorised persons from those customer groups to log on the DMS as a Maintenance and Administration Position (MAP) but prevent the user from accessing anything except service orders, and
- Restrict the customer groups authorised users so that only lines and DN's associated with the customer group are manipulated via service orders.

The customer group would use dial up ports to log on the switch.

Package	NTX412AA01 IBN - CUSTOMER STATION CHANGE
Feature set	ADMINISTRATION
Feature	PARTITIONED SERVICE ORDER SYSTEM
Feature no	F3870

FEATURE SYNOPSIS

This feature provides limited ability for IBN customer groups to be able to change some line data via service order system.

FEATURE DESCRIPTION

This feature will allow customers to logon to the DMS and make changes to their line data. The changes will only be allowed to be done via service orders (i.e. they will not be allowed to use table editor). The customers will only be allowed to add/delete options from their lines, move their DNS, or put their lines in/out of service. The only CI commands the customer will be allowed to execute will be LOGOUT, SERVORD, PASSWORD, QLEN and QDN.

The following restrictions will apply to the feature:

- existing attendant consoles and p-phones will not be used for CSCs
- attendant console assignments are not part of the CSC feature
- authcode and network assignments are not supported
- only IBN lines will be part of CSC
- number validity checking for 'forward to' number for 'forward don't answer' will not be part of the CSC feature
- normal switch restrictions will apply e.g. image taking, dump and restore
- the SWAP command will not process DNS which belong to hunt groups p-phones, data units, madn
- the service order commands NEWDN and OUTDN will not be available to CSC users

Software Package

NTX412AA

Ref: FDOC's BC0904, BC0905, BC1042, BC1202, BV1421

NTX412BA01 Status: RTM IBN - CUSTOMER STATION CHANGE

IBN	:	
CUSTOMER SERVICE CHANGE VIA SERVORD		F3784
CUSTOMER NETWORK DATA CHANGES		F3847
ADMINISTRATION	:	
PARTITIONED SERVICE ORDER SYSTEM		F3870

Package	NTX412BA01 IBN - CUSTOMER STATION CHANGE
Feature set	IBN
Feature	CUSTOMER SERVICE CHANGE VIA SERVORD
Feature no	F3784

FEATURE SYNOPSIS

This feature permits specified users in a Customer Group to access the service order system. These users are able to manipulate directory numbers, line equipment numbers, features and options for their own customer group.

FEATURE DESCRIPTION

This feature allows the Operating Company to:

- reserve line equipment numbers for the exclusive use of selected IBN customer groups, and
- permit authorised persons from those customer groups to log on the DMS as a Maintenance and Administration Position (MAP) but prevent the user from accessing anything except service orders, and
- Restrict the customer groups authorised users so that only lines and DN's associated with the customer group are manipulated via service orders.

The customer group would use dial up ports to log on the switch.

Package	NTX412BA01 IBN - CUSTOMER STATION CHANGE
Feature set	IBN
Feature	CUSTOMER NETWORK DATA CHANGES
Feature no	F3847

FEATURE SYNOPSIS

This feature will allow end office centrex customers to change some of their own data via service orders. Customers will only be able to see or change their own data.

FEATURE DESCRIPTION

The (CNC) customer network change feature will allow the customer group to view and modify certain translation and routing parameters.

In BCS 16, the concept of data ownership was introduced for customer groups, directory numbers and line equipment numbers for IBN 500 sets. This feature will extend to include ownership of trunk groups, virtual facility groups, authcode partition names and time of day system names. The concept of owner_ids will be introduced to generalize the concept of data ownership, and to divorce ownership from customer groups. This makes it possible for a non IBN user to own data. This feature will extend ownership of directory numbers and line equipment numbers for business sets, display business sets, IBN and POTS data units.

This feature is an extension to the CSC feature to avoid confusion with other products using the acronym 'CSC', where practical, we will use 'CDC' instead.

The user (telco) requires a means to allow customers to modify certain critical translation and routing parameters from their own premises without telco intervention. The parameters which need to be available for querying and/or modification are:

- . The NCOS, LSC or ALSC assigned to IBN trunks, and VFGs (virtual facility groups).
- . The NCOS, TRC or ATRC assigned to lines.
- . The current TOD (time of day) system result for TOD routing
- . The NCOS assigned to an auth code.
- . To add, delete or change authcodes.
- . To query a range of authcodes.

This feature will allow the telco to define an owner_id, associate it with a particular LOGON id and with one or more customer groups. This

owner_id will be the 'owner' of a subset of the data in the switch. When a user logs on to the DMS switch, the owner_id will be automatically associated with the logon session, and the user will only be allowed to see or to change a subset of the data in the switch.

The following is a list of new tables and old tables which are relevant to this feature:

OWNER - defines owner_id's

CDCLOGON - maps logon id's to owner_id's

CDCNS - stores ownership information for DN's

CDCLENS - stores ownership information for LEN's

CDCOPTS - contains list of line options which the customer has purchased

DATAOWNR - stores ownership information for various other tables

IBNLINES - contains all IBN lines

KSETINV - contains all business sets display business sets and data units

NOTE : Data unit can be IBN or POTS

Service order commands will be provided to allow the user to make the queries and changes described earlier in this section.

New service order commands are:

DSP - Display some translation and routing information.

- . Display NCOS, LSC and ALSC assigned to trunks and virtual facility groups.
- . Display current TOD system result.
- . Display NCOS assigned to an auth code.
- . Display NCOS, TRC and ATRC assigned to lines.
- . Display ranges of auth codes.

CHG - Change some translation and routing information.

- . Change NCOS, LSC and ALSC assigned to trunks and virtual facility groups.

- . Change current TOD system result.
- . Change NCOS assigned to an auth code.
- . Change value of an auth code.
- . Change NCOS, TRC and ATRC assigned to lines.

ADA - The user will be allowed to add a tuple in the table AUTHCDE.

DEA - The user will be allowed to delete a tuple from the table AUTHCDE.

All the existing service order commands will be enhanced to allow the CDC user to input LENS and DNS associated with business sets, display business sets and data units.

Below is a list of service order commands available to the CDC user.

NEW, OUT

ADO, DEO

EST, DEL

ADD

ABNN, DBNN

SUS, RES

PLP

CDN

Security invokes the use of password to ensure that only authorized users can have access to the DMS system. The methods of controlling the validity and assignment of passwords depend on whether the "enhanced security package" software is present and active, or not. Application of the enhanced security package is controlled by the enhanced_password_control field in table OFCOPT. This was provided by the feature password control BC0905; this feature provides enhanced password security ie, password encoding, enforced minimum password length, password ageing and a new CI command PASSWORD. Password changes must be made with the PASSWORD CI command.

It is recommended that password control feature be used in conjunction with customer data change offering. This will allow the customer data change users to be responsible for the passwords which were assigned to them by the telco.

Reference:

FDOB BV1552

Package	NTX412BA01 IBN - CUSTOMER STATION CHANGE
Feature set	ADMINISTRATION
Feature	PARTITIONED SERVICE ORDER SYSTEM
Feature no	F3870

FEATURE SYNOPSIS

This feature provides limited ability for IBN customer groups to be able to change some line data via service order system.

FEATURE DESCRIPTION

This feature will allow customers to logon to the DMS and make changes to their line data. The changes will only be allowed to be done via service orders (i.e. they will not be allowed to use table editor). The customers will only be allowed to add/delete options from their lines, move their DNS, or put their lines in/out of service. The only CI commands the customer will be allowed to execute will be LOGOUT, SERVORD, PASSWORD, QLEN and QDN.

The following restrictions will apply to the feature:

- existing attendant consoles and p-phones will not be used for CSCs
- attendant console assignments are not part of the CSC feature
- authcode and network assignments are not supported
- only IBN lines will be part of CSC
- number validity checking for 'forward to' number for 'forward don't answer' will not be part of the CSC feature
- normal switch restrictions will apply e.g. image taking, dump and restore
- the SWAP command will not process DNSs which belong to hunt groups p-phones, data units, madn
- the service order commands NEWDN and OUTDN will not be available to CSC users

Software Package

NTX412AA

Ref: FDOC's BC0904, BC0905, BC1042, BC1202, BV1421

NTX412CA03 Status: RTM IBN - CUSTOMER ADMINISTRATION OF DATA

IBN	:	
CUSTOMER SERVICE CHANGE VIA SERVORD		F3784
ADMINISTRATION	:	
CUSTOMER MANIPULATION OF TRUNK GROUP ROUTE LISTS		F3844
IBN	:	
CUSTOMER NETWORK DATA CHANGES		F3847
ADMINISTRATION	:	
PARTITIONED SERVICE ORDER SYSTEM		F3870
PARTITIONED TABLE EDITOR		F5634

Package	NTX412CA03 IBN - CUSTOMER ADMINISTRATION OF DATA
Feature set	IBN
Feature	CUSTOMER SERVICE CHANGE VIA SERVORD
Feature no	F3784

FEATURE SYNOPSIS

This feature permits specified users in a Customer Group to access the service order system. These users are able to manipulate directory numbers, line equipment numbers, features and options for their own customer group.

FEATURE DESCRIPTION

This feature allows the Operating Company to:

- reserve line equipment numbers for the exclusive use of selected IBN customer groups, and
- permit authorised persons from those customer groups to log on the DMS as a Maintenance and Administration Position (MAP) but prevent the user from accessing anything except service orders, and
- Restrict the customer groups authorised users so that only lines and DN's associated with the customer group are manipulated via service orders.

The customer group would use dial up ports to log on the switch.

Package	NTX412CA03 IBN - CUSTOMER ADMINISTRATION OF DATA
Feature set	ADMINISTRATION
Feature	CUSTOMER MANIPULATION OF TRUNK GROUP ROUTE LISTS
Feature no	F3844

FEATURE SYNOPSIS

This feature will allow the telco to define access rights to various existing table editor functions and tables for non-telco users. The non-telco users will be able to LOG ON to the DMS switch in the same way as for customer data change and access the data within the tables that telco has given the non-telco users access to.

This feature is related to the partition table editor feature and shows how to apply ownership to the tuples in different tables.

FEATURE DESCRIPTION

The telco can define the access rights to different tables and subtables for non-telco users by adding tuples to the CUSTPROT and SUBPROT tables and using the PERMIT command for the users.

Each user can be assigned to an owner ID which owns some data.

The access rights to tables can be one of the following READ only, CHANGE only, and READ/WRITE which is used to add/delete data.

Reference:

FDOC BC1254

Package	NTX412CA03 IBN - CUSTOMER ADMINISTRATION OF DATA
Feature set	IBN
Feature	CUSTOMER NETWORK DATA CHANGES
Feature no	F3847

FEATURE SYNOPSIS

This feature will allow end office centrex customers to change some of their own data via service orders. Customers will only be able to see or change their own data.

FEATURE DESCRIPTION

The (CNC) customer network change feature will allow the customer group to view and modify certain translation and routing parameters.

In BCS 16, the concept of data ownership was introduced for customer groups, directory numbers and line equipment numbers for IBN 500 sets. This feature will extend to include ownership of trunk groups, virtual facility groups, authcode partition names and time of day system names. The concept of owner_ids will be introduced to generalize the concept of data ownership, and to divorce ownership from customer groups. This makes it possible for a non IBN user to own data. This feature will extend ownership of directory numbers and line equipment numbers for business sets, display business sets, IBN and POTS data units.

This feature is an extension to the CSC feature to avoid confusion with other products using the acronym 'CSC', where practical, we will use 'CDC' instead.

The user (telco) requires a means to allow customers to modify certain critical translation and routing parameters from their own premises without telco intervention. The parameters which need to be available for querying and/or modification are:

- . The NCOS, LSC or ALSC assigned to IBN trunks, and VFGs (virtual facility groups).
- . The NCOS, TRC or ATRC assigned to lines.
- . The current TOD (time of day) system result for TOD routing
- . The NCOS assigned to an auth code.
- . To add, delete or change authcodes.
- . To query a range of authcodes.

This feature will allow the telco to define and owner_id, associate it with a particular LOGON id and with one or more customer groups. This

owner_id will be the 'owner' of a subset of the data in the switch. When a user logs on to the DMS switch, the owner_id will be automatically associated with the logon session, and the user will only be allowed to see or to change a subset of the data in the switch.

The following is a list of new tables and old tables which are relevant to this feature:

OWNER - defines owner_id's

CDCLOGON - maps logon id's to owner_id's

CDCNS - stores ownership information for DN's

CDCLENS - stores ownership information for LEN's

CDCOPTS - contains list of line options which the customer has purchased

DATAOWNR - stores ownership information for various other tables

IBNLINES - contains all IBN lines

KSETINV - contains all business sets display business sets and data units

NOTE : Data unit can be IBN or POTS

Service order commands will be provided to allow the user to make the queries and changes described earlier in this section.

New service order commands are:

DSP - Display some translation and routing information.

- . Display NCOS, LSC and ALSC assigned to trunks and virtual facility groups.
- . Display current TOD system result.
- . Display NCOS assigned to an auth code.
- . Display NCOS, TRC and ATRC assigned to lines.
- . Display ranges of auth codes.

CHG - Change some translation and routing information.

- . Change NCOS, LSC and ALSC assigned to trunks and virtual facility groups.

- . Change current TOD system result.
- . Change NCOS assigned to an auth code.
- . Change value of an auth code.
- . Change NCOS, TRC and ATRC assigned to lines.

ADA - The user will be allowed to add a tuple in the table AUTHCDE.

DEA - The user will be allowed to delete a tuple from the table AUTHCDE.

All the existing service order commands will be enhanced to allow the CDC user to input LENS and DNS associated with business sets, display business sets and data units.

Below is a list of service order commands available to the CDC user.

NEW, OUT

ADO, DEO

EST, DEL

ADD

ABNN, DBNN

SUS, RES

PLP

CDN

Security invokes the use of password to ensure that only authorized users can have access to the DMS system. The methods of controlling the validity and assignment of passwords depend on whether the "enhanced security package" software is present and active, or not. Application of the enhanced security package is controlled by the enhanced_password_control field in table OFCOPT. This was provided by the feature password control BC0905; this feature provides enhanced password security ie, password encoding, enforced minimum password length, password ageing and a new CI command PASSWORD. Password changes must be made with the PASSWORD CI command.

It is recommended that password control feature be used in conjunction with customer data change offering. This will allow the customer data change users to be responsible for the passwords which were assigned to them by the telco.

Reference:

FDOB BV1552

Package	NTX412CA03 IBN - CUSTOMER ADMINISTRATION OF DATA
Feature set	ADMINISTRATION
Feature	PARTITIONED SERVICE ORDER SYSTEM
Feature no	F3870

FEATURE SYNOPSIS

This feature provides limited ability for IBN customer groups to be able to change some line data via service order system.

FEATURE DESCRIPTION

This feature will allow customers to logon to the DMS and make changes to their line data. The changes will only be allowed to be done via service orders (i.e. they will not be allowed to use table editor). The customers will only be allowed to add/delete options from their lines, move their DNS, or put their lines in/out of service. The only CI commands the customer will be allowed to execute will be LOGOUT, SERVORD, PASSWORD, QLEN and QDN.

The following restrictions will apply to the feature:

- existing attendant consoles and p-phones will not be used for CSCs
- attendant console assignments are not part of the CSC feature
- authcode and network assignments are not supported
- only IBN lines will be part of CSC
- number validity checking for 'forward to' number for 'forward don't answer' will not be part of the CSC feature
- normal switch restrictions will apply e.g. image taking, dump and restore
- the SWAP command will not process DNS which belong to hunt groups p-phones, data units, madn
- the service order commands NEWDN and OUTDN will not be available to CSC users

Software Package

NTX412AA

Ref: FDOC's BC0904, BC0905, BC1042, BC1202, BV1421

Package	NTX412CA03 IBN - CUSTOMER ADMINISTRATION OF DATA
Feature set	ADMINISTRATION
Feature	PARTITIONED TABLE EDITOR
Feature no	F5634

FEATURE SYNOPSIS

This feature will allow operating company customers to do their own datafill. This includes the capability to add, delete, change and list their own tuples in a number of tables without telco intervention. It will provide security of data by preventing one user from viewing or modifying another user's data.

FEATURE DESCRIPTION

This feature provides the telco the following:

- To define access rights to various tables and subtables for non-telco users.
- Screening tables and subtables.
- To define access right to various table editor functions.
- Commands logging.

These users will be able to log on to the DMS switch in the same fashion as for customer data change (CDC) and access the data within the tables that the telco has given them access to.

Due to the number of tables involved this access would be through a new table editor (PTE) system, rather than through the service orders. The user would be given direct access to the tables, subject to some restrictions. He would see only the data which belongs to him, and data which the telco owns and makes public.

NTX413AA01 Status: RTM IBN - ENHANCED CALL FORWARDING

ATTENDANT FEATURE	:	
A/C ACTIVATE/DEACTIVATE OF CFU/CFI		F3795
STATION FEATURES	:	
REWRITE IBN CALL FORWARDING		F3804

Package	NTX413AA01 IBN - ENHANCED CALL FORWARDING
Feature set	ATTENDANT FEATURE
Feature	A/C ACTIVATE/DEACTIVATE OF CFU/CFI
Feature no	F3795

FEATURE SYNOPSIS

This feature allows attendants to activate, deactivate and program call forwarding for IBN stations with the Call Forwarding Universal/Call Forwarding Intragroup feature.

FEATURE DESCRIPTION

A console feature key must be assigned to Call Forward Station (CFS). The attendant can query, activate, deactivate or program call forward for the station.

Attendant keying sequence:

To query - CFS + Station DN + CFS

To deactivate - CFS + Station DN + # + CFS

To activate - CFS + Station DN + ³ + CFS

To program - CFS + Station DN + CFS + ³ + CFDN + CFS

Package	NTX413AA01 IBN - ENHANCED CALL FORWARDING
Feature set	STATION FEATURES
Feature	REWRITE IBN CALL FORWARDING
Feature no	F3804

FEATURE SYNOPSIS

This feature enhances the present DMS/SL-100 call forwarding feature by adding various options and allowing selection of call types to which call forwarding will be applied.

FEATURE DESCRIPTION

The following options of call forwarding are allowed:

CFU: Call forwarding universal will permit stations to forward calls to user defined locations inside and outside the customer group.

CFI: Call forwarding intragroup will allow forwarding calls within the customer group.

CFD: Call forward don't answer will forward the call if not answered within a prescribed time.

CDI: This option will deny forwarding intragroup calls for CFD option.

CDE: This option will deny forwarding of external (from outside the customer group) calls for the CFD option.

CFB: Call forwarding busy option will forward calls to the remote station in case the base station is busy.

CB1: This option will deny forwarding of intragroup calls for the CFB feature.

CBE: This option will deny forwarding of external calls for the CFB feature.

Package	NTX414AA01 IBN - DIRECTED CALL PARK, BUSINESS SET AND 2500	SE
Feature set	ATTENDANT FEATURE	
Feature	DIRECTED CALL PARK	
Feature no	F3925	

FEATURE SYNOPSIS

This feature will enable the user to park calls against other directory numbers as well as restrict the retrieval of parked calls by the use of station specific security codes.

FEATURE DESCRIPTION

The directed call park (DCPK) feature provides both p-phone and 2500 (IBN) stations with the capability of holding ("parking") one call against any valid IBN station directory number appearance in the system, from where it may later be retrieved by any station.

The use of a variable length security code will be added as a separate option (security code feature - BZ0221) which will allow up to ten features to be assigned to the security code. In the event that a call is parked against a directory number flagged "security", the retriever will be prompted by tone to enter the security code following his request for retrieval and digit entry of the directory number that the call parked against.

DCPK may be divided into two major components:

. Directed call park store:

This enables the parking of one call against a directory number. After requesting access to the directed call park feature, the user enters the digits of the directory number that the call is to be parked against.

. Call park retrieve:

This allows any station user to retrieve a parked call by first requesting the call park retrieve feature and then entering the directory number of the station against which the call was parked. This function is identical to that used in the feature call park, except in the case where a station is flagged "security" and a security code must be entered to retrieve the call (refer to section on feature assignment for more details).

Any p-phone or 2500 (IBN) station is capable of retrieving parked calls, even though that station may not have the directed call park feature assigned. On p-phones assigned a dedicated directed call park key, the same key may be used for both parking calls and retrieving them. The parking of a call against a directory number appearance does not inhibit that sta-

tion in any way - the line remains available for the origination and reception of calls.

Directed call park will be assigned on a line basis. Each customer group is limited to a maximum of 100 calls which may be parked simultaneously, whether by call park or directed call park.

DCPK may be considered an enhanced version of the call park feature, since it adds the capability of parking a call against any valid IBN station directory number (as opposed to only that of the parker) and the option of a security code.

References: FDOC BV1535, BV0938, BV0534, BZ0221

NTX415AA04 Status: RTM ACD BASIC

ACD BASIC	:	
ACD OBSERVE AGENT KEY		F3928
ACD AGENT STATUS LAMP		F3981
ACD CALL AGENT FEATURE		F5502
DISPLAY QUEUE STATUS KEY		F5600
SERVICE	:	
AGENT STATUS LAMPS		F5614
MAINTENANCE AND TSTING	:	
DOCUMENTATION OF MINOR ENHANCEMENTS		F5785
ACD BASIC	:	
ACD SHOW		F5862
ACD HEADSET		F5864

Package	NTX415AA04 ACD BASIC
Feature set	ACD BASIC
Feature	ACD OBSERVE AGENT KEY
Feature no	F3928

FEATURE SYNOPSIS

The OBSERVE AGENT feature key is one of the special purpose keys to be provided for use on the business set in conjunction with automatic call distribution.

The OBSERVE AGENT key enables a person to obtain either a listen path into a conversation between an ACD agent and caller or have a two way speech path into the conversation. The two way speech path is enabled via the CALL AGENT key.

FEATURE DESCRIPTION

The observe agent feature can be invoked at any time that a DN origination is valid. In the case where the observer is already active on the observe agent key. When the observe agent feature is initially invoked the observer enters OBS-selection mode. The OBS lamp turns on and the observer hears dial tone.

While in OBS-selection mode the observer can enter the extension of an agent positions incalls key to select an agent position to observe.

A call agent key is used in conjunction with an observe agent feature to enter OBS-conference mode from OBS-observation mode. If the call agent key is depressed by the observer while in OBS-observation mode, the observer's voice path is enabled and an OBS conference situation exists. The OBS lamp will change from being on to flashing.

Reference: FDOC BC1120

Package	NTX415AA04 ACD BASIC
Feature set	ACD BASIC
Feature	ACD AGENT STATUS LAMP
Feature no	F3981

FEATURE SYNOPSIS

This feature aids in the management of the resources of ACD groups, or more specifically, to aid in the management of ACD agent positions. It allows a supervisor to monitor the status of agent positions without interfering with their operation.

FEATURE DESCRIPTION

By assigning this feature to key lamp pairs on their sets, supervisors can monitor the status of agent positions. The keys currently do not have any use. The states of the lamps indicate the status of the associated agent positions. The lamps are updated whenever the status of the agent positions change, whatever the supervisor's mode of operation. On, off, flash, and wink are the possible states that the lamps can be in.

The states of an agent status lamp have the following meanings:

OFF - The agent position is not manned. (MSB lamp on)

ON - The agent is handling an ACD call.

FLASH - The agent is idle and waiting for an ACD call.

WINK - The agent is busy with post-call work. (NOT READY lamp on)

Reference: FDOC BC1009

Package	NTX415AA04 ACD BASIC
Feature set	ACD BASIC
Feature	ACD CALL AGENT FEATURE
Feature no	F5502

FEATURE SYNOPSIS

The ACD call agent feature is one of several features that have been developed to aid in the management of the resources of ACD groups. The call agent feature can either be used in conjunction with the observe agent feature to add a supervisor in to the ACD call that he/she is currently observing, or it can be used to call an agent position so a supervisor can communicate with an agent.

FEATURE DESCRIPTION

The call agent feature is assigned to a key-lamp pair on an electronic telephone set. Usually this set is manned by a supervisor. Once assigned, the call agent key (CAG) can either be used to originate a call, or be used in conjunction with the observe agent feature. The observe agent feature is also assigned to a key-lamp pair on an electronic telephone set. A set can have a call agent key without an observe agent key, and vice versa. If the observe agent feature is not assigned to a key on the set then the call agent key can only be used to originate a call.

Typically a call originated on a CAG is to an agent position so that the supervisor can communicate with the agent manning that position. But the destination of a call originated on a CAG does not necessarily have to be an agent position. Although this is not the intended use, it is not blocked. However, through datafill the supervisor can be restricted to only being able to make calls within the same customer group on the CAG.

When it is used in conjunction with an observe agent key, the call agent key conferences a supervisor in to the ACD call that he/she is currently observing. The observe agent feature enables a supervisor to listen in on an ACD call ("observation" mode) or be conferenced in to an ACD call ("conference" mode). In observation mode the supervisor can only listen to the ACD call being observed. If the supervisor wants to enter the conversation, the CAG can be pressed to move from observation mode into conference mode. The state of the lamp associated with the CAG is not affected. If the CAG is pressed while the observe feature is not in observation mode, the key hit is ignored and does not affect the observe agent feature or the state of the call agent key (which may be idle or in a held state).

Reference: FDOC BC1533

Package	NTX415AA04 ACD BASIC
Feature set	ACD BASIC
Feature	DISPLAY QUEUE STATUS KEY
Feature no	F5600

FEATURE SYNOPSIS

The display queue status (DQS) feature allows an ACD supervisor to display the load status information associated with an automatic call distribution (ACD) group.

FEATURE DESCRIPTION

The DQS key may be assigned to a display set which has key 1 assigned the SUPR feature. Each supervisor within the same customer group may have a DQS key for the same ACD group. Supervisors may also have multiple DQS keys to monitor different ACD groups within the same customer group. The ACD display queue status provides the user with timely and accurate statistics concerning the service being offered by an ACD group. The information displayed is:

1. Number of calls waiting in the ACD incoming call queue.
2. Number of agent positions available to answer calls.
3. Waiting time in seconds of first call in the highest priority queue.

Supervisors can use the displayed information to verify that calls are being handled efficiently given the number of attended agent positions.

Ref:

FDOC BC1008 ACD Display Queue Status Key

Package	NTX415AA04 ACD BASIC
Feature set	SERVICE
Feature	AGENT STATUS LAMPS
Feature no	F5614

FEATURE SYNOPSIS

This feature aids in the management of the resources of ACD groups, or more specifically, to aid in the management of ACD agent positions. It allows a supervisor to monitor the status of agent positions without interfering with their operation.

FEATURE DESCRIPTION

By assigning this feature to key lamp pairs on their sets, supervisors can monitor the status of agent positions. The keys currently do not have any use. The states of the lamps indicate the status of the associated agent positions. The lamps are updated whenever the status of the agent positions change, whatever the supervisor's mode of operation. On, off, flash and wink are the possible states that the lamps can be in.

The states of an agent status lamp have the following meanings:

OFF - The agent position is not manned. (MSB lamp on)

ON - The agent is handling an ACD call.

FLASH - The agent is idle and waiting for an ACD call.

WINK - The agent is busy with post call work. (NOT READY lamp on)

Reference: FDOC BC1009

Package	NTX415AA04 ACD BASIC
Feature set	ACD BASIC
Feature	ACD SHOW
Feature no	F5862

FEATURE SYNOPSIS

The information associated with ACD groups and subgroups is kept in various tables. The ACD show allows administrative personnel to Access some of the information from the tables in order to display agents, directory numbers and group or subgroup supervisors.

FEATURE DESCRIPTION

The CI command ACDSHOW is introduced. It provides the prompt ACDSHOW, to which help, quit or show may be entered as valid commands. The help, quit and show commands have the following functions:

HELP - display a list of the available commands.

QUIT - leaves the ACDSHOW increment.

SHOW - lists the information requested.

The show command may be used to produce the following display:

1. A list of agents by ACD group.
2. A list of DNS with their priorities.
3. The thresholds of a particular ACD group or all groups.
4. The ACD groupname, DN type and priority of a given DN.
5. A list of supervisors by ACD group.

Ref:

FDOC F5862

Package	NTX415AA04 ACD BASIC
Feature set	ACD BASIC
Feature	ACD HEADSET
Feature no	F5864

FEATURE SYNOPSIS

The ACD headset feature allows the use of a headset with an ACD set. Although the initial application of the ACD set with headset was for automatic call distribution agents use, the ACD set and headset may be used wherever a conventional electronic telephone set is used.

FEATURE DESCRIPTION

An ACD set is a modular electronic telephone set with headset jacks. When the headset is plugged into the jack, the set goes offhook. Jacking and unjacking the headset has the effect of placing the handset in the cradle and off the cradle respectively. As offhook overrides onhook, the set is offhook if either the handset is removed from the cradle or the headset is plugged in. The set is therefore onhook only when both the headset is unplugged and the handset is in its cradle.

Ref: FDOC BZ0242

NTX416AB02 Status: RTM ACD ENHANCED II(UPG. OF NTX416AA)

ACD ENHANCED	:	
ACD CALL FORCING		F3926
ACD EMERGENCY KEY		F3927
ACD SUPERVISOR KEY		F3929
SERVICE	:	
AGENT COMMUNICATION KEY		F5588
ACD ENHANCED	:	
ACD EXTENDED AGENT OBSERVE		F5589
ACD QUEUE STATUS LAMPS		F5590
ACD SUPERVISOR CONTROL OF NIGHT SERVICE		F5601
ACD SYSTEM INTEGRITY		F5848
ACD REAL TIME STATUS DISPLAY		F5861
ACD OVERFLOW ENHANCEMENT		F5886
DIFFERENTIATE ENH ACD SHOW FROM BASIC ACD SHOW - ENH I		F6167
ADMINISTRATION	:	
ACD REAL TIME DISPLAY ENHANCEMENT		F6208
ACD ENHANCED	:	
ACD AGENT AND SUPERVISOR POSITION ID MEMBERS		F6224
ACD EMERGENCY KEY - ENHANCED		F6538

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD CALL FORCING
Feature no	F3926

FEATURE SYNOPSIS

ACD call forcing allows incoming ACD (automatic call distribution) calls to be answered without the need of the agent pressing the incalls key, thereby speeding up the handling of ACD calls.

FEATURE DESCRIPTION

The ACD call forcing feature frees the ACD agent from conventional telephone interactions such as pressing the incalls key for each incoming call. When call forcing is active, a 500 millisecond burst of tone will accompany an incoming call. During the burst of tone from the set, the LCD associated with the incalls key will flash. At the end of the tone burst period, the call will be automatically answered, the LCD will be illuminated and the agent will be able to talk with the caller. Although this feature will function with a standard electronic business set, it is recommended for use in conjunction with the headset feature.

Ref:

FDOC BC1115 ACD Call Forcing
FDOC BZ0242 ACD Headset

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD EMERGENCY KEY
Feature no	F3927

FEATURE SYNOPSIS

The ACD emergency key feature is an agent position related feature which enables an ACD agent, in the event of threatening or abusive calls to immediately conference in a supervisor or an auxilliary device.

FEATURE DESCRIPTION

The ACD supervisor position may be equipped with a key which is designated as the answer emergency key. The agent position is equipped with an EMK (emergency key). The EMK may be activated while the agent is active on an ACD call. Upon EMK activation, the AEMK (answer emergency key) on the supervisors position will flash accompanied by the sets warble tone. Upon supervisor answer, the AEMK will be solidly illuminated and a 3 way conference established between the ACD caller, the agent and the supervisor. Alternatively an auxilliary device is rung when the agent's EMK is activated. The auxilliary device may be a 500/2500 set or automatic answering or recording device.

Ref: DDOC BC1117

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD SUPERVISOR KEY
Feature no	F3929

FEATURE SYNOPSIS

This feature allows communication between the agent and the supervisor in a more efficient manner than through programming a key or dialing digits.

FEATURE DESCRIPTION

This feature allows communication between the agent and supervisor in the following manner:

Agent Call to Supervisor:

1. Agent depresses call supervisor key (CLSUP) on Electronic Telephone Set (ETS).
2. The Answer Agent Key (AAK) rings and its associated lamp flashes at the supervisory position.
3. Supervisor depresses AAK and communicates with agent.

Supervisor Call to Agent:

1. Supervisor depresses Call Agent Key (CAK) followed by agent key.
2. CLSUP key rings and associated lamp flashes at agent's position.
3. Agent depresses CLSUP key and communicates with supervisor.

In the use of an agent call to a supervisor, reorder tone or no DN display results if no AAK exists. Prior to this feature, busy tone resulted if the line was busy. With this feature, if the make set busy override (MSBOVRD) field in the KSETLINE table has been set to 'Y' for that specific agent, the call will ring the supervisor's set.

In the case of a supervisor's call to an agent, reorder tone results if no CLSUP key exists. If the ETSS are equipped with displays, the associated CLSUP or AAK DNs are displayed at the respective sets.

With the ACD Management Report package, the agent may use the CLSUP key to call the supervisor or to respond to a call from a supervisor, even if the agent is not logged into the agent position.

If the ACD Load Management Package is in load, the ACD group and ACD subgroup may be different than those for the ACD INCALLS key, however, the customer group must be the same. This may be beneficial for experienced

agents who do not require communication with the new supervisor when temporarily reassigned.

While only AAK may exist for each ACD subgroup, one supervisor may have multiple AAK keys, allowing a supervisor to answer calls from multiple ACD subgroups. Further the SUPR feature need not be present on the supervisor's set when assigning the AAK but may be assigned to a senior ACD agent.

Ref: DDOC BC1121

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	SERVICE
Feature	AGENT COMMUNICATION KEY
Feature no	F5588

FEATURE SYNOPSIS

The ACD Agent Key (AGT) feature is intended to simplify the observe agent feature (OBS) and call agent feature (CAG) by allowing a supervisor to depress an agent key instead of dialing a directory number after an observe or call agent key-hit. The agent and supervisor must be in the same customer group.

FEATURE DESCRIPTION

This feature is used in conjunction with the OBS feature and CAG feature as follows:

OBS Feature with AGT Key - To have a call between an ACD agent and a calling party, the supervisor depresses the OBS key followed by the AGT key associated with an individual agent which replaces dialing an agent's INCALLS key DN. If a display exists, the INCALLS key DN will be displayed when the AGT key is hit.

CAG Feature with AGT Key - To call an ACD agent, the supervisor depresses the CAG key followed by the AGT key which replaces dialing an agent's INCALLS key DN. Since the call can only terminate on a call supervisor key (CLSUP) at the agent's position, the CLSUP key must be assigned or reorder is given. If equipped with displays, the appropriate DNs are displayed at the agent and supervisor positions when the AGT key is hit. A SMDR record is optionally available by adding the SMDR option to the CAG key in table KSETLINK. MSBUVRD is also optionally available by assigning MSBIVRD option to the AGT key thus causing the agent's CLSUP key to ring even if the MSB key is hit.

Agent keys cannot be temporarily reassigned therefore, access to a temporarily reassigned agent position is only possible by dialing the agent's DN digits.

The agent key feature uses the datafill for the agent status lamp (ALSL) feature and therefore the lamp associated with the AGT key always reflects the status of the agent.

Ref: DDOC BC1531

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD EXTENDED AGENT OBSERVE
Feature no	F5589

FEATURE SYNOPSIS

The extended agent observe feature allows a supervisor to observe ACD calls on any agent position that is in the same customer group as the as the supervisor position on which the extended agent observe feature key is located.

FEATURE DESCRIPTION

The Extended Agent Observe feature is an enhancement of the existing ACD Observe Agent feature (BC1120) that gives an ACD supervisor additional capabilities to control the quality of service offered to callers and to monitor the overall performance of ACD agents.

With the extended observe feature, a supervisor can observe (see BC1120 for details) an established ACD call answered at any ACD agent or supervisor position that has an INCALLS key in any ACD group within the same customer group (as the supervisor/observer) by pressing the Observe Agent key and dialling the extension of the INCALLS key of the position to be observed.

ref:

FDOC BC1007

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD QUEUE STATUS LAMPS
Feature no	F5590

FEATURE SYNOPSIS

This feature provides a visual indication whenever the incoming call queue to an ACD group overflows.

FEATURE DESCRIPTION

A queue overflow occurs when the maximum number of calls are queued and/or the wait time of the first call in the queue exceeds the maximum wait specified. The visual indication is made by turning on a lamp on an external device via an MTM SD point during the audit process. Approximately once each minute the audit runs and if during this time a queue overflow is detected, the lamp is illuminated. The lamp remaining illuminated until the audit determines that the ACD group resumes queuing calls. The ACD customer may define, the maximum number of calls which may be queued at any one time, as well as the maximum length of time a call should have to wait in the incoming call queue; for each ACD group. The feature provides the means to datafill an SD point for each ACD group.

Ref: DDOC BC1011

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD SUPERVISOR CONTROL OF NIGHT SERVICE
Feature no	F5601

FEATURE SYNOPSIS

This feature provides for a night service key on the supervisors set to allow the supervisor to place an ACD group in the night service mode.

FEATURE DESCRIPTION

An ACD supervisor who is assigned a night service key or multiple keys may place an ACD group in night service mode by depressing the night service key for each ACD group. A supervisor may have multiple night service keys but only one night service key per ACD group. Only one supervisor set can have a night service key for a given ACD group.

When the night service key is activated by the supervisor, new calls are blocked from the incoming call queue and given a night service treatment which may be customer specified at datafill time. This feature interacts with make set busy in that if make set busy is activated by all agents in a group, calls which are in the incoming call queue will remain there until the caller abandons or an agent answers, whether night service is activated or not.

Ref:

FDOC BC1010

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD SYSTEM INTEGRITY
Feature no	F5848

FEATURE SYNOPSIS

This feature helps to ensure the integrity of the ACD system through datafill restrictions and warnings of possible configuration violations.

FEATURE DESCRIPTION

At datafill, the following checks are made for ACD call processing features:

- a) Feature control block resource check.
- b) Feature event queuing (FTRQ) resource check.

The Feature Control Block Resource Check:

When an ACD group is datafilled in table ACDGRP the total of all of the MAXQSIZ fields is compared with NO_OF_FTR_CONTROL_BLKs and with NO_OF_FTR_DATA_BLKs office parameters. If the MAXQSIZ total exceeds 7⁵ of the parameter NO_OF_FTR_CONTROL_BLKs parameter, a message is generated on the MAP screen "WARNING__POTENTIALLY NOT ENOUGH FCBs ALLOCATED. If the MAXQSIZ total exceeds 7⁵ of the parameter NO_OF_FTR_DATA_BLKs then the MAP message is WARNING__POTENTIALLY NOT ENOUGH FDBs ALLOCATED.

The Feature Event Queuing (FTRQ) Resource Check:

Four warning messages can be generated by this check:

1. Warning__potential FTRQ agent area problem__ more than 7⁵ used by ACD. This message is generated when the number of INCALLS keys datafilled exceeds 7⁵ of the number of FTRQ agent areas allocated.
2. Warning__potential FTRQ 8warea prblem__ more than 7⁵ used by ACD. This message is generated when the number of INCALLS keys datafilled exceeds 7⁵ of the number of FTRQ 8warea's allocated.
3. Warning__potential FTRQ agent area problem__10⁶ used by ACD.
4. Warning__potential FTRQ 8warea problem__10⁶ used by ACD.

In each case the warning message is generated and the tuple is allowed to be added.

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD REAL TIME STATUS DISPLAY
Feature no	F5861

FEATURE SYNOPSIS

The ACD real time status display feature allows the user to periodically display a management report for the ACD (automatic call distribution) groups via an async data link.

FEATURE DESCRIPTION

At user specified time intervals, a report is produced and displayed at a CRT terminal or printer. The output device, CRT or printer is attached to an IOC port. The report which is produced contains the following data for each ACD group:

- a) A time stamp of the time the report was generated.
- b) The ACD group name.
- c) The primary ACD directory number (DN).
- d) The total number of calls in the ACD queue.
- e) The number of seconds that the last call, connected to an agent, was in the queue.
- f) The number of attended ACD positions.
- g) The number of positions handling ACD calls (occupied).
- h) The number of ACD positions.
- i) The number of idle positions.
- j) The number of positions, not ready.
- k) The number of positions in the make set busy mode.

Ref:

FDOC BC1555

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD OVERFLOW ENHANCEMENT
Feature no	F5886

FEATURE SYNOPSIS

This feature allows the user to specify up to 4 ACD groups as overflow groups for a given ACD group.

FEATURE DESCRIPTION

A call coming into an ACD group may terminate on an available agent or get placed in the incoming call queue if no agent is available. If the call queue threshold is exceeded calls will overflow to the threshold route. This enhancement applies only to the threshold route. This feature enhances but does not replace the ability of ACD calls to be overflowed to any destination specified in either table OFRT or IBNRTE.

The user may specify in table ACDOVFL a list of up to 4 ACD groups to which calls to a particular ACD group can overflow. If the user does not require enhanced overflowing, then no entry is made in table ACDOVL. All ACD groups must be on the same switch.

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	DIFFERENTIATE ENH ACD SHOW FROM BASIC ACD SHOW - E
Feature no	F6167

FEATURE SYNOPSIS

ACD Show - Enhancement I provides additional capabilities to the ACDSHOW feature. These additional commands provide the means to look at routing information which can be modified through ACD Load Management.

FEATURE DESCRIPTION

The ACD Show - Enhancement I feature provides additional routing information commands that allow administrative personnel to display the following:

- Display the Night Service Route (NSROUTE) for an ACD group.
- Display the Incoming call queue overflow route for an ACD group.
- Display the enhanced overflow route for an ACD group.
- Display a table entry in table OFRT (Office Route Table) or table IBNRTE (IBN route table).

The routing information found in the table specified is displayed in an easily understandable form. Routing information may be displayed for a particular ACD group or for all ACD groups. The commands available through ACD Show - Enhancement I are intended for administrative use and to be executed at a Maintenance and Administrative Position (MAP).

Ref: DDOC AD0181
DDOC BC1559 - ADC Show

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ADMINISTRATION
Feature	ACD REAL TIME DISPLAY ENHANCEMENT
Feature no	F6208

FEATURE SYNOPSIS

This feature enhances Basic ACD Real Time Display (ACDRTD) so that more than one datalink can use the feature and a simple management report of selected ACD group(s) is periodically generated and transferred to an output device via the associated datalink.

FEATURE DESCRIPTION

With the ACD Real Time Display Enhancement feature, the user can manipulate the ACDRTD datalinks to route specific sets of ACD group statistics to the respective output devices. The ACD groups can be partitioned into a maximum of 16 sets, with each set being routed to an individual output device. This partitioning of ACD groups statistics into sets to be displayed on individual output devices leads to a more timely and accurate ACD Real Time Display.

The ACDRTD Enhancement feature allows the user to perform the following functions from a Maintenance and Administrative Position (MAP):

- 1) Route statistics for selected ACD group(s) to a specified output device.
- 2) Start and stop the ACDRTD for specified group(s).
- 3) Set the frequency of ACD groups report generation.
- 4) Obtain status information on datalinks and ACD groups.

Simple maintenance and control of the datalinks is provided via a CI increment called LNKUTIL, while the CI increment ACDRTDIS is used to manage the datalinks and the ACD groups statistics that will be printed on the ACDRT display.

Ref: DDOC AD0179

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD AGENT AND SUPERVISOR POSITION ID MEMBERS
Feature no	F6224

FEATURE SYNOPSIS

This feature associates an Agent Position ID (AGENT_POS_ID) number with the Electronic Telephone Set (ETS) of an agent position and a Supervisor Position ID (SUPR_POS_ID) number with the ETS of a supervisory position for the Management Report System (MGTRPT). Both ID numbers are implemented as part of the ACD basic package.

FEATURE DESCRIPTION

This feature assigns a unique sequential four digit identification number in the range 0001-9999 to the AGENT_POS_ID and SUPR_POS_ID when 'Y' is entered for IDNUM (ID number) during INCALLS key and SUPR key datafill. Each four digit number identifies the ETS of an agent or supervisory position.

If the ACD group has been assigned the MGTRPT option, the management report interface will send call processing and agent position event messages to the downstream (DS) processor.

Ref: DDOC BC1562

Package	NTX416AB02 ACD ENHANCED II(UPG. OF NTX416AA)
Feature set	ACD ENHANCED
Feature	ACD EMERGENCY KEY - ENHANCED
Feature no	F6538

FEATURE SYNOPSIS

This feature provides the capability for the ACD Emergency Key Feature to activate a recorder and the supervisor simultaneously.

FEATURE DESCRIPTION

This feature enables an ACD agent to conference in an ACD supervisor and/or an auxiliary device (eg. tape recorder) via a single key depression. The ACD supervisor would receive the call on his ACD Answer Emergency Key (AEMK), and the auxiliary device would be called like any single line oriented device.

If an Answer Emergency Key is being used, when the ACD Agent presses the Emergency Key (EMK) while active on a normal ACD call, a key designated as the AEMK on the ACD supervisor's set will ring and its associated lamp will flash. The supervisor can then press the AEMK key and be conferenced into the call.

If both the AEMK and auxiliary device are being used, both will ring and be conferenced into the call when answered. Both of these calls will ring for a maximum of thirty (30) seconds. If they are not answered in this time, the calls will be abandoned.

A LOG message will be output upon initial depression of the ACD EMK Key supplying additional information dealing with the call.

Ref: FDOC - AD0845

NTX416AC01 Status: LTD ACD ENHANCED II(UPG. OF NTX416AB)

ACD ENHANCED	:	
ACD CALL FORCING		F3926
ACD EMERGENCY KEY		F3927
ACD SUPERVISOR KEY		F3929
SERVICE	:	
AGENT COMMUNICATION KEY		F5588
ACD ENHANCED	:	
ACD EXTENDED AGENT OBSERVE		F5589
ACD QUEUE STATUS LAMPS		F5590
ACD SUPERVISOR CONTROL OF NIGHT SERVICE		F5601
ACD SYSTEM INTEGRITY		F5848
ACD REAL TIME STATUS DISPLAY		F5861
ACD OVERFLOW ENHANCEMENT		F5886
DIFFERENTIATE ENH ACD SHOW FROM BASIC ACD SHOW - ENH I		F6167
ADMINISTRATION	:	
ACD REAL TIME DISPLAY ENHANCEMENT		F6208
ACD ENHANCED	:	
ACD AGENT AND SUPERVISOR POSITION ID MEMBERS		F6224
ACD EMERGENCY KEY - ENHANCED		F6538
ACD MULTI-STAGE QUEUE STATUS LAMP		G0075
ACD	:	
ACD CALLED NAME/NUMBER DISPLAY		G0089

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD CALL FORCING
Feature no	F3926

FEATURE SYNOPSIS

ACD call forcing allows incoming ACD (automatic call distribution) calls to be answered without the need of the agent pressing the incalls key, thereby speeding up the handling of ACD calls.

FEATURE DESCRIPTION

The ACD call forcing feature frees the ACD agent from conventional telephone interactions such as pressing the incalls key for each incoming call. When call forcing is active, a 500 millisecond burst of tone will accompany an incoming call. During the burst of tone from the set, the LCD associated with the incalls key will flash. At the end of the tone burst period, the call will be automatically answered, the LCD will be illuminated and the agent will be able to talk with the caller. Although this feature will function with a standard electronic business set, it is recommended for use in conjunction with the headset feature.

Ref:

FDOC BC1115 ACD Call Forcing
FDOC BZ0242 ACD Headset

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD EMERGENCY KEY
Feature no	F3927

FEATURE SYNOPSIS

The ACD emergency key feature is an agent position related feature which enables an ACD agent, in the event of threatening or abusive calls to immediately conference in a supervisor or an auxiliary device.

FEATURE DESCRIPTION

The ACD supervisor position may be equipped with a key which is designated as the answer emergency key. The agent position is equipped with an EMK (emergency key). The EMK may be activated while the agent is active on an ACD call. Upon EMK activation, the AEMK (answer emergency key) on the supervisors position will flash accompanied by the sets warble tone. Upon supervisor answer, the AEMK will be solidly illuminated and a 3 way conference established between the ACD caller, the agent and the supervisor. Alternatively an auxiliary device is rung when the agent's EMK is activated. The auxiliary device may be a 500/2500 set or automatic answering or recording device.

Ref: DDOC BC1117

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD SUPERVISOR KEY
Feature no	F3929

FEATURE SYNOPSIS

This feature allows communication between the agent and the supervisor in a more efficient manner than through programming a key or dialing digits.

FEATURE DESCRIPTION

This feature allows communication between the agent and supervisor in the following manner:

Agent Call to Supervisor:

1. Agent depresses call supervisor key (CLSUP) on Electronic Telephone Set (ETS).
2. The Answer Agent Key (AAK) rings and its associated lamp flashes at the supervisory position.
3. Supervisor depresses AAK and communicates with agent.

Supervisor Call to Agent:

1. Supervisor depresses Call Agent Key (CAK) followed by agent key.
2. CLSUP key rings and associated lamp flashes at agent's position.
3. Agent depresses CLSUP key and communicates with supervisor.

In the use of an agent call to a supervisor, reorder tone or no DN display results if no AAK exists. Prior to this feature, busy tone resulted if the line was busy. With this feature, if the make set busy override (MSBOVRD) field in the KSETLINE table has been set to 'Y' for that specific agent, the call will ring the supervisor's set.

In the case of a supervisor's call to an agent, reorder tone results if no CLSUP key exists. If the ETSS are equipped with displays, the associated CLSUP or AAK DNs are displayed at the respective sets.

With the ACD Management Report package, the agent may use the CLSUP key to call the supervisor or to respond to a call from a supervisor, even if the agent is not logged into the agent position.

If the ACD Load Management Package is in load, the ACD group and ACD subgroup may be different than those for the ACD INCALLS key, however, the customer group must be the same. This may be beneficial for experienced

agents who do not require communication with the new supervisor when temporarily reassigned.

While only AAK may exist for each ACD subgroup, one supervisor may have multiple AAK keys, allowing a supervisor to answer calls from multiple ACD subgroups. Further the SUPR feature need not be present on the supervisor's set when assigning the AAK but may be assigned to a senior ACD agent.

Ref: DDOC BC1121

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	SERVICE
Feature	AGENT COMMUNICATION KEY
Feature no	F5588

FEATURE SYNOPSIS

The ACD Agent Key (AGT) feature is intended to simplify the observe agent feature (OBS) and call agent feature (CAG) by allowing a supervisor to depress an agent key instead of dialing a directory number after an observe or call agent key-hit. The agent and supervisor must be in the same customer group.

FEATURE DESCRIPTION

This feature is used in conjunction with the OBS feature and CAG feature as follows:

OBS Feature with AGT Key - To have a call between an ACD agent and a calling party, the supervisor depresses the OBS key followed by the AGT key associated with an individual agent which replaces dialing an agent's INCALLS key DN. If a display exists, the INCALLS key DN will be displayed when the AGT key is hit.

CAG Feature with AGT Key - To call an ACD agent, the supervisor depresses the CAG key followed by the AGT key which replaces dialing an agent's INCALLS key DN. Since the call can only terminate on a call supervisor key (CLSUP) at the agent's position, the CLSUP key must be assigned or reorder is given. If equipped with displays, the appropriate DNs are displayed at the agent and supervisor positions when the AGT key is hit. A SMDR record is optionally available by adding the SMDR option to the CAG key in table KSETLINK. MSBUVRD is also optionally available by assigning MSBIVRD option to the AGT key thus causing the agent's CLSUP key to ring even if the MSB key is hit.

Agent keys cannot be temporarily reassigned therefore, access to a temporarily reassigned agent position is only possible by dialing the agent's DN digits.

The agent key feature uses the datafill for the agent status lamp (ALSL) feature and therefore the lamp associated with the AGT key always reflects the status of the agent.

Ref: DDOC BC1531

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD EXTENDED AGENT OBSERVE
Feature no	F5589

FEATURE SYNOPSIS

The extended agent observe feature allows a supervisor to observe ACD calls on any agent position that is in the same customer group as the as the supervisor position on which the extended agent observe feature key is located.

FEATURE DESCRIPTION

The Extended Agent Observe feature is an enhancement of the existing ACD Observe Agent feature (BC1120) that gives an ACD supervisor additional capabilities to control the quality of service offered to callers and to monitor the overall performance of ACD agents.

With the extended observe feature, a supervisor can observe (see BC1120 for details) an established ACD call answered at any ACD agent or supervisor position that has an INCALLS key in any ACD group within the same customer group (as the supervisor/observer) by pressing the Observe Agent key and dialling the extension of the INCALLS key of the position to be observed.

ref:

FDOC BC1007

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD QUEUE STATUS LAMPS
Feature no	F5590

FEATURE SYNOPSIS

This feature provides a visual indication whenever the incoming call queue to an ACD group overflows.

FEATURE DESCRIPTION

A queue overflow occurs when the maximum number of calls are queued and/or the wait time of the first call in the queue exceeds the maximum wait specified. The visual indication is made by turning on a lamp on an external device via an MTM SD point during the audit process. Approximately once each minute the audit runs and if during this time a queue overflow is detected, the lamp is illuminated. The lamp remaining illuminated until the audit determines that the ACD group resumes queuing calls. The ACD customer may define, the maximum number of calls which may be queued at any one time, as well as the maximum length of time a call should have to wait in the incoming call queue; for each ACD group. The feature provides the means to datafill an SD point for each ACD group.

Ref: DDOC BC1011

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD SUPERVISOR CONTROL OF NIGHT SERVICE
Feature no	F5601

FEATURE SYNOPSIS

This feature provides for a night service key on the supervisors set to allow the supervisor to place an ACD group in the night service mode.

FEATURE DESCRIPTION

An ACD supervisor who is assigned a night service key or multiple keys may place an ACD group in night service mode by depressing the night service key for each ACD group. A supervisor may have multiple night service keys but only one night service key per ACD group. Only one supervisor set can have a night service key for a given ACD group.

When the night service key is activated by the supervisor, new calls are blocked from the incoming call queue and given a night service treatment which may be customer specified at datafill time. This feature interacts with make set busy in that if make set busy is activated by all agents in a group, calls which are in the incoming call queue will remain there until the caller abandons or an agent answers, whether night service is activated or not.

Ref:

FDOC BC1010

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD SYSTEM INTEGRITY
Feature no	F5848

FEATURE SYNOPSIS

This feature helps to ensure the integrity of the ACD system through datafill restrictions and warnings of possible configuration violations.

FEATURE DESCRIPTION

At datafill, the following checks are made for ACD call processing features:

- a) Feature control block resource check.
- b) Feature event queuing (FTRQ) resource check.

The Feature Control Block Resource Check:

When an ACD group is datafilled in table ACDGRP the total of all of the MAXQSIZ fields is compared with NO_OF_FTR_CONTROL_BLKs and with NO_OF_FTR_DATA_BLKs office parameters. If the MAXQSIZ total exceeds 7⁵ of the parameter NO_OF_FTR_CONTROL_BLKs parameter, a message is generated on the MAP screen "WARNING__POTENTIALLY NOT ENOUGH FCBs ALLOCATED. If the MAXQSIZ total exceeds 7⁵ of the parameter NO_OF_FTR_DATA_BLKs then the MAP message is WARNING__POTENTIALLY NOT ENOUGH FDBs ALLOCATED.

The Feature Event Queuing (FTRQ) Resource Check:

Four warning messages can be generated by this check:

1. Warning__potential FTRQ agent area problem__ more than 7⁵ used by ACD. This message is generated when the number of INCALLS keys datafilled exceeds 7⁵ of the number of FTRQ agent areas allocated.
2. Warning__potential FTRQ 8warea prblem__ more than 7⁵ used by ACD. This message is generated when the number of INCALLS keys datafilled exceeds 7⁵ of the number of FTRQ 8warea's allocated.
3. Warning__potential FTRQ agent area problem__10⁶ used by ACD.
4. Warning__potential FTRQ 8warea problem__10⁶ used by ACD.

In each case the warning message is generated and the tuple is allowed to be added.

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD REAL TIME STATUS DISPLAY
Feature no	F5861

FEATURE SYNOPSIS

The ACD real time status display feature allows the user to periodically display a management report for the ACD (automatic call distribution) groups via an async data link.

FEATURE DESCRIPTION

At user specified time intervals, a report is produced and displayed at a CRT terminal or printer. The output device, CRT or printer is attached to an IOC port. The report which is produced contains the following data for each ACD group:

- a) A time stamp of the time the report was generated.
- b) The ACD group name.
- c) The primary ACD directory number (DN).
- d) The total number of calls in the ACD queue.
- e) The number of seconds that the last call, connected to an agent, was in the queue.
- f) The number of attended ACD positions.
- g) The number of positions handling ACD calls (occupied).
- h) The number of ACD positions.
- i) The number of idle positions.
- j) The number of positions, not ready.
- k) The number of positions in the make set busy mode.

Ref:

FDOC BC1555

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD OVERFLOW ENHANCEMENT
Feature no	F5886

FEATURE SYNOPSIS

This feature allows the user to specify up to 4 ACD groups as overflow groups for a given ACD group.

FEATURE DESCRIPTION

A call coming into an ACD group may terminate on an available agent or get placed in the incoming call queue if no agent is available. If the call queue threshold is exceeded calls will overflow to the threshold route. This enhancement applies only to the threshold route. This feature enhances but does not replace the ability of ACD calls to be overflowed to any destination specified in either table OFRT or IBNRTE.

The user may specify in table ACDOVFL a list of up to 4 ACD groups to which calls to a particular ACD group can overflow. If the user does not require enhanced overflowing, then no entry is made in table ACDOVL. All ACD groups must be on the same switch.

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	DIFFERENTIATE ENH ACD SHOW FROM BASIC ACD SHOW - E
Feature no	F6167

FEATURE SYNOPSIS

ACD Show - Enhancement I provides additional capabilities to the ACDSHOW feature. These additional commands provide the means to look at routing information which can be modified through ACD Load Management.

FEATURE DESCRIPTION

The ACD Show - Enhancement I feature provides additional routing information commands that allow administrative personnel to display the following:

- Display the Night Service Route (NSROUTE) for an ACD group.
- Display the Incoming call queue overflow route for an ACD group.
- Display the enhanced overflow route for an ACD group.
- Display a table entry in table OFRT (Office Route Table) or table IBNRTE (IBN route table).

The routing information found in the table specified is displayed in an easily understandable form. Routing information may be displayed for a particular ACD group or for all ACD groups. The commands available through ACD Show - Enhancement I are intended for administrative use and to be executed at a Maintenance and Administrative Position (MAP).

Ref: DDOC AD0181
DDOC BC1559 - ADC Show

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ADMINISTRATION
Feature	ACD REAL TIME DISPLAY ENHANCEMENT
Feature no	F6208

FEATURE SYNOPSIS

This feature enhances Basic ACD Real Time Display (ACDRTD) so that more than one datalink can use the feature and a simple management report of selected ACD group(s) is periodically generated and transferred to an output device via the associated datalink.

FEATURE DESCRIPTION

With the ACD Real Time Display Enhancement feature, the user can manipulate the ACDRTD datalinks to route specific sets of ACD group statistics to the respective output devices. The ACD groups can be partitioned into a maximum of 16 sets, with each set being routed to an individual output device. This partitioning of ACD groups statistics into sets to be displayed on individual output devices leads to a more timely and accurate ACD Real Time Display.

The ACDRTD Enhancement feature allows the user to perform the following functions from a Maintenance and Administrative Position (MAP):

- 1) Route statistics for selected ACD group(s) to a specified output device.
- 2) Start and stop the ACDRTD for specified group(s).
- 3) Set the frequency of ACD groups report generation.
- 4) Obtain status information on datalinks and ACD groups.

Simple maintenance and control of the datalinks is provided via a CI increment called LNKUTIL, while the CI increment ACDRTDIS is used to manage the datalinks and the ACD groups statistics that will be printed on the ACDRT display.

Ref: DDOC AD0179

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD AGENT AND SUPERVISOR POSITION ID MEMBERS
Feature no	F6224

FEATURE SYNOPSIS

This feature associates an Agent Position ID (AGENT_POS_ID) number with the Electronic Telephone Set (ETS) of an agent position and a Supervisor Position ID (SUPR_POS_ID) number with the ETS of a supervisory position for the Management Report System (MGTRPT). Both ID numbers are implemented as part of the ACD basic package.

FEATURE DESCRIPTION

This feature assigns a unique sequential four digit identification number in the range 0001-9999 to the AGENT_POS_ID and SUPR_POS_ID when 'Y' is entered for IDNUM (ID number) during INCALLS key and SUPR key datafill. Each four digit number identifies the ETS of an agent or supervisory position.

If the ACD group has been assigned the MGTRPT option, the management report interface will send call processing and agent position event messages to the downstream (DS) processor.

Ref: DDOC BC1562

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD EMERGENCY KEY - ENHANCED
Feature no	F6538

FEATURE SYNOPSIS

This feature provides the capability for the ACD Emergency Key Feature to activate a recorder and the supervisor simultaneously.

FEATURE DESCRIPTION

This feature enables an ACD agent to conference in an ACD supervisor and/or an auxiliary device (eg. tape recorder) via a single key depression. The ACD supervisor would receive the call on his ACD Answer Emergency Key (AEMK), and the auxiliary device would be called like any single line oriented device.

If an Answer Emergency Key is being used, when the ACD Agent presses the Emergency Key (EMK) while active on a normal ACD call, a key designated as the AEMK on the ACD supervisor's set will ring and its associated lamp will flash. The supervisor can then press the AEMK key and be conferenced into the call.

If both the AEMK and auxiliary device are being used, both will ring and be conferenced into the call when answered. Both of these calls will ring for a maximum of thirty (30) seconds. If they are not answered in this time, the calls will be abandoned.

A LOG message will be output upon initial depression of the ACD EMK Key supplying additional information dealing with the call.

Ref: FDOC - AD0845

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD ENHANCED
Feature	ACD MULTI-STAGE QUEUE STATUS LAMP
Feature no	G0075

Synopsis

The Automatic Call Distribution Multi-Stage Queue Status feature allows a customer to define three new queue thresholds for each Automatic Call Distribution (ACD) group. These three new thresholds can relate to either the time of the oldest call in the incoming call queue or to the call queue size.

This feature allows supervisors and agents to monitor how efficiently incoming calls are being handled.

Implementation

The thresholds are datafilled as part of the ACD group option Multi-Stage Queue Status (MSQS) in Table ACDGRP. Table ACDGRP has been modified to include a separate field for each of the thresholds levels. A field, CHOICE, has also been added to indicate whether the threshold is based on the time of the oldest call or the call queue size.

An audit process, running at a fixed time interval, determines which, if any, of the three thresholds have been exceeded. If one of the thresholds has been exceeded, the audit process implements any or all of the monitoring methods selected by the customer.

The following methods of monitoring the status of the queue threshold are available to the customer:

- * Operation of a Signal Distribution (SD) point located on a Maintenance Trunk Module (MTM) or an Office Alarm Unit (OAU)
- * Automatic display to an ACD agent's position
- * A Display Queue Threshold (DQT) key on an ACD agent's or supervisor's set

These options can be used separately or together.

To operate SD points on an MTM or OAU, the SDSEL field in Table ACDGRP is datafilled with Y. The SD points and the threshold levels associated with them are also datafilled in Table ACDGRP. The SD points associated with this feature are wired to an external, colored status lamp display.

To have the current queue threshold displayed on the agent's display field DISPSEL in Table ACDGRP is datafilled with Y.

To add a Display Queue Threshold key on an ACD agent's or supervisor's set, the new feature key DQT is datafilled in Table KSETFEAT.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX102AA IBN Station Message Detail Recording
NTX106AA IBN Proprietary Business Set
NTX415AA ACD Base
NTX901AA Local Features I
NTX407AA ACD Call Processing Control
or NTX407AB ACD Call Processing

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature interacts with the following features:

- * Reason Display
- * ACD Called Name/Called Number
- * Queue Status Lamp.

When both the Reason and ACD Multi-Stage Queue Status features are assigned, the ACD Multi-Stage Queue Status feature takes precedence over the Reason display unless the reason is displayed on the top line.

When both ACD Called Name/Called Number Display feature and ACD Multi-Stage Queue Status are assigned to an ACD group, the following rules apply:

- * ACD-DN name, number and threshold are displayed if space permits
- * If ACD-DN name, number and threshold do not fit, only ACD-DN name and number are displayed
- * If ACD-DN name and number do not fit, only the ACD-DN name is displayed.

The Multi-Stage Queue Status feature and the Queue Status Lamp feature cannot be assigned to the same ACD group.

Restrictions

Threshold values must be in the range 5 to 2400 units.

The low threshold must be less than the intermediate threshold, which must be less than the high threshold.

There must be at least five units between thresholds.

All thresholds must be datafilled.

If SDSEL is set to Y, then three SD points must be datafilled.

SD points must be unique and not used in conjunction with other features.

SD points must be assigned in Table SDGRP before being added to the MSQS option in Table ACDGRP.

The only valid selections for the CHOICE field are WAIT or CALLQ.

Only the NT4X20, M5209, and M5312 display sets are supported for agent display and Display Queue Threshold key.

The MSQS option must first be assigned to the ACD agent's or supervisor's ACD group before assigning DQT keys.

An ACD agent may have only one DQT key.

Reference

FDOC AD1129

Package	NTX416AC01 ACD ENHANCED II(UPG. OF NTX416AB)
Feature set	ACD
Feature	ACD CALLED NAME/NUMBER DISPLAY
Feature no	G0089

Synopsis

The Automatic Call Distribution (ACD) Called Name/Called Number Display feature displays the name and number of the called party on the bottom line of an agent's Electronic Business Set (EBS).

Implementation

A new option, ACDDISP, is added to Table ACDGRP to assign the ACD Name/Number Display feature on an ACD group basis. The Display Digits field, DISPDIGS, in Table ACDGRP is used to specify the number of ACD-DN digits to be displayed. The ACD-DN Name is datafilled in Table DNATTRS.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX102AA IBN Station Message Detail Recording
NTX106AA IBN Proprietary Business Set
NTX415AA ACD Basic
NTX901AA Local Features I
NTX407AA ACD Call Processing Control or
NTX407AB ACD Call Processing

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

The ACD Called Name/Called Number Display feature interacts with the following features:

- * Name Display
- * Reason Display
- * Multi-Stage Queue Status

* Call Transfer.

The ACD Called Name/Called Number Display feature and Name Display feature can both be assigned to a customer. The ACD group can be assigned the ACD Called Name/Number Display feature and the Customer group can be assigned the Name Display feature.

The ACD Called Name/Called Number Display feature and the Reason feature can both be assigned to a customer. The ACD group can be assigned the ACD Called Name/Number Display feature and the Customer group can be assigned the Reason feature. When both the Reason and the ACD Called Name/Number Display feature are assigned, the ACD Called Name/Number Display feature takes precedence over the Reason display.

All three features, ACD Called Name/Number Display, Name Display, and Reason can be assigned to a customer.

The ACD Called Name/Number Display feature and the Multi-Stage Queue Status feature, can both be assigned to an ACD group. When both features are assigned to an ACD group, the following rules apply:

- * ACD-DN name, number and threshold are displayed on the bottom line of the display, if space permits.
- * If ACD-DN name, number and threshold do not fit, only ACD-DN name and number are displayed,
- * If ACD-DN name and number do not fit, only the ACD-DN name is displayed.
- * The ACD Called Name/Number Display feature and the Call Transfer feature, can both be assigned to an ACD group.

Restrictions

The maximum length of the ACD-DN Name in Table DNATTRS is 15 characters. The maximum length of the ACD-DN Number is seven.

If both called name and number do not fit on the display, then only the called name will be displayed. If the called name is not datafilled in Table DNATTRS, then only the called number will be displayed.

The 2X16- and 2X24-character display sets are supported.

Reference

FDOC AD1131

Package	NTX418AA01 IBN_SERVICE ANALYSIS
Feature set	ADMINISTRATION
Feature	SERVICE ANALYSIS FOR IBN
Feature no	F3788

FEATURE SYNOPSIS

Service Analysis (SA) is a telephone observation system that is designed to appraise the quality of service provided by the Telco and its personnel. This is accomplished by monitoring, on a random basis, subscriber dialed, operator dialed, and operator assisted calls to evaluate the service being provided by a particular office and the surrounding switching network. Service analysis detects such problems as the misrouting of a call due to internal problems such as datafilling or poor quality of the talking connection due to transmission facilities.

Service Analysis is initiated and carried out by a Service Analyst who interacts with the DMS system. The analyst performs the Service Analysis functions by listening to calls and noting the events in a call as they occur.

FEATURE DESCRIPTION

Service analysis for IBN is intended as an add-on supplement to the existing service analysis software. Service analysis for IBN proposes to add and extend the type of calls to be analyzed for the IBN. This feature will allow the analyst to monitor:

1. IBN Lines

- a) Basic calls originated by IBN lines that terminate on lines or trunks in the office.
- b) In the case of flashes, SA for IBN will follow the same philosophy as POTS, i.e. if during a call, a line flashes to invoke an IBN feature the service analyst will be notified of the flash and the call will be disconnected from the service analysis MAP.
- c) Features that are excluded include universal call distribution, multi-appearance DN, programming custom calling features, feature use by access code and DISA.
- d) IBN line to attendant console is covered in the attendant console section.

2. IBN Trunk

- a) Basic calls incoming on an IBN trunk that terminate on

lines or trunks in the office.

- b) IBN trunk to attendant console is covered in the attendant console section.

3. Attendant Console

Even though the attendant console is connected to a line card it will be treated as a separate terminal type.

- a) Calls analysed include calls made to the attendant console and attendant extended calls.
- b) Calls that cause disconnection from the service analysis MAP include conference and call park.
- c) Calls specifically excluded include origination by an attendant console, attendant camp-on and call waiting.

NTX426AA01 Status: RTM ASYNCHRONOUS INTERFACE LINE CARD

MAINTENANCE	:	
ASYNC LINE CARD MAINTENANCE		F3873
FACILITIES	:	
ASYNCHRONOUS LINE CARD		F3991

Package	NTX426AA01 ASYNCHRONOUS INTERFACE LINE CARD
Feature set	MAINTENANCE
Feature	ASync LINE CARD MAINTENANCE
Feature no	F3873

FEATURE SYNOPSIS

This feature provides the maintenance for the asynchronous interface line card (AILC), 6X76AA.

FEATURE DESCRIPTION

The AILC contains a cut off relay, to isolate both the transmit and receive paths from the subscriber loop and connect these paths together for loop around. The following maintenance functions shall be supported:

- DIAGNostics
- Return to service
- BUSY
- Line cut off
- EQUIP
- CONNECT
- LOOPBACK

Since the AILC-AIM link does not support normal loop telephony signalling (eg: ringing, off hook), maintenance features that are specific to such an environment are not supported.

Package	NTX426AA01 ASYNCHRONOUS INTERFACE LINE CARD
Feature set	FACILITIES
Feature	ASYNCHRONOUS LINE CARD
Feature no	F3991

FEATURE SYNOPSIS

The asynchronous interface line card (AILC) forms a part of a data facility which is used to provide circuit switched data on the SL/DMS-100. The AILC is used in conjunction with an asynchronous interface module (AIM) to interface a user's DTE to the switch.

FEATURE DESCRIPTION

The AILC is mounted within an LCM line card drawer of the SL/DMS-100. It has a 4 wire RS422 interface to connect to the subscriber loop facility. An AIM connects to the other end of the 4 wire subscriber loop, and provides an RS232C interface to the users DTE.

The AILC line interface to the AIM provides asynchronous data transmission of ASCII coded characters at bit rates ranging from 110 bps to 19.2 kbps.

The AILC communicates with the SL/DMS-100 via the Bus Interface Card (BIC) of the LCM.

NTX427AA04 Status: RTM END USER TESTING OF TRUNKS

MAINTENANCE	:	
MAP ALARM LEVEL SCREENING		F3906
CUSTOMER SCREENING AT THE TTP		F3907
ADMINISTRATION	:	
NMP CUSTOMER SCREENING		F5711

Package	NTX427AA04 END USER TESTING OF TRUNKS
Feature set	MAINTENANCE
Feature	MAP ALARM LEVEL SCREENING
Feature no	F3906

FEATURE SYNOPSIS

This feature will allow customized trunk group alarms to be displayed at the remote MAPs located on the customer site. The alarms will be associated with the trunk groups owned by the customer and will exclude telco owned groups.

FEATURE DESCRIPTION

The feature introduces a top level alarm for the trunks subsystem, based on the trunks owned by the non telco user. The ownership feature allows a user to be specified as one of four USER CLASS. They are TELCO, GENERAL, OBSERVER and NON USER classes. A user with either of these last two classes shall not own any trunks. The only non telco USER CLASS supported is GENERAL.

The top level alarm shall be based on the trunks owned by the non telco user. It contains 2 fields. The first field is on row 0 and the second is on row 1.

For trunks, the trks sub system displays in the first field, the number of trunk groups in the highest alarm class, and that alarm class. The alarm class is a trunk group alarm class. From the lowest to the highest, the alarm class order is:

- no alarm
- group has man busy trunks
- group has ext busy trunks
- group has machine busy trunks
- group has exceeded it's minor alarm threshold
- group has exceeded it's major alarm threshold, and
- group has exceeded it's critical alarm threshold.

The second field contains the office alarm level that the trunk group alarm level causes. There are four levels of office alarm:

- no alarm
- minor alarm
- major alarm, and
- critical alarm.

The correlation between the alarms is given below:

TRUNK GROUP ALARM

OFFICE ALARM

No alarm	no alarm
Group has man busy trunks	no alarm
Group has ext made busy trunks	no alarm
Group has machine made busy trunks	no alarm
Group has exceeded minor alarm threshold	minor alarm
Group has exceeded major alarm threshold	major alarm
Group has exceeded critical alarm threshold	critical alarm

This feature shall only be applicable to non telco users. For telco MAP users, the normal top level display shall occur.

Reference:

FDOC BC1466

Package	NTX427AA04 END USER TESTING OF TRUNKS
Feature set	MAINTENANCE
Feature	CUSTOMER SCREENING AT THE TTP
Feature no	F3907

FEATURE SYNOPSIS

This feature allows command screening at the trunk test position to allow an IBN "owner/customer" to test his own facilities only. The aim is to allow centrex customers to maintain their own trunk facilities by providing at the customer location.

FEATURE DESCRIPTION

The feature allows the Telco to provide TTP's (trunk test positions) to their centrex customers by introducing command screening within the TTP. Centrex customers will not be allowed to access resources belonging to other parties. This will be done by the "enhanced command screening" feature.

The customer network data changes will allow the telco to specify which trunks belong to a given centrex customer. The TTP of a centrex customer is screened to show trunks belonging to that customer. Top level switch alarms will not be visible from the customers TTP.

Reference: FDOC BC1467

NTX430AA02 Status: RTM ESN

ESN	:	
ESN - NETWORK WIDE AUTOMATIC ROUTE SELECTION		F0757
ESN - NETWORK CLASS OF SERVICE		F1185
ESN - NETWORK INFORMATION SIGNALS		F1753

Package	NTX430AA02 ESN
Feature set	ESN
Feature	ESN - NETWORK WIDE AUTOMATIC ROUTE SELECTION
Feature no	F0757

SYNOPSIS ESN Network Automatic Route Selection (NARS) is a means of making effective use of the available network resources through the use of routing strategies such as Tail End/Head End Hop Off (TEHO/HEHO), Access to Specialized Common Carriers (SCC), Time-of-Day (TOD) Routing, and Alternate Route on Overflow (ARO). GENERAL DESCRIPTION The Electronic Switched Network (ESN) is a business communications network consisting of a number of nodes, usually intelligent PBXs, which are accessible to each other through on-net links, and which also have access to the public network and to specialized common carriers.

In the SL-100/DMS-100 context, ESN is an extension of the IBN (Integrated Business Network) environment to provide access to other nodes and to the public network.

Network Automatic Route Selection (NARS) provides least-cost routing to any on-net or off-net location using any suitable combination of on-net and off-net resources. The route taken is transparent to the user and not directly dependent on the digits dialled.

Package NTX430AA02 ESN
 Feature set ESN
 Feature ESN - NETWORK CLASS OF SERVICE
 Feature no F1185

GENERAL DESCRIPTION

This feature allows flexible screening and mapping of class-of-service values in an IBN switch. Data fill will define a number of COS mapping functions, each one capable of screening and / or altering class-of-service values.

FEATURE USE

This feature was created to support several other IBN features. It is required in a load only when one or more of the features that use it are in the load. This feature is used by several new IBN features, and could be retro-fitted to add consistency to other existing features. It is applicable anywhere requirements call for a change in NCOS value, or for screening based on NCOS value. For example, the Network Speed Call feature, V0781, must treat each originator in one of several different ways, depending on what value of NCOS was associated with his call. The following is a hypothetical set of requirements for a speed call list entry:

Original NCOS -----	Desired Result -----
3, 4	Allow call to proceed with new NCOS value of 7.
5-37, 94	Allow call to proceed with new NCOS value of 8
all others	Route call to treatment

This feature is also used by feature V0789, Network Information Signals. Incoming calls that use ESN proprietary signalling will contain a 1- or 2-digit class-of-service value in the impuled digits. This value will be mapped into an appropriate IBN NCOS value before the call is processed. The same operation will be reversed when an outgoing call uses ESN proprietary signalling: the IBN NCOS of the call will be mapped into a 1- or 2-digit value for outpulsing to the next switch. More detail will be found in the DID for feature V0789.

us FEATURE OPERATION

A simple utility program will be provided to perform class of service mappings. The meaning of each mapping will depend on the feature that uses it. For example, Network Speed Calling uses mappings to reject some calls based on their NCOS values, and to alter the NCOS of those calls that are not rejected.

The mapping utility is given two parameters, a mapping id, and an NCOS. The first parameter is similar to a translator id: it specifies which mapping to use. The second parameter is the NCOS to be mapped.

The mapping utility returns two values, a screening result, and a mapping result. The screening result is a "pass" or "fail" indication based on whatever screening criteria were data filled for the mapping. The mapping result is a number that was data filled against the given NCOS in the given mapping. Network Speed Calling uses the screening result to allow or reject the current call, and it uses the mapping result as the new NCOS value for calls that are not screened out.

Please note that whenever the screening result is "fail", the given NCOS is returned as the mapping result.

Examples of COS Mappings

The following are descriptions of mapping functions that could be implemented by using appropriate data fill with this feature.

Example 1

NCOS ----	Screening Result -----	Mapping Result -----
2	Pass	2
57	Pass	102
105	Pass	4
others	Fail	N/A

Example 2

NCOS ----	Screening Result -----	Mapping Result -----
7	Fail	N/A

9	Fail	N/A
others	Pass	same as original NCOS

Example 3

NCOS ----	Screening Result -----	Mapping Result -----
3	Pass	4
6	Pass	5
others	Pass	100

Example 4

NCOS ----	Screening Result -----	Mapping Result -----
95	Fail	N/A
102	Fail	N/A
others	Pass	90

Datafill for the above examples will be shown in a later section.

TABLE CONTROL

Two tables are used for this feature. A head table, COSMAP, identifies each class-of-service mapping, while a data table, COSDATA, lists the mapping and screening data for each mapping in COSMAP.

TABLE COSMAP

This table has one entry for each different mapping. Each entry contains a mapping name and the following data fields:

* MAX - the maximum value allowed for the mapping result. Example: Network Speed Calling uses the mapping result as the new NCOS value for the call. Numbers bigger than 255 are not valid NCOS values. Therefore COSMAP entries for Network Speed Calling would specify a MAX of 255, thereby preventing accidental datafilling of invalid NCOS values in the mapping.

* SCREEN - the type of screening to be done on the original NCOS by the mapping (see below)

* VALTYPE - restrictions that the user may place on the mapping results (see below)

TABLE CONTROL RESTRICTIONS

When changes or deletions are made to table COSMAP, the following restrictions will apply.

* The VALTYPE field may not be altered. The prospects of ensuring that all COSDATA entries for an existing mapping satisfy a new VALTYPE, or of altering all the COSDATA entries to force them to satisfy a new VALTYPE are not appealing. If VALTYPE must be changed, then a new mapping will have to be datafilled.

* For the same reasons, changing the MAX field in table COSMAP will not be allowed.

* When a COSMAP entry is deleted, all associated COSDATA entries will be deleted.

Package	NTX430AA02 ESN
Feature set	ESN
Feature	ESN - NETWORK INFORMATION SIGNALS
Feature no	F1753

FEATURE DESCRIPTION

ESN (Electronic Switched Network) is Northern Telecom's network network offering to business customers.

One of the major characteristics of ESN is the Network Information Signaling scheme. This signaling scheme is used exclusively

1. between switches equipped with the ESN Signaling package and
2. within a customer's private network.

ESN also provides for compatibility with ETN equipped switches. ETN (Electronic Tandem Network) is an AT & T network offering.

ESN Network Information Signaling will provide signaling compatibility between DMS-100/SL-100 and:

- an SL-1 switch functioning as an ESN Main
- an SL-1 switch functioning as an ESN Node
- an ETN switch
- a conventional PBX (existing capability)

ESN uses a proprietary form of DTMF signaling between ESN Mains and ESN Nodes. However, the information contained in the message (digit string) differs depending on whether the call is from an ESN Main to a Node or from a Node to a ESN Main. The format for Node to Node and Node to ETN can be the same.

The format from ETN to an ESN Node is the same as from an ESN Node to ETN. However, the digit string impulsed from the ETN can be in DP or DTMF.

DMS-100/SL-100 will be capable of supporting all of the Network Information Signals described in this document, regardless of whether DMS/SL-100 serves as a Main or as a Node.

Prior knowledge is required of the reader for this document. This includes:

- NTP 297-2101-451 for IBN Trunk Group and Sub Group Data, IBN Customer Group Data and Routing.

- V0509 - Simplified Dialing
- V0542 - Call Back Queuing
- V0785 - ESN CBQ
- V0463 - Station Message Detail Recording
- V0779 - ESN NCOS
- C0469 - NCOS Data
- V0494 - Authorization Codes
- V0783 - ESN Authorization Codes
- V0908 - Dial Tone Upon Trunk Seizure
- V0787 - ESN Tone Detection

FEATURE REQUIREMENTS DMS-100/SL-100 will be able to serve as both a Node and a Main in an ESN Network. Software will not differ for these functions.

ESN Network Information Signaling formats, both impulsed and outpulsed, are applicable to IBN trunks groups only.

For fast call set up purposes, ESN Network Information Signaling is usually DTMF. However, SL-1 is also capable of supporting DP (impulsing and outpulsing) for these formats. DMS-100/SL-100 will also be capable of both DP and DTMF for ESN Signaling formats.

DMS-100/SL-100 will also be capable of receiving and outpulsing the Proprietary signaling formats in MF.

Note: a maximum of 13 digits in MF may be outpulsed.

Translation of the digit string received, be it ESN or ETN, will be based on the DMS-100/SL-100 internal IBN NCOS assigned to the incoming trunk group. Each NCOS (one for ESN, one for ETN) must have its own preliminary translator. This is a protocol translator. There is a separate translator for the called number digit string which is selected based on the protocol digit manipulator.

Note: there are 1023 translators.

A new table, call PACMAN (Protocol Analysis and Code MANipulation) will be used to interpret the ESN Call Types and Sub Call Types for incoming calls. To index PACMAN, a new selector is required in the IBN Translator. PACMAN will be data driven and should not be used to decipher address dig-

its. PACMAN also picks up digit sequences for NCOS and TCOS and any other fields which may be datafilled.

Note: datafill errors can result in the misinterpretation of the incoming digit string. Traver can be used to verify this datafill.

For outgoing and tandem calls, digit manipulation (table DIGMAN), will be used. Please refer to V0509 - Simplified Dialing for details. Digit manipulation will be used to insert the appropriate digits for Call Type and Sub Call Type and NCOS and TCOS fields.

Note: for incoming, outgoing and tandem calls, the customer will be provided with a very flexible tool. The customer can datafill the meaning of digit strings, regardless of the network.

There is a SAT (satellite) field in both POTS and IBN trunk subgroup data. For tandem calls, if the ESN Network Information digit string received indicates SAT, this will be used to determine valid outgoing routing, even if the SAT bit is not set for the incoming trunk subgroup. If the SAT bit is set and the incoming ESN digit string does not indicate SAT, the SAT field will be the arbitrator and will determine the call routing and ESN Network Information format to be outputted to the next office. This assumes ESN signaling formats are applicable to the outgoing route. In addition, there will be a callchr (call characteristics) field defined for IBN trunks which will also contain a SAT bit. The algorithm for SAT indication will use all of this information.

DMS-100/SL-100 IBN at present supports 256 NCOS values per Customer group. A table is required to map these 256 NCOS values down to the 16 ESN NCOS values that will be outputted into the ESN Network. This table must be datafilled by the customer. The name of the table will be COSMAP (Class Of Service MAPPING).

A separate mapping is required for NCOS to TCOS. Again, this table will be datafilled by the customer. This table will be a mapping of the 256 IBN NCOS values down to 8 TCOS values. These 8 TCOS values will be used whenever format 2 or 5 are to be transmitted or received.

In summary, all information signals received and outputted must be mapped into an IBN NCOS.

Since an "ESN Type" NCOS will be assigned to an IBN incoming trunk group, it will be the responsibility of the translator which called the correct PACMAN procedure to determine the meaning of the Call_type and determine whether it is NCOS or TCOS related. This will also determine the length of part of the received digit string.

Although the previously defined formats rigidly adhere to a single digit Call Type and Sub Call Type, both must be developed, from the beginning, to permit 2 digits. SL-1 allows for this eventual expansion. Due to the

nature of DMS (CO based and PBX), this capability must be available in BCS12

NTX431AA03 Status: RTM IBN - CUT THROUGH DIALING

IBN	:	
CUT THROUGH DIALING		F1623
CUT THROUGH DIALING FOR IBN LINES AND A/C		F3792

Package	NTX431AA03 IBN - CUT THROUGH DIALING
Feature set	IBN
Feature	CUT THROUGH DIALLING
Feature no	F1623

FEATURE DESCRIPTION

The Cut-Through Dialing feature allows one or more cut through operations during dialing. DMS-100 recognizes the first set of incoming digits as an access code to activate the cut through feature and to select an outgoing trunk. The outgoing trunk can be either a POTS or an IBN trunk. A connection between the originator and the outgoing trunk is established to allow the call progression tones to be passed to the calling party. After this, the incoming PM (Peripheral Module) collects dialed digits one by one and sends them to CC (Central Control) which in turn sends the digits to the outgoing PM to output. The cut through operation ends under following conditions

1. The originating PM has send an end of dialing signal and all the dialed digits have been output. The end of dialing is indicated by either an # (on a DTMF set and Attendant console) or timeout (for all types of origination). The timeout period can be data filled and can be different for each customer group. It can vary from 4 to 10 seconds. The timeout period should be large enough to have sufficient time between dialing digits. For no answer type of out going trunks, the timeout period should be small enough to reduce the silence period from originator to terminator just after the cut through call has been answered. Also, if a user wants to insert ³s to indicate pauses in between the dialled digits, the timeout period should be larger than the pause time.
2. All the dialled digits has been output and an answer from the far end is received while waiting for the incoming PM to timeout.
3. The calling party abandons the call.

The dialed digits can be recorded for SMDR purposes.

Package	NTX431AA03 IBN - CUT THROUGH DIALING
Feature set	IBN
Feature	CUT THROUGH DIALING FOR IBN LINES AND A/C
Feature no	F3792

FEATURE SYNOPSIS

This feature allows cut through dialing for the 500/2500 sets, Attendant Consoles, Trunks, P-phones and Data units served by the new peripherals.

FEATURE DESCRIPTION

The cut through dialing feature allows one or more cut through operations during dialing. The switch translates the first set of digit(s) dialed by the user (the access code) and selects an outgoing trunk. A connection between the originator and the outgoing trunk is established. This connection will allow call progress tones (dial tone, etc) to be passed from any switches beyond the DMS to the user, after which the user can resume dialing. After cut through digits are collected and then outpulsed from the outgoing trunk one by one. Digit collection ends after an # is received or a data fillable timeout.

Cut through dialing is a non senderised mode of operation. This is due to the fact that digits are not collectively received and translated but merely relayed one by one through the switch. Cut through dialing is presently available on DP routes only.

Package	NTX432AA01 NETWORK SPEED CALLING
Feature set	ESN
Feature	NETWORK SPEED CALLING
Feature no	F1750

General Description

Primary Reference

The following is a direct quote from the ESN Commercial Specification (reference 1):

Each ESN switch will provide at least 1000 Network Speed Call numbers which can be assigned to on-net or off-net numbers by the man-machine interface facility. ESN will support a mixture of 2 and 3 digit speed numbers plus access code. A suggested dialing plan for speed numbers would be:

1MXX
1RX

where M = 1 thru 0, R = 1 thru 0, R & M cannot conflict.

Network speed numbers shall have priority and restriction classmarks available so that low priority users can have their calling class upgraded for pre-programmed business destinations. Regular station speed calling numbers will not have network class marks. Calls placed using station speed calling will use the network class of service assigned to the originator. It shall be possible to program a network speed number into a personal speed call list, and have the call treated as if it were completely dialed.

CLARIFICATION FOR SL-100 NETWORK SPEED CALL

This section elaborates on the above excerpt within the context of SL-100.

ACCESS CODES 1MXX, 1RX

SL-100 already supports flexible access codes, defined by the customer through datafill, for IBN features. The two suggested access codes, namely "1MXX" and "1RX", are only a subset of what is possible.

The access code for Network Speed Call is followed by the "cell" number to indicate which speed call number is desired.

Access codes are implemented through IBN translation, using table IBNXLA. The speed call "cell" number itself can be handled as an access code from the viewpoint of translation.

Different customer groups may have different translators, and hence different access codes.

This is an existing IBN capability and requires no new development.

STATION SPEED CALL

IBN Stations have access to personal speed calling lists through the following existing line options:

- Speed Call Short List
- Speed Call Long List 30
- Speed Call Long List 50
- Speed Call Long List 70

Speed Call Usage is indicated by dialling an asterisk (or a sequence of digits defined to be a "star equivalent") and then the speed call cell number⁴.

Attendants also have access to their own speed call lists, through the use of a special function key.

An IBN station user may store any digit sequence desired into a speed call list. The sequence is limited in length and cannot contain an octothorpe (because octothorpe would signal the end of the speed call programming sequence) but within these restrictions anything is acceptable.

An access code, for example, may be entered into a speed call list and will be processed correctly when the speed call entry is accessed. Since network speed call is invoked by access code, this existing capability automatically makes it possible to program a network speed call number into one's personal speed call list.

This is an existing IBN capability and requires no new development.

⁴ The exception to this is that an asterisk followed by digits can also indicate an access code which has been datafilled in the applicable **feature translator**. Speed Call usage is subordinate to such feature access codes. Thus, if the digits "23" have been datafilled in the feature translator, then the dialling sequence "*"23" is interpreted as the use of that access code, and not as speed call usage. If "23" is not datafilled, then "*"23" reverts to its default meaning of speed call usage. In the SL-100 application, this is sometimes referred to as Speed Call "cell stealing".

It is possible, in some cases, for NSC to invoke station speed calling. This is discussed along with other Feature Interactions later in the document.

PRIORITY AND RESTRICTION CLASSMARKS

SL-100 employs a **Network Class of Service** (NCOS) to control the calling privileges of users. (Refer to C0469 for details.)

A Pretranslator and a Feature Translator can be associated with an NCOS in order to provide special access codes (or to block use of certain access codes) for a group of users. The code restriction level is also implied by the NCOS. Trunks are assigned NCOS to control calling privileges. These uses of NCOS are existing capabilities.

SL-100 can exchange class of service information with other ESN nodes (ref: V0789, ESN - Network Information Signals). Upon receiving such information from another node, SL-100 transforms it into an NCOS for internal handling of the call. For calls from SL-100 to other ESN nodes, the NCOS is used to derive appropriate class of service information which accompanies the call. (These uses of NCOS are new and require development.)

For SL-100 Network Speed Call, the NCOS associated with a call conveys all the information relating to "priority" and "restrictions". If it is necessary to increase a station's calling privileges while completing a call placed via Network Speed Call, then this will be accomplished by altering the NCOS to give one which has the necessary privileges. This is discussed in more detail under -- Heading id 'NCOS1' unknown -- and -- Heading id 'NCOS2' unknown --.

CAPACITY

SL-100 Network Speed Call provides at least 1000 Network Speed Call numbers per customer group. There is no explicit limit on the number of Network Speed Call numbers per SL-100 switch. Each of the 128 customer groups can define the full 1000 numbers, provided the office is configured with sufficient data store.

Depending on the type of translation selectors used in implementing the Network Speed Call list, the customer may be able to define more than the 1000 per customer group.

SL-100 will accommodate the full 1000 numbers per customer group on the assumption that all use the new translation selector devised for Network Speed Call.

The size limitation with this selector (1000 entries per customer group) is the size of a table which it references.

Package	NTX433AA01 TIME OF DAY ROUTING
Feature set	ROUTING
Feature	TIME OF DAY ROUTING
Feature no	F1183

BACKGROUND

Time-of-Day Routing allows cost-effective use of facilities available by allowing or denying route choices based on the time of day. The times can be set according to the rate schedules of the carriers (public network and other common carriers) accessible to the user. The routes can also be varied based on the day of the week or the day of the year, to account for weekends and holidays.

REQUIREMENTS

In order to provide the most cost-effective routing in ESN, route lists must allow variable routing as a function of time of day. It must be possible to define different results for the same times on different days of the week, or days of the year.

SPECIFIC NEEDS

Among the features ESN will provide, is "looking ahead" at what the other networks (POTS, SCC, etc) will do once you have passed them control, and deciding if we (the private network) can do any better (cheaper, better service, etc) by going "on net" or via another network. To accomplish this, we will have to be able to provide a TOD system for each network that we will be interfacing with, so that we may accurately determine where their TOD routing would take us. Since TOD schemes vary between networks, we should provide a separate system for each (type of) user.

Package	NTX434AA01 TIME OF DAY NCOS
Feature set	ROUTING
Feature	TIME OF DAY NCOS
Feature no	F1767

GENERAL DESCRIPTION

This feature provides the capability of mapping normal class-of-service values into new values based on the time of day or day of year and the capability for conditional routing based on Network Class of Service.

FEATURE USE

This feature is applicable anywhere requirements call for a time-dependent network class of service (NCOS). For example, a customer may want to impose a more restrictive NCOS on calls made after normal business hours (eg. after 6 pm, on weekends).

Conditional routing based on NCOS allows flexible screening of class-of-service values at the routing stage of a call. For example, calls having a more restrictive NCOS could be routed to treatment, while calls having a less restrictive NCOS would be routed over a particular trunk group. This result is achieved by using one translator; no extra translators are needed to perform the screening.

This feature is optionally assigned to a customer group.

FEATURE OPERATION

Whenever NCOS data is to be examined, a time-of-day (TOD) NCOS utility is employed to determine what NCOS data to use at that specific time. The call's actual NCOS value is not altered.

A simple utility program performs the time-of-day NCOS mappings. The utility is given three parameters: a Time-of-Day NCOS option indicator, the customer's Time-of-Day NCOS system name, and an NCOS. The first parameter indicates whether or not the Time-of-Day NCOS option has been datafilled for this customer group; the second parameter is required in order to query the general TOD system (ref V1136). The third parameter is the NCOS to be mapped. The utility returns a time-of-day NCOS.

The actual time-of-day data for the Time-of-Day NCOS system is datafilled in the time-of-day tables TODHEAD, DAYTYPES, DAYOWEEK, DAYOYEAR, and TIMEODAY. A description of these tables can be found in the FDOC for feature V1136.

Conditional routing based on NCOS is datafilled in the IBNRTE table. The specified class-of-service mapping is performed on the call's original NCOS; the screening result produced by the mapping is an "allow" or "dis-

allow" indication of whether or not the specified route type is to be taken. Note that the class-of-service mapping is performed on the call's TOD NCOS instead of its original NCOS if the TOD NCOS feature has been datafilled.

FEATURE INTERACTION

This feature affects all features that employ Network Class of Service (NCOS).

In feature V0789 (Network Information Signals), class-of-service values are mapped before being outputted in the signalling protocol to another switch. In this situation, the class-of-service mapping is never performed on the call's TOD NCOS, even if the TOD NCOS feature has been datafilled. This restriction is necessary as it would be too confusing to extend the TOD variance across switches.

NTX435AA02 Status: RTM IBN SUPERSET

STATION FEATURES	:	
DIAL - CALL WAITING		F3484
CALL HOLD		F3485
CALL WAITING - ORIGINATING		F3486
DIRECTED CALL PICK-UP - BARGE IN		F3487
DIRECTED CALL PICK-UP - NON BARGE IN		F3488
STATION ACTIVATED DND WITH FEATURE ACTIVE REMINDER		F3782
DISTINCTIVE CALL WAITING TONES		F3783

Package	NTX435AA02 IBN SUPERSET
Feature set	STATION FEATURES
Feature	DIAL - CALL WAITING
Feature no	F3484

FEATURE DESCRIPTION

Dial call waiting permits a station user to impose call waiting on a busy station by dialling the call waiting feature activation code followed by the station D N. If the called station is busy, the caller will be call waited. While call waited, the originator will hear either audible ringback tone, recorded announcement or music.

A scenario of feature operation:

- A attempts to call B; A hears busy tone - A hangs up, then goes off hook again - A dials the dial call waiting feature code and receives special dial tone - A then dials the DN of B - Call waiting is then imposed on B, provided B is still busy

Package	NTX435AA02 IBN SUPERSET
Feature set	STATION FEATURES
Feature	CALL HOLD
Feature no	F3485

FEATURE DESCRIPTION

The call hold is an optional feature available to an IBN user with a 500/2500 set. It allows the user to hold one call for any length of time provided neither party goes on hook. It is applied on a per line basis. Activation requires the use of a feature code to be dialled after switch-hook flash.

Feature operation: Two stations A & B are in talking state. Station A has the call hold option assigned. During the conversation A wishes to put B on hold, A flashes and receives special dial tone, the call hold feature code is dialled, confirmation tone followed by dial tone is heard by A.

A has 10 seconds to initiate a variety of events. To retrieve B, A will go off-hook.

Package	NTX435AA02 IBN SUPERSET
Feature set	STATION FEATURES
Feature	CALL WAITING - ORIGINATING
Feature no	F3486

FEATURE DESCRIPTION

Call Waiting Originating permits a station user to impose Call Waiting on a busy station. The decision to call wait the caller is based on the calling station being assigned this feature. While the originator is call waited either audible ring back tone, recorded announcement or music will be provided. This feature applies to intragroup calls only.

When an IBn line with the CWO feature calls a busy IBN line within the same customer group the caller hears audible ringing/recorded announcement/music instead of busy tone while the called party is informed via a special tone burst that a new call is attempting to reach him.

Package	NTX435AA02 IBN SUPERSET
Feature set	STATION FEATURES
Feature	DIRECTED CALL PICK-UP - BARGE IN
Feature no	F3487

FEATURE DESCRIPTION

The Directed Call Pick up Barge-In (DCBI) feature permits an IBN station to answer a call which is ringing on any other line within the same customer group and served by the same DMS switch.

If the called station has already answered the call by the time the instigating station has completed the pick up sequence, the instigating station may barge-in to the answered call and be connected into a three way call. This feature is available to an IBN user with either DP/DTMF or P-phone.

A new line option Directed Call Pick-up Barge-in Exempt (DCBX) will block any attempt by another station with DCBI to barge-in.

The station dials a feature code followed by the extension number of the ringing line.

Package	NTX435AA02 IBN SUPERSET
Feature set	STATION FEATURES
Feature	DIRECTED CALL PICK-UP - NON BARGE IN
Feature no	F3488

FEATURE DESCRIPTION

The Directed Call pick up non barge in feature permits an IBN station to answer a call which is ringing any other line within the same customer group and served by the same DMS switch. This feature is available to an IBN user with either DP/DTMF set or P-phone.

To answer a ringing set within the same customer group, the station dials the feature code assigned to directed call pick up followed by the extension number of the ringing line. The directed call pick up non barge in does not give the station barge in privileges.

Package	NTX435AA02 IBN SUPERSET
Feature set	STATION FEATURES
Feature	STATION ACTIVATED DND WITH FEATURE ACTIVE REMINDER
Feature no	F3782

FEATURE SYNOPSIS

This feature will allow the user to make his line appear busy to incoming calls. This is achieved by dialing a Make Set Busy (MSB) activation code. The line can be made available again to incoming calls by dialing the MSB deactivation code.

This feature can be activated from a business set p-phone by means of a key or an activation code but not both.

FEATURE DESCRIPTION

The MSB feature is assigned on a per line basis to IBN lines equipped with 500/2500 sets and also to individual directory number appearances on the SL-100 proprietary business set.

A line assigned MSB will activate the feature by dialing the MSB activation code. A confirmation tone will be returned if feature activation is successful. If MSB is already active when the activation code is dialed, confirmation tone will be returned anyway and the MSB feature will remain active.

While MSB is active, any external incoming call which would normally terminate on the line will be given the treatment specified in the data. If the customer did not specify a treatment then external calls will receive busy tone as the default treatment. Intragroup calls will always receive busy tone.

To deactivate the feature an MSB deactivation code must be dialed. MSB only activates terminating calls; the user set will still be able to place outgoing calls.

Package	NTX435AA02 IBN SUPERSET
Feature set	STATION FEATURES
Feature	DISTINCTIVE CALL WAITING TONES
Feature no	F3783

FEATURE SYNOPSIS

This feature applies to the IBN Call-Waiting tones. The station who has a party call-waited for him will be specifically informed as to whether the waiting party is external or internal to his customer group. This will be achieved by providing different tone cadences. This feature is applicable to 500/2500 sets only and does not apply to the Business Set.

FEATURE DESCRIPTION

Call waiting is a terminating line feature which allows a party that is external to the customer group to the terminating station to be call-waited on that station. If distinctive call-waiting tone is assigned as an option for the customer group, then the special distinctive cadence will be used to indicate that the waiting call is indeed external to the controller's customer group.

If call waiting intragroup is assigned to the terminating line feature, parties within the terminating station customer group can also be call-waited. In this case, the software must check to see if the call is external or internal to the terminating stations customer group. If external then the special distinctive call waiting tone is applied.

Two office parameters will be used to aid in the implementation of this feature. One will specify the length of a solid burst of call-waiting tone, while the other will be used to specify the cadence for a special two-burst distinctive tone.

Package NTX436AA01 IBN ENHANCED DIAL PLAN
 Feature set DIAL PLAN
 Feature MVP DIAL PLAN
 Feature no F3489

FEATURE SYNOPSIS

This feature permits a POTS type dial plan to be used by small business and multiline residence customers. The MVP Intercom feature allows for abbreviated (station to station) dialing within the MVP group. In addition to the above, MVP customers also have access to features such as call hold, call pickup, call transfer, conference, call waiting etc.

FEATURE DESCRIPTION

The following describes the MVP dial plan.

Call Type	Digits Dialed
1. Local calls outside the MVP group	NXX-XXXX. No prefix digit such as "9" is dialed (a)
2. Toll Calls - HNPA DDD	(1) NXX-XXXX (a,b,c)
- FNPA DDD	(1) NPA-NXX-XXXX (a,b,c)
- HNPA OA DDD	0+NXX-XXXX (a)
- FNPA OA DDD	0+NPA-NXX-XXXX(a)
- OPERATOR HANDLED	0- (a)
- SERVICE CODES	411,611,911,etc (a,c)
- IDDD	011+12D MAX (a)
- OA IDDD	01+12D MAX (a)
- INTERNATIONAL OPERATOR	010 (a)
3. Access to Station Features	
- 2500 sets	³ X(X)(X)(X) (a,d)
- p-phones	feature key+(digits) (a,f)
- DP equivalent	11X(X)(X) (a,d)
4. Station to Station Dialing	
- 2500 sets	#X(X)(X)(X) (e)
- p-phones	Intercom or Group Intercom or Abbreviated Dialing (g,h)
- 500 sets	see call type 1 (local calls outside customer group (a)
5. Access to Outwats, FX, Tie Trunks	Dialed as a local or (a) DDD call or by dialing ³ X(X)(X)+called number

Package	NTX437AA01 RANDOM CONDITIONAL ROUTING
Feature set	IBN
Feature	RANDOM CONDITIONAL ROUTING
Feature no	F3492

FEATURE DESCRIPTION -----

BACKGROUND

There are many situations in which the Telco or other switch operator wishes to distribute calls among a number of trunk groups in something other than serial order (i.e. first to A, then to B, ... then to Z.)

Among the first requirements for this feature is Equal Access; the requirement of the Telco to give the user access to all common carriers, not just the one in which the Telco has a stake (i.e. ATT Longlines, Trans Canada Telephone, etc). The Telco may be required to distribute calls evenly among all the Common Carriers which serve the destination.

REQUIREMENTS

This feature will allow the user to datafill (in the routing tables) the distribution of calls to various Common Carriers to the nearest one percent. This will allow for equal distribution of calls among the carriers or for recognition of trunk group size variances among the carriers.

See the DS section of this document for datafill examples.

FEATURE INTERACTION

This feature will be datafilled as a subselector to the CND and NOT selectors in routing tables. The datafill will be exactly analogous to that used for Time of Day routing, and other conditional routing subselectors. There is no true interaction of this feature with any other routing features, other than the interaction of route lists with Queueing. (See the documents on Queueing for this interaction.) Various forms of conditional routing (such as Random, TOD, etc) can be mixed (layered) to achieve any mix of routing. Use of one type of conditional routing does not preclude the use of other types in any way.

USE OF ERWT AND QUEUEING WITH RANDOM ROUTING

Expensive Route Warning Tone (ERWT) can be specified in the route selectors in the normal manner.

Typically, the cheap (non-expensive) routes would be datafilled first (with distribution of calls among the carriers via Random Routing), followed by the expensive routes (which would be marked for ERWT). The cheap and expensive routes may be separated by queue header (QH) selectors for off-hook queueing.

There is no reason why expensive routes cannot be included in the distribution; if a route marked "expensive" is encountered, ERWT tone would be applied in the normal manner.

ACCURACY OF PERCENTAGES

In an office with reasonable traffic, the percentage datafilled, and the actual percentage experienced in a reasonably sized sample space (1000 calls) should not vary by more than 1%.

The worst case scenario is an office in which only Random Routing calls are being made. If there is only one call in progress, and that caller repeatedly makes calls using the same route list, the total number of unique results is reduced to 16 of the possible 100 datafillable percentages. This would imply that the actual percentage may vary from the datafilled percentage by an average 4% in either direction. This would be a very rare occurrence and would probably only be encountered by someone trying out Random Routing in a non-in-service office. Naturally, this practice is discouraged for it would serve no purpose.

NTX445AB01 Status: RTM O.M. SELECTIVE OUTPUT (UPGRADE OF NTX445

ADMINISTRATION	:	
OM SELECTIVE PRINTOUT		F2578
OM - GROUP TOTALS		F2664

Package	NTX445AB01 O.M. SELECTIVE OUTPUT (UPGRADE OF NTX445AA)
Feature set	ADMINISTRATION
Feature	OM SELECTIVE PRINTOUT
Feature no	F2578

FEATURE SYNOPSIS

OM key selective printout feature will be able to schedule operational measurement data by selected tuple or a set of selected tuples rather than all tuples in any OM group printout (e.g. TRK, LMD, IBN).

This will alleviate the problem telco encounters in large offices where there is not enough print time to output all operational measurement scheduled data.

Feature Description

CI Command

There is a new CI module called 'OMACKEY' command, which will build into a new system called OMKEYSUB.

The function of OMACKEY command is to add or delete any selective tuple, which will build a boolean pattern to indicate the present of the tuple, for example, if I want a particular trkgrp called "RONI", scheduled to output, then the steps are:

```
>OMCLASS MYCLASS SINGLE
datafill table OMACC & OMPRT.
>OMACCTAB MYCLASS GROUP TRK ALLFIELDS
>OMACKEY MYCLASS TRK ADD RONI (or #)
```

In a case of only one tuple existed in a selected OM group (e.g. OFZ) OMACKEY will not have any impact to the output, the default will automatically output group OFZ when OM printout scheduled.

Prior to using OMACKEY command, the user should define a class by OMCLASS command, and select any OM group by OMACCTAB command.

Benefit

- a) Telco's administrator can monitor selective trunk group(s) that need special attention.
- b) Eliminate the long print time on operational measurement scheduled output.

CI COMMANDS AFFECTED - OMACKEY (new)

OVERVIEW

The function of OMACCKEY command is to add any selective tuple or delete all selected tuple(s) from a selected OM group. Prior to use OMACCKEY command, the user should define a class by OMCLASS command, and select any OM group by OMACCTAB command.

Command OMDUMP will dump the selected tuple, if they existed.

COMMANDS

COMMAND NAME - OMACCKEY

PARAMETERS

```
>q omacckey
create or delete an om selective tuple
Parms:<CLASS>(ACTIVE,
HOLDING,
classnames, etc.)
<GROUP> STRING
<FUNCTION>(ADD <KEY> (0 to 9999)
                <KEY> STRING)
DELETE)
```

EXAMPLES

```
44 define an OM class
>omclass myclass single

44 select OM groups
>omacctab myclass group tones allfields
OK

44 add/delete selected tuple to/from the OM group.
>omacckey myclass tones add 0
OK
omacckey myclass tones add 120TO
OK
>omacckey myclass tones delete
KEY DELETED
>omacckey myclass tones add 120TO
OK
>omacckey myclass ibn add 0
INVALID GROUP
>omacckey myclass rcvr add 0
TABLE NOT DEFINED
>omacckey myclass tones add 120TO
KEY ALREADY DEFINED
>omacckey myclass tones add 0 ^3 BUSY'
EITHER INTEGER OF STRING
>omacckey myclass tones add
```

```
MUST ENTER KEY
>omackey myclass tones add 12000
KEY TOO LARGE
```

For dump and restore purposes, the OMDUMP command has been modified as follows:

```
>omdump all commands
OMCLASS MYCLASS SINGLE
OMACCTAB MYCLASS GROUP TONES ALLFIELDS
OMACKEY MYCLASS TONES ADD 10
```

Package	NTX445AB01 O.M. SELECTIVE OUTPUT (UPGRADE OF NTX445AA)
Feature set	ADMINISTRATION
Feature	OM - GROUP TOTALS
Feature no	F2664

OM GROUP TOTALS (F2664/BR0664)FEATURE SYNOPSIS

The purpose of this feature is to add totals by register to a telco-defined selection of OM groups. These totals will appear as an extra tuple, visible on all OMPR reports and through the OMSHOW command. It will also be possible for the telco to threshold the values in these "total tuples" using the optional table OMTHRESH.

FEATURE DESCRIPTION

Because of the large number of tuples in certain OM groups, it has become desirable for the OM system to generate totals of the counts for each register across all tuples of these groups. There are three main uses for these totals:

1. In OMPR reports, to summarize the data presented. Totals for selected groups will appear at the end of the display for each group in a format similar to that of the other tuples; for accumulation classes where key selection is in use, the totals will be over all tuples, including those not shown, but no totals will appear for fields deselected from such classes. The OM tape output format will not be affected by this feature.
2. At the man-machine interface, to allow the craftsman to get a larger picture of activity within certain areas of the system without the need to perform mental arithmetic. For example, the CI command "OMSHOW TRK ACTIVE" would show all tuples in the ACTIVE class table of group TRK including the totals, while "OMSHOW TRK ACTIVE TOTAL" would show only the "total tuple".
3. To enable the telco to place thresholds on the rate of increase of registers within certain OM groups across all tuples, using the optional table OMTHRESH. For example, the telco could place a threshold on the number of pegs in GLARE registers in group TRK, regardless of which trunk group(s) experienced glare, by adding a tuple with key GLARE TOTAL to table OMTHRESH.

Totalling for OM groups will be turned on and off using a new CI command OMTOTAL similar to commands presently used to define the parameters of accumulation classes. This command may be used to achieve totalling effects on a temporary or permanent basis.

OM group totals will always be computed on the basis of data found at the time of the report, so that they will always agree with the data they accompany except, as mentioned above, where accumulation key selection is in use. This means that totals displayed for an accumulation class of a certain OM group might be less than the sum of the totals displayed in reports showing figures which contributed to that class if tuples were removed, or the table reallocated, during the accumulation period.

NTX455AA01 Status: A+M 1A EADAS NETWORK MANAGEMENT(UPG. BY NTX4

INTERFACES	:	
1A/1B EADAS/NM - BX.25 INTERFACE		F2691
ADMINISTRATION	:	
EADAS/NM - ADMINISTRATION AND OPERATION		F3983

Package	NTX455AA01 1A EADAS NETWORK MANAGEMENT(UPG. BY NTX455AB)
Feature set	INTERFACES
Feature	1A/1B EADAS/NM - BX.25 INTERFACE
Feature no	F2691

FEATURE SYNOPSIS

This feature documents Phase I of the EADAS/NM project. EADAS/NM is an operational support system which provides a telco's network managers with traffic measurements and control capabilities for the telco's network of telephone switches. The DMS-100F responds to the EADAS/NM 5 minute pool, 30 second discrete poll and the related audits and commands. The 5 minute data provided to EADAS is obtained from a subset of measurements in the DMS-100F operational measurement system. Audits and commands are used by EADAS in selecting which measurements are to be included in the 5 minute response message from the given set of measurements. 30 second discrete polls serve an alerting function to EADAS that the DMS database has changed.

FEATURE DESCRIPTION

EADAS/NM is an AT&T operational support system which provides network managers with real time surveillance and control of the switching network. Based on data collected every 5 minutes, the NM system can:

1. Keep the network of telephone switches operating near maximum efficiency.
2. Help the network maintain network integrity during overloads or facility failures.

EADAS/NM interfaces to telephone switches via the engineering and administrative data acquisition system (EADAS). EADAS performs an independent traffic data collection function as well as acting as a front end concentrator for EADAS/NM. The DMS-100F EADAS/DC feature maintains the datalink connection to EADAS which is also used by EADAS/NM. Groups of central offices are connected to EADAS centers which in turn connect to an EADAS/NM center. A datalink is established between a DMS-100F and an EADAS center via MPC and modems.

The categories of message types used by EADAS/NM are listed below.

- . NM control commands
- . 30 second discretetes
 - NM control status discretetes
 - database change alerting discretetes
- . 5 minute data
 - traffic data packets

- NM control data packets

- . Data scheduling commands
 - packet schedule
 - trunk group schedule

- . Audits
 - database audits
 - full (demand)
 - change

- . NM control audits
 - full (demand)
 - change

SCOPE OF THIS FEATURE

Phase I of EADAS/NM is limited to 5 minute data, the associated audits and schedule commands, and the 30 second discrettes which elicit these audits and commands from EADAS/NM.

The DMS-100F provides responses to the polls:

- . 30 second discrete request for database change alerting discrettes
- . 5 minute surveillance data request for traffic data packets

The DMS-100F provides responses to the full (demand) database audits:

- . trunk group reference data audit
- . trunk group list audit
- . interlata carrier (IC) data locations audit

The DMS-100F provides responses to 5 minute data schedule commands:

- . packet schedule command
- . trunk group schedule command

References:

BR0691, BC1410, BC1412, BC1413, BC1414

FDOC BR0555 (F2555), FDOC BC1365 (F3916), FDOC BC1382 (F5407), FDOC BC1366 (F3917), FDOC BC1370 (F3919), FDOC BC1334 (F3987), FDOC BC1335 (F3988), FDOC BC1336 (F3989).

Package	NTX455AA01 1A EADAS NETWORK MANAGEMENT(UPG. BY NTX455AB)
Feature set	ADMINISTRATION
Feature	EADAS/NM - ADMINISTRATION AND OPERATION
Feature no	F3983

EADAS/NM ADMINISTRATION AND OPERATION

FEATURE SYNOPSIS

This feature implement Phase I of the DMS-100 interface to EADAS/NM (Engineering Administration Data Acquisition System/Network Management). EADAS/NM is an Operational Support System which provides a telco's network managers with traffic measurements and control capabilities for the TELCO's network of telephone switches. Based on data collected every 5-minutes, the EADAS/NM system can:

- 1) Keep the network of telephone switches operating near maximum efficiency
- 2) Help the network maintain network integrity during overloads or facility failures.

This feature provides for the following:

- The ability to SET the alerting discrettes that make up the Network Management Control 30-second response message, the ability to transmit the 30-second response message, and the ability to RESET the alerting discrettes at the appropriate time.
- New Operational Measurements (OMs) that are required by the implementation of EADAS/NM INTERFACE-PHASE I. A new measurement for total trunk group usage, TOTU, is added to OM group TRK. An entirely new group, EASHRTRK, is also added containing three fields of traffic measurements for shared trunk groups.
- Packet Schedule Command, Trunk Group Schedule Command, Trunk Group List Audit, Trunk Group Reference Data Audit, and InterLATA Carrier Data Locations Audit.
- The implementation of the logical channel 2 of the datalink to EADAS for transmission of the 5-minute data.
- Possibility to execute the following through DMS-100 Tables:
 1. Query the Packet Schedule and the Trunk Group Schedule
 2. Make changes to the Packet Schedule
 3. Add, delete and make changes to the Trunk Group Schedule

and to show the transmit buffers for 30 second data and 5 minute data by having this capability added to the MAP command EADASHOW.

FEATURE DESCRIPTION

1. 30-second Discretes Handling

This is the capability to manipulate (set ON/OFF) the alerting discretes that are required by the EADAS/NM system, and to transmit the discretes to the EADAS/NM system in the form of a 30-second response message.

Discretes are one-bit ON/OFF status indicators. The EADAS/NM interface defines two types of discretes: status discretes and message alerting discretes. The discretes provided in EADAS/NM Phase I are limited to a subset of the message alerting discretes. These discretes provide an alerting function when a change in the 5-minute data occurs.

Every 30 seconds, EADAS/NM discrete data is polled from the DMS-100F by the EADAS system, and is transmitted to EADAS/NM via logical channel 1. The full complement of 64 discretes are transmitted in the response message body, but only 5 of those discretes are manipulated in Phase I implementation of the DMS-100F - EADAS/NM Interface. All discretes that are not pertinent to this implementation will always remain in the OFF state.

Message alerting discretes may be set ON as a result of the following actions.

- 1) Changes to the EADAS/NM reference data. This happens as a result of changes to certain tables resident on the DMS-100F switch.
- 2) Exception conditions at the DMS-100F which can cause the EADAS/NM schedule data to become suspect (eg. RESTART).

The alerting discretes will remain ON until the appropriate EADAS/NM response is received. That response will be in the form of an audit or command message.

2. Shared Trunk Group Traffic Measurements

The new measurements created by this feature fall into two categories. The first is a new total trunk group usage measurement, TOTU, which is added to OM group TRK (Trunk Group Measurements). The second is an entirely new OM group, EASHRTRK, which will contain three fields containing traffic measurements for shared trunk groups.

A shared trunk group is a trunk group between an Equal Access End Office (EAEO) and an Access Tandem (AT) which carries calls outgoing to or incoming from Interexchange Carriers (IECs). The trunk group is shared in the sense that it may carry calls to or from more than one IEC.

TRK TOTU is a new non-optional field created in OM group TRK which measures the total usage on a trunk group. It is the sum of the existing TRK

measurements TRU (TRaffic Usage), SBU (System Busy Usage), and MBU (Manual Busy Usage).

EASHRTRK is an optional OM group which contains traffic measurements for shared trunk groups. EASHRTRK consists of three fields:

- STGOPEG - Shared Trunk Group Outgoing Peg Count
- STGUSG - Shared Trunk Group Usage
- STGOVFL - Shared Trunk Group Overflows

3. Audit and Commands

The purpose of the audits is to ensure that the EADAS/NM databases are in agreement with the DMS-100F databases. The purpose of the commands is to allow the establishment and revision of the data schedules for five minute data. Both audits and commands are initiated by EADAS/NM through messages over logical channel 3 of the DMS-100F interface.

Audits are initiated by EADAS/NM at will, but often in response to the setting of related thirty second alerting discrettes. These in turn are set in response to changes to the DMS-100F databases. The data of interest are trunk group data (both scheduled and total) and carrier data. Only full (demand) audits are provided in Phase I.

The commands are initiated by EADAS/NM at will, but may be in response to the setting of the related thirty second schedule compromise discrettes. Commands allow modifications to the trunk group schedule and the packet schedule. Both of these concern five minute data.

COMMANDS

Two commands are provided: the Trunk Group Schedule Modification Command and the Packet Schedule Command. On receipt of a schedule command message from EADAS/NM, a thirty second alerting discrete is set to provoke an audit of the appropriate data. Only after the receipt of the correct audit request will changes to the schedule take effect.

The Trunk Group Schedule Modification Command makes changes to the list of trunk groups on which information is to be sent to EADAS/NM in packet 17 of the five minute data.

The Packet Schedule Command specifies which packets of the five minute data are to be sent in response to a poss from EADAS/NM.

AUDITS

Three audits are provided: Trunk Group List Audits, Trunk Group Reference Data Audits, and Interlata Carrier Data Locations Audits. On receipt of an Audit Request Message from EADAS/NM, the desired information is gathered from various tables in the DMS-100F and transmitted to EADAS/NM. Any associated schedules are updated and their discrettes are reset.

The Trunk Group List Audit provides information about the trunk groups in the DMS-100F.

The Trunk Group Reference Data Audit provides information only for those trunk groups that are in the Trunk Group Schedule.

The InterLATA Carrier Data Locations Audit provides information about the InterLATA Carriers that have shared trunk groups in the DMS-100F. A shared trunk group connects an equal access end office to an access tandem, and carries traffic for more than one carrier.

4. 5-Minute Data Transmission

The DMS-100F receives messages from EADAS and transmits messages to EADAS through the Multi-Protocol Controller (MPC) datalink. The datalink is divided into three logical channels of differing messaging priorities. The following messages are received by DMS-100F on logical channel 2:

- o 5-Minute Data Request
- o EADAS Planned Down Request

The following messages may be transmitted to EADAS by DMS-100F on logical channel 2:

- o Invalid Request Response
- o Time Conflict Response
- o 5-Minute Data Response

5. Man Machine Interface to 5-minute Data

Two new OM classes called PREV5M and CURR5M are defined through a command file during load building. These classes are at positions 4 and 5 in table OMACC and follow the three EADAS/DC classes. PREV5M and CURR5M contain the previous and current 5-minute snapshots of ACTIVE data. These classes get snapshots of part of the ACTIVE class data and should not be thought of as "accumulating" classes.

The OMCLASS and OMACCTAB commands must not be used on CURR5M or PREV5M after datafill. Also, the CURR5M and PREV5M tuples in table OMACC must not be changed from their datafilled values; the "when" field must remain "auto" and the "enable" field must remain "N."

The OM MMI commands, OMDUMP, OMSHOW, and OMACCKEY are unchanged in their operation on EADAS/NM OM classes. EADAS/NM class output to tape, disk, or printer can be scheduled in the same way as OM class output is scheduled. Note that output may only be scheduled on OMXFR time boundaries (15 or 30 min) and is therefore not possible after most snapshots because they happen every 5-minutes.

NTX455AB01 Status: RTM 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX

INTERFACES	:	
1A/1B EADAS/NM - BX.25 INTERFACE		F2691
ADMINISTRATION	:	
EADAS/NM - ADMINISTRATION AND OPERATION		F3983
30 SECOND DISCRETS ENHANCEMENT		F6028
TRUNK GROUP CONTROL IDENTIFIERS		F6249
EADAS/NM COMMAND INTERFACE		F6316
EADAS/NM AUDIT INTERFACE		F6317
EADAS/NM 5-MINUTE PACKET INTERFACE		F6318
CHANGED TRUNK GROUP RECORDING ABILITY		F6346

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	INTERFACES
Feature	1A/1B EADAS/NM - BX.25 INTERFACE
Feature no	F2691

FEATURE SYNOPSIS

This feature documents Phase I of the EADAS/NM project. EADAS/NM is an operational support system which provides a telco's network managers with traffic measurements and control capabilities for the telco's network of telephone switches. The DMS-100F responds to the EADAS/NM 5 minute pool, 30 second discrete poll and the related audits and commands. The 5 minute data provided to EADAS is obtained from a subset of measurements in the DMS-100F operational measurement system. Audits and commands are used by EADAS in selecting which measurements are to be included in the 5 minute response message from the given set of measurements. 30 second discrete polls serve an alerting function to EADAS that the DMS database has changed.

FEATURE DESCRIPTION

EADAS/NM is an AT&T operational support system which provides network managers with real time surveillance and control of the switching network. Based on data collected every 5 minutes, the NM system can:

1. Keep the network of telephone switches operating near maximum efficiency.
2. Help the network maintain network integrity during overloads or facility failures.

EADAS/NM interfaces to telephone switches via the engineering and administrative data acquisition system (EADAS). EADAS performs an independent traffic data collection function as well as acting as a front end concentrator for EADAS/NM. The DMS-100F EADAS/DC feature maintains the datalink connection to EADAS which is also used by EADAS/NM. Groups of central offices are connected to EADAS centers which in turn connect to an EADAS/NM center. A datalink is established between a DMS-100F and an EADAS center via MPC and modems.

The categories of message types used by EADAS/NM are listed below.

- . NM control commands
- . 30 second discretetes
 - NM control status discretetes
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- . 5 minute data
 - traffic data packets

- NM control data packets

- . Data scheduling commands
 - packet schedule
 - trunk group schedule

- . Audits
 - database audits
 - full (demand)
 - change

- . NM control audits
 - full (demand)
 - change

SCOPE OF THIS FEATURE

Phase I of EADAS/NM is limited to 5 minute data, the associated audits and schedule commands, and the 30 second discrettes which elicit these audits and commands from EADAS/NM.

The DMS-100F provides responses to the polls:

- . 30 second discrete request for database change alerting discrettes
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The DMS-100F provides responses to the full (demand) database audits:

- . trunk group reference data audit
- . trunk group list audit
- . interlata carrier (IC) data locations audit

The DMS-100F provides responses to 5 minute data schedule commands:

- . packet schedule command
- . trunk group schedule command

References:

BR0691, BC1410, BC1412, BC1413, BC1414

FDOC BR0555 (F2555), FDOC BC1365 (F3916), FDOC BC1382 (F5407), FDOC BC1366 (F3917), FDOC BC1370 (F3919), FDOC BC1334 (F3987), FDOC BC1335 (F3988), FDOC BC1336 (F3989).

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	ADMINISTRATION
Feature	EADAS/NM - ADMINISTRATION AND OPERATION
Feature no	F3983

EADAS/NM ADMINISTRATION AND OPERATION

FEATURE SYNOPSIS

This feature implement Phase I of the DMS-100 interface to EADAS/NM (Engineering Administration Data Acquisition System/Network Management). EADAS/NM is an Operational Support System which provides a telco's network managers with traffic measurements and control capabilities for the TELCO's network of telephone switches. Based on data collected every 5-minutes, the EADAS/NM system can:

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This feature provides for the following:

- The ability to SET the alerting discrettes that make up the Network Management Control 30-second response message, the ability to transmit the 30-second response message, and the ability to RESET the alerting discrettes at the appropriate time.
- New Operational Measurements (OMs) that are required by the implementation of EADAS/NM INTERFACE-PHASE I. A new measurement for total trunk group usage, TOTU, is added to OM group TRK. An entirely new group, EASHRTRK, is also added containing three fields of traffic measurements for shared trunk groups.
- Packet Schedule Command, Trunk Group Schedule Command, Trunk Group List Audit, Trunk Group Reference Data Audit, and InterLATA Carrier Data Locations Audit.
- The implementation of the logical channel 2 of the datalink to EADAS for transmission of the 5-minute data.
- Possibility to execute the following through DMS-100 Tables:
 1. Query the Packet Schedule and the Trunk Group Schedule
 2. Make changes to the Packet Schedule
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and to show the transmit buffers for 30 second data and 5 minute data by having this capability added to the MAP command EADASHOW.

FEATURE DESCRIPTION

1. 30-second Discretes Handling

This is the capability to manipulate (set ON/OFF) the alerting discretes that are required by the EADAS/NM system, and to transmit the discretes to the EADAS/NM system in the form of a 30-second response message.

Discretes are one-bit ON/OFF status indicators. The EADAS/NM interface defines two types of discretes: status discretes and message alerting discretes. The discretes provided in EADAS/NM Phase I are limited to a subset of the message alerting discretes. These discretes provide an alerting function when a change in the 5-minute data occurs.

Every 30 seconds, EADAS/NM discrete data is polled from the DMS-100F by the EADAS system, and is transmitted to EADAS/NM via logical channel 1. The full complement of 64 discretes are transmitted in the response message body, but only 5 of those discretes are manipulated in Phase I implementation of the DMS-100F - EADAS/NM Interface. All discretes that are not pertinent to this implementation will always remain in the OFF state.

Message alerting discretes may be set ON as a result of the following actions.

- 1) Changes to the EADAS/NM reference data. This happens as a result of changes to certain tables resident on the DMS-100F switch.
- 2) Exception conditions at the DMS-100F which can cause the EADAS/NM schedule data to become suspect (eg. RESTART).

The alerting discretes will remain ON until the appropriate EADAS/NM response is received. That response will be in the form of an audit or command message.

2. Shared Trunk Group Traffic Measurements

The new measurements created by this feature fall into two categories. The first is a new total trunk group usage measurement, TOTU, which is added to OM group TRK (Trunk Group Measurements). The second is an entirely new OM group, EASHRTRK, which will contain three fields. containing traffic measurements for shared trunk groups.

A shared trunk group is a trunk group between an Equal Access End Office (EAEO) and an Access Tandem (AT) which carries calls outgoing to or incoming from Interexchange Carriers (IECs). The trunk group is shared in the sense that it may carry calls to or from more than one IEC.

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measurements TRU (TRaffic Usage), SBU (System Busy Usage), and MBU (Manual Busy Usage).

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- STGOPEG - Shared Trunk Group Outgoing Peg Count
- STGUSG - Shared Trunk Group Usage
- STGOVFL - Shared Trunk Group Overflows

3. Audit and Commands

The purpose of the audits is to ensure that the EADAS/NM databases are in agreement with the DMS-100F databases. The purpose of the commands is to allow the establishment and revision of the data schedules for five minute data. Both audits and commands are initiated by EADAS/NM through messages over logical channel 3 of the DMS-100F interface.

Audits are initiated by EADAS/NM at will, but often in response to the setting of related thirty second alerting discretetes. These in turn are set in response to changes to the DMS-100F databases. The data of interest are trunk group data (both scheduled and total) and carrier data. Only full (demand) audits are provided in Phase I.

The commands are initiated by EADAS/NM at will, but may be in response to the setting of the related thirty second schedule compromise discretetes. Commands allow modifications to the trunk group schedule and the packet schedule. Both of these concern five minute data.

COMMANDS

Two commands are provided: the Trunk Group Schedule Modification Command and the Packet Schedule Command. On receipt of a schedule command message from EADAS/NM, a thirty second alerting discrete is set to provoke an audit of the appropriate data. Only after the receipt of the correct audit request will changes to the schedule take effect.

The Trunk Group Schedule Modification Command makes changes to the list of trunk groups on which information is to be sent to EADAS/NM in packet 17 of the five minute data.

The Packet Schedule Command specifies which packets of the five minute data are to be sent in response to a poss from EADAS/NM.

AUDITS

Three audits are provided: Trunk Group List Audits, Trunk Group Reference Data Audits, and Interlata Carrier Data Locations Audits. On receipt of an Audit Request Message from EADAS/NM, the desired information is gathered from various tables in the DMS-100F and transmitted to EADAS/NM. Any associated schedules are updated and their discretetes are reset.

The Trunk Group List Audit provides information about the trunk groups in the DMS-100F.

The Trunk Group Reference Data Audit provides information only for those trunk groups that are in the Trunk Group Schedule.

The InterLATA Carrier Data Locations Audit provides information about the InterLATA Carriers that have shared trunk groups in the DMS-100F. A shared trunk group connects an equal access end office to an access tandem, and carries traffic for more than one carrier.

4. 5-Minute Data Transmission

The DMS-100F receives messages from EADAS and transmits messages to EADAS through the Multi-Protocol Controller (MPC) datalink. The datalink is divided into three logical channels of differing messaging priorities. The following messages are received by DMS-100F on logical channel 2:

- o 5-Minute Data Request
- o EADAS Planned Down Request

The following messages may be transmitted to EADAS by DMS-100F on logical channel 2:

- o Invalid Request Response
- o Time Conflict Response
- o 5-Minute Data Response

5. Man Machine Interface to 5-minute Data

Two new OM classes called PREV5M and CURR5M are defined through a command file during load building. These classes are at positions 4 and 5 in table OMACC and follow the three EADAS/DC classes. PREV5M and CURR5M contain the previous and current 5-minute snapshots of ACTIVE data. These classes get snapshots of part of the ACTIVE class data and should not be thought of as "accumulating" classes.

The OMCLASS and OMACCTAB commands must not be used on CURR5M or PREV5M after datafill. Also, the CURR5M and PREV5M tuples in table OMACC must not be changed from their datafilled values; the "when" field must remain "auto" and the "enable" field must remain "N."

The OM MMI commands, OMDUMP, OMSHOW, and OMACCKEY are unchanged in their operation on EADAS/NM OM classes. EADAS/NM class output to tape, disk, or printer can be scheduled in the same way as OM class output is scheduled. Note that output may only be scheduled on OMXFR time boundaries (15 or 30 min) and is therefore not possible after most snapshots because they happen every 5-minutes.

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	ADMINISTRATION
Feature	30 SECOND DISCRETS ENHANCEMENT
Feature no	F6028

FEATURE SYNOPSIS

This feature provides the ability to set and reset the status and alerting discretes for EADAS/NM 30 second response message. This phase provides 9 new status discretes and 2 alerting discretes.

FEATURE DESCRIPTION

This feature manipulates 11 new discretes required by the EADAS/NM system. This feature introduces status discretes for the first time and therefore a mechanism is required to reset them.

The discretes are single bit on/off indicators representing the status of an event or alerting function. The status discrete provides an indication of system overload conditions or activation of network controls. Alerting discretes alert EADAS/NM when a change occurs to EADAS/NM data or upon exception conditions that can cause scheduling data to become suspect.

The EADAS/NM polls the DMS-100F every 30 seconds for its discrete data. The DMS-100F transmits a 30 second discrete response message on logical channel 1. Status discretes are reset when the condition causing the discrete is no longer present and either a 30 second poll has been received or 90 seconds or more has elapsed since the last poll.

The status discretes are:

- Machine congestion 1 condition (MC1) - set when MF receiver queue or CPU occupancy preset threshold is exceeded.
- Machine congestion 2 condition (MC2) - as above but different threshold value available.
- Machine congestion 3 condition (MC3) - triggered by a dead system, usually during a restart.
- Essential service protection/line load control active (ESP/LLC) - set when ESP or LLC activated.

Incoming trunk delayed readiness - set when incoming delayed readiness event in packet 1 of five-minute surveillance data becomes non-zero.

- Code control - set when call gap, code block or preroute peg set in DMS-100F code block/call gap list.

- Number services service control part (SCP) - initiated control - set when a call is cancelled for excessive calling to vacant codes or calling from non-purchased numbering plan areas (NPA), SCP controls, mass calling controls or service management system (SMS) initiated automatic call gap (ACG).

- Automatic destination codes to hard to reach (HTR) - set when a hard to reach flag manual trunk group control is applied from a MAP terminal.

The alerting discretetes are:

- Manual trunk group control change - set upon deletion, addition or modification of a CANT, SKIP, CANF or RR control initiated from a non EADAS/NM source. Reset upon receipt of manual trunk group controls audit request message.

- Code control change - set upon addition or removal of a code block, call gap or PRP code control. Reset upon receipt of a code controls audit request message.

Ref: EADAS/NM Phase I General Feature Description - GFX455AA
FDOC AF0183

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	ADMINISTRATION
Feature	TRUNK GROUP CONTROL IDENTIFIERS
Feature no	F6249

FEATURE SYNOPSIS

This feature provides the capability for the DMS-100 to assign up to 128 control identifiers to EADAS/NM originated trunk group controls.

FEATURE DESCRIPTION

The following trunk group controls are supported on the DMS-100 EADAS/NM interface:

- Cancel-To (CANT) - blocks traffic being offered to a trunk group.
- SKIP - prevents traffic being offered to a trunk group.
- Cancel-From (CANF) - blocks traffic that overflows a trunk group.
- Flexible reroute (FRR) - increases the number of routes available to a call.

Upon request from the EADAS/NM to apply for one these controls the DMS-100 will apply the control and the return a response message which will include a unique trunk group control identifier in the range 0-127. The EADAS/NM will use this as an index into its internal database. This index remains associated with the individual control until that control is removed.

The identifiers will limit the total number of active CANT, SKIP, CANF and FRR controls to 128 in offices with an EADAS/NM interface. No such restriction will be imposed on offices without the EADAS/NM interface.

Ref: DMS-100F - EADAS/NM Product and Interface Spec Issue 2.0 16 June 1986

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	ADMINISTRATION
Feature	EADAS/NM COMMAND INTERFACE
Feature no	F6316

FEATURE SYNOPSIS

This feature extends the capability of the EADAS/NM command interface to support additional network management controls.

FEATURE DESCRIPTION

Currently this interface supports packer schedule control and trunk group schedule control. This feature will extend the interface to support:

- Protective trunk group control - this control enables telephone traffic to be blocked from entering the network or prevent that traffic being routed over particular trunk groups. The controls are CANT, CANF and SKIP.

- Reroute control - this allows the network manager to apply, modify or remove a flexible reroute (FRR) control. This is an expansive trunk group control and increases the number of routes available to a call.

- Code control - this allows the network manager to apply, modify or remove a call gap control. This could be used to restrict the number of calls being made to a particular destination code.

- Total office control - this allows the network manager to remove control types on an office-wide basis with a single command.

Ref: NTP 297-1001-453

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	ADMINISTRATION
Feature	EADAS/NM AUDIT INTERFACE
Feature no	F6317

FEATURE SYNOPSIS

The Network Management Audit Interface implements the manual trunk group controls and code controls demand audits. In addition, two existing demand audits, trunk group reference data and trunk group list are modified to support the change mode of operation.

FEATURE DESCRIPTION

These audits can be issued from the EADAS/NM center at will but they are usually issued in response to a 30 second discrete poll response message.

The manual trunk group controls demand audit reads the DMS-100F database and sends a response message containing the DMS data pertaining to each trunk group in the DMS-100F with a manual control applied. Manual controls consist of cancel-to, cancel-from, SKIP and flexible reroute. The code controls demand audit reads the DMS-100F database and sends a response message containing the DMS data pertaining to every active code control in the DMS-100F. Codes include code blocking, reroute peg and hard to reach controls.

The trunk group reference data change audit and the trunk group list change audit only reads the data for trunk groups that have changed since the last audit request. This can drastically reduce the data sent to the EADAS/NM.

The trunk group reference data audit requests the DMS-100F trunk group schedule.

The trunk group list audit request the list of trunk groups defined in the DMS-100F.

Ref: EADAS/NM Phase I General Feature Description, GFX455AA
FDOC AF0183

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	ADMINISTRATION
Feature	EADAS/NM 5-MINUTE PACKET INTERFACE
Feature no	F6318

FEATURE SYNOPSIS

This feature provides six new packets of information for transfer to the EADAS/NM in the five minute data response.

FEATURE DESCRIPTION

The six new packets are:

1. Packet 2 : overload
2. Packet 7 : network management controls
3. Packet 11: machine activity
4. Packet 12: CCS SSP (common channel signalling service switching point) counts
5. Packet 24: code controls
6. Packet 25: manual reroute controls

FEATURE DESCRIPTION

This feature is part of EADAS/NM Phase II. The six packets are an addition to the eight that are currently implemented. The EADAS/NM requests transmission of the 5 minute data with the five-minute surveillance data request. The DMS-100F responds by sending the five minute surveillance data response.

The response consists of 25 packets of related registers.

The EADAS/NM can select portions of the 5 minute data for transmission by using either the packet schedule or trunk group schedule.

Ref: FDOC AF0184, BC1413

Package	NTX455AB01 1A EADAS NETWORK MANAGEMENT (UPG. OF NTX455AA)
Feature set	ADMINISTRATION
Feature	CHANGED TRUNK GROUP RECORDING ABILITY
Feature no	F6346

FEATURE SYNOPSIS

This feature records trunk groups that have been added, modified, or deleted in the DMS-100F since the last EADAS/NM trunk group list audit request or trunk group reference data change audit. This feature is part of the DMS-EADAS/NM Phase II interface.

FEATURE DESCRIPTION

This feature enables the DMS to support the trunk group list change audit and the trunk group reference data change audit described in feature document AF0183.

The use of a change audit as opposed to demand audit results in only changed trunk group data being transmitted to the EADAS/NM and hence can have dramatic transmission savings over the demand audit.

The trunk group list provides information for all groups currently in the DMS. The trunk group reference data provides more detailed information.

Ref: "EADAS/NM Phase II - NWM Audit Interface"
FDOC AF0183

Package	NTX550AA02 CCS7 - TRANSACTION SERVICE SUPPORT
Feature set	SERVICE
Feature	TCAP
Feature no	F5787

FEATURE SYNOPSIS

This feature implements the transaction capabilities application port (TCAP) of CCS7. In addition to basic circuit switched call control signalling, CCS7 provides support for advanced features including transaction capabilities such as database access for Enhanced 800 service (E800). TCAP, in conjunction with Signalling Connection Control Port (SCCP), provides the functionality required to support such services.

FEATURE DESCRIPTION

Transaction capabilities are functions which control non-circuit related information transfer between nodes in a CCS7 network. TCAP provides a framework for a common approach to new services within a network, by providing a set of procedures which can be used for a variety of services, avoiding the inefficiency of creating tailor made procedures for each new application.

The implementation is based on ANSI/ECSA recommendations Q.771-Q1.774. The transaction capabilities protocol format is separated into two parts, the transaction and component portions.

The transaction portion provides a means of associating messages with a specific application process transaction. A transaction consists of one or more messages exchanged between application processes on different network nodes.

The component portion ensures that components are formatted and exchanged properly. A component is a unit of information within a transaction. The component portion utilities provide all TCAP users with a common set of component encoding and decoding procedures. This eliminates the need for individual applications to implement message formatting procedures thereby reducing development time and minimizing the risk of protocol errors.

The TCAP protocol will be used between the SSP and the service control point (SCP) for the enhanced 800 service and for the ACCS.

Ref: FDOC BF0657

Package	NTX554AA01 CCS7 - E800/SSP
Feature set	SERVICE
Feature	E800
Feature no	F5674

FEATURE SYNOPSIS

This feature provides the 800+ services (enhanced Inwats) based upon CCS7 network.

FEATURE DESCRIPTION

E800 service is the first phase implementation of SS7 numbering services. This feature is provided in the following switching office type:

1. Equal access end office
2. DMS-200
3. TOPS access tandem equal access

E800 service uses a special number service code (800) to indicate calls requiring database query to obtain routing information as well as other call handling instructions. E800 service are provided on a service switching point (SSP) which communicates with telco database using SS7 signalling. An SSP may be either an access tandem (AT) or equal access end office (EAEO) in the equal access network.

Ref: FDOC BV1858

NTX560AA03 Status: A+M NOP_REMOTE OPERATIONS SERVICE(UPG.BY NT

MAINTENANCE	:	
GENERALIZED MAP CAPABILITY		F5710
ADMINISTRATION	:	
CC GENERAL PURPOSE RO IMPLEMENTATION		F5956
OPTIONAL USE OF MPC BY NOS RO SERVICE		F6062
GENERIC RO SERVICE ENHANCEMENTS		F6236

Package	NTX560AA03 NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB)
Feature set	ADMINISTRATION
Feature	CC GENERAL PURPOSE RO IMPLEMENTATION
Feature no	F5956

FEATURE SYNOPSIS

This feature generalizes RO (remote operation) interface implemented by feature F5421 to applications between DMS and external systems. It is a partial implementation of NOP (Network Operations Protocol) in DMS.

The higher levels of the NOP S/W reside in DMS CC and are referred to as RO service. The primary function of the RO service is to receive, interpret and transmit RO's.

FEATURE DESCRIPTION

An RO is a task requested by one processor, e.g., NOS, but performed by a remote processor i.e., DMS. The RO's used are based on the concept of RO's as defined in CCITT Recs X.410 and X.409. Lower level communication is via X.25 protocol which in turn interfaces with the 1X67DB terminal controller board.

The RO service per this feature is a generalized version of the RO interface implemented by F5421. The purpose of this new version is to provide an interface for the communication of RO's between applications residing in DMS and external systems such as NOS. The RO service conforms to the ISO's reference model for open systems interconnections. It resides on top of layer 3 X.25 protocol and comprises layers 6 and 7.

Ref:

DDOC BC2128, BC1519
CCITT Recs. X.409, X.410

Package	NTX560AA03 NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB)
Feature set	ADMINISTRATION
Feature	OPTIONAL USE OF MPC BY NOS RO SERVICE
Feature no	F6062

FEATURE SYNOPSIS

This feature allows the use of either the 1X67 (DPC or DPAC) or 1X89 (MPC) card for the transfer of information between DMS and DNC. Use of the MPC will reduce the processing time required in the DMC CC.

FEATURE DESCRIPTION

DPC or DPAC was the initial DMS-NOS interface and will still be in use. This feature allows the new multi-protocol controller (MPC) which is a downloadable I/O device, to be used for data communications. Now there is a choice of using either one or the other device for RO (remote operation) services, such as file transfer, pass through MAP, and DCR. That option is driven by an office parameter in table OFCENG. After an IPL restart, the I/O device is set to be the MPC (MPC is the default). If the system does not have the capacity to use the MPC, the office parameter can be changed to DPC. The option is not application dependent but switch dependent, i.e., all applications running on the same switch will use the same I/O controller specified by the parameter.

Ref: DDOC AG0055

Package	NTX560AA03 NOP_REMOTE OPERATIONS SERVICE(UPG.BY NTX560AB)
Feature set	ADMINISTRATION
Feature	GENERIC RO SERVICE ENHANCEMENTS
Feature no	F6236

FEATURE SYNOPSIS

This feature represents enhancements to the software package known as the generic RO service introduced in BCS 21. The generic RO service provides a generalized RO (remote operation) interface between applications in DMB and external systems such as NOS (network operations system).

FEATURE DESCRIPTION

The original generic RO service was implemented in BCS 21 (F5956). The RO service is a partial implementation of NOP (networks operation protocol) in DMS. The primary function of the RO service is to receive, interpret and transmit ROs.

An RO is a task requested by one processor eg, NOS, but performed by a remote processor eg, DMS. The ROs used are based on the concept of ROs as defined in the CCITT Recommendation X.410.

In the original design, RO service depends on the NOS communications applications layer (feature F5421) to interact with X.25 communications software. The main purpose of this feature is to eliminate this reliance by separating RO service from the NOS communications applications layers thereby making the latter feature obsolete.

Other enhancements provided by this feature are: improved access to stored application encode/decode procedures, provision of an interface for application to define a descriptive tag for history RO's, modification of the application/RO service interface to allow application to provide names for each remote operation, optimization of encoding and decoding utilities.

This feature also adds operational measurements and logs.

Ref: FDOC AG0110

NTX560AB02 Status: RTM NOP - GENERIC RO SERVICE (UPG. OF NTX56

MAINTENANCE	:	
GENERALIZED MAP CAPABILITY		F5710
ADMINISTRATION	:	
CC GENERAL PURPOSE RO IMPLEMENTATION		F5956
OPTIONAL USE OF MPC BY NOS RO SERVICE		F6062
GENERIC RO SERVICE ENHANCEMENTS		F6236
X.25 PACKAGING ENHANCEMENTS FOR NOP		F6319

Package	NTX560AB02 NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
Feature set	ADMINISTRATION
Feature	CC GENERAL PURPOSE RO IMPLEMENTATION
Feature no	F5956

FEATURE SYNOPSIS

This feature generalizes RO (remote operation) interface implemented by feature F5421 to applications between DMS and external systems. It is a partial implementation of NOP (Network Operations Protocol) in DMS.

The higher levels of the NOP S/W reside in DMS CC and are referred to as RO service. The primary function of the RO service is to receive, interpret and transmit RO's.

FEATURE DESCRIPTION

An RO is a task requested by one processor, e.g., NOS, but performed by a remote processor i.e., DMS. The RO's used are based on the concept of RO's as defined in CCITT Recs X.410 and X.409. Lower level communication is via X.25 protocol which in turn interfaces with the 1X67DB terminal controller board.

The RO service per this feature is a generalized version of the RO interface implemented by F5421. The purpose of this new version is to provide an interface for the communication of RO's between applications residing in DMS and external systems such as NOS. The RO service conforms to the ISO's reference model for open systems interconnections. It resides on top of layer 3 X.25 protocol and comprises layers 6 and 7.

Ref:

DDOC BC2128, BC1519
CCITT Recs. X.409, X.410

Package	NTX560AB02 NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
Feature set	ADMINISTRATION
Feature	OPTIONAL USE OF MPC BY NOS RO SERVICE
Feature no	F6062

FEATURE SYNOPSIS

This feature allows the use of either the 1X67 (DPC or DPAC) or 1X89 (MPC) card for the transfer of information between DMS and DNC. Use of the MPC will reduce the processing time required in the DMC CC.

FEATURE DESCRIPTION

DPC or DPAC was the initial DMS-NOS interface and will still be in use. This feature allows the new multi-protocol controller (MPC) which is a downloadable I/O device, to be used for data communications. Now there is a choice of using either one or the other device for RO (remote operation) services, such as file transfer, pass through MAP, and DCR. That option is driven by an office parameter in table OFCENG. After an IPL restart, the I/O device is set to be the MPC (MPC is the default). If the system does not have the capacity to use the MPC, the office parameter can be changed to DPC. The option is not application dependent but switch dependent, i.e., all applications running on the same switch will use the same I/O controller specified by the parameter.

Ref: DDOC AG0055

Package	NTX560AB02 NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
Feature set	ADMINISTRATION
Feature	GENERIC RO SERVICE ENHANCEMENTS
Feature no	F6236

FEATURE SYNOPSIS

This feature represents enhancements to the software package known as the generic RO service introduced in BCS 21. The generic RO service provides a generalized RO (remote operation) interface between applications in DMB and external systems such as NOS (network operations system).

FEATURE DESCRIPTION

The original generic RO service was implemented in BCS 21 (F5956). The RO service is a partial implementation of NOP (networks operation protocol) in DMS. The primary function of the RO service is to receive, interpret and transmit ROs.

An RO is a task requested by one processor eg, NOS, but performed by a remote processor eg, DMS. The ROs used are based on the concept of ROs as defined in the CCITT Recommendation X.410.

In the original design, RO service depends on the NOS communications applications layer (feature F5421) to interact with X.25 communications software. The main purpose of this feature is to eliminate this reliance by separating RO service from the NOS communications applications layers thereby making the latter feature obsolete.

Other enhancements provided by this feature are: improved access to stored application encode/decode procedures, provision of an interface for application to define a descriptive tag for history RO's, modification of the application/RO service interface to allow application to provide names for each remote operation, optimization of encoding and decoding utilities.

This feature also adds operational measurements and logs.

Ref: FDOC AG0110

Package	NTX560AB02 NOP - GENERIC RO SERVICE (UPG. OF NTX560AA)
Feature set	ADMINISTRATION
Feature	X.25 PACKAGING ENHANCEMENTS FOR NOP
Feature no	F6319

FEATURE SYNOPSIS

This feature eliminates the need for customers to order both the data packet controller (DPC) software and the multiple protocol controller (MPC) software when purchasing the networks operations protocol (NOP).

FEATURE DESCRIPTION

This feature converts NOP to use the GDL (generic data link) which allows it to use either the MPC or the DPC I/O package. DPC is used with the 1X67 messaging while MPC is used with the 1X89AA messaging card. In the previous version of NOP, both I/O packages of utilities had to be ordered along with NOP.

This feature allows NOP to call generic procedures provided by GDL to establish and perform data transferral functions. The procedures for performing data transferral are provided by available I/O packages. GDL provides the means for applications such as NOP and XFER to choose the desired I/O package and automatically route data to the proper transferral procedures.

Ref: DDOC AG0306

NTX562AA02 Status: RTM NOS - DATA COLLECTION

ADMINISTRATION	:	
FILE TRANSFER FROM DMS TO NOS		F3905
KILLER TRUNK REPORT SEPARATION		F3977
AUTOMATIC TRUNK TESTING REPORT		F3978
CONVERSION OF NOS FILE TRANSFER TO GENERIC RO SERVICE		F6235
FILE TRANSFER FROM DNC TO DMS VIA NOP 1X.25		F7128

Package	NTX562AA02 NOS - DATA COLLECTION
Feature set	ADMINISTRATION
Feature	FILE TRANSFER FROM DMS TO NOS
Feature no	F3905

FEATURE SYNOPSIS

This feature provides the DMS with capability to transfer telco and customer data over a communication link concurrently with the generation of the data on the DMS.

FEATURE DESCRIPTION

This feature performs the following major functions:

- . generates a list of files available on the DMS for access to TNOS (Telco Network Operating System).
- . transfer a file to TNOS via switch virtual circuit
- . changes the status of a file on the DMS
- . files being actively recorded by DIRP

References:

BC1375, BC1519

Package	NTX562AA02 NOS - DATA COLLECTION
Feature set	ADMINISTRATION
Feature	KILLER TRUNK REPORT SEPARATION
Feature no	F3977

FEATURE SYNOPSIS

This feature will provide a new report separation output capability for the killer trunk report.

FEATURE DESCRIPTION

The primary purpose of this feature is to transfer the results generated by the Killer Trunk (KT) feature to a DIRP file. KT results can be selectively written to the file based on whether or not the trunk group is TELCO or CUSTOMER owned. A utility will be provided to display the contents of a KT result file with the output being routed to a TELCO device. This utility will be available to TELCO operating personnel only.

Ref: FDOC BC1460

Package	NTX562AA02 NOS - DATA COLLECTION
Feature set	ADMINISTRATION
Feature	AUTOMATIC TRUNK TESTING REPORT
Feature no	F3978

AUTOMATIC TRUNK TESTING REPORT (F3978/BC1461)FEATURE SYNOPSIS

The primary purpose of this feature is to transfer the scheduled Automatic Trunk Testing (ATT) results to a Device Independent Recording Package (DIRP) file.

By using the ownership facility introduced by the optional feature 'Customer Network Data Changes', the TELCO is allowed to specify which trunk groups belong to a given customer.

This feature captures all the existing TTR reports. This capturing shall ensure the user access only to trunks which belong to that user and it re-formats the record into a standard format which will be transferable via DIRP to the appropriate stream based on trunk group ownership. By datafill, a TELCO can ensure centrex users have access only to their trunk groups.

FEATURE DESCRIPTION

The existing automatic trunk testing (ATT) feature provides trunk testing results (TTR) for selected trunk groups. At scheduled testing intervals, the ATT process generates a report via the log system. The purpose of this feature is to transfer the TTR results to a DIRP file. This file denoted as TTRF in this document.

The DIRP file need not contain trunk test results for all trunk groups tested. Results may be included or excluded from the DIRP file based on the ownership of the trunk group.

The customer ownership table permits each trunk group to be classified as TELCO or CUSTOMER owned. Normally all the trunk group reports are printed on a log device, therefore an office parameter for selecting which class of trunk groups should be placed on the DIRP file will be provided.

This feature is implemented to handle one customer only, it does not provide differentiation between customers in a multicustomer environment.

Package	NTX562AA02 NOS - DATA COLLECTION
Feature set	ADMINISTRATION
Feature	CONVERSION OF NOS FILE TRANSFER TO GENERIC RO SERV
Feature no	F6235

FEATURE SYNOPSIS

This feature converts the network operations system (NOS) file transfer capability from the old version of network operations protocol (NOP) (F5421) to the generic remote operation (RO) service implementation F5956 introduced in BCS 21. The NOP MAP level, being dependent on the old version of NOP is also converted to use the generic RO service.

FEATURE DESCRIPTION

The propose of RO SERVICE is to provide an interface for the communication of RO between applications residing in DMS and external systems such as NOS. The existing applications that currently need that interface to function are file transfer (FT), centralized MAP (CMAP), dynamically controlled routing (DCR) and the NOP MAP level.

File transfer was the first of these features to be implemented (BCS 18). Due to lack of time, the RO service (NOS communication application layer) that was created to provide the DMS-NOS interface to file transfer (ie, F5421) was built exclusively for file transfer, with no provision for future NOS applications.

In BCS 20, the NOP MAP level came into existence as a new NOS tool to monitor the state of the DMS-NOS communciation, using the same RO service (F5421).

In BCS 21, a generic RO service (F5956), was implemented to accomodate CMAP and DCR. The purpose of this feature is to convert FI and the NOP MAP to that new RO service interface (F5956). This enables the NOS communication application layer to be deleted and simplifies the implementation and maintainability of the code.

It should be noted that this feature does not remove or change in any way the functionalities provided by the old file transfer.

Ref: FDOC AG0099

Package	NTX562AA02 NOS - DATA COLLECTION
Feature set	ADMINISTRATION
Feature	FILE TRANSFER FROM DNC TO DMS VIA NOP 1X.25
Feature no	F7128

FEATURE SYNOPSIS

This feature allows Operating Companies and other users to download files to a DMS from a remote node (computer) using Network Operations Protocol (NOP).

FEATURE DESCRIPTION

This feature keeps track of the data being received and can request re-sending of data if an error condition occurs. If the link between the remote node and the DMS goes down during the transmission of a file, the file will be closed and the session logged off. When the connection is reestablished, the existing file will be opened and data received will be added.

This feature also implements three CI commands: COMPRESS, EXPAND, and SUM, to compress a file, expand a compressed file and calculate the checksum of a file respectively.

This feature adds a log, FTS, to record remote file transfer operations. An FTS log report is generated upon successful downloading of a file.

Ref: FDOC AG0945

NTX563AA03 Status: RTM BNM - STATION ADMINISTRATION

INTERFACES	:	
SERVORD INTERFACE FOR NOS		F5878
ADMINISTRATION	:	
UPHEAD OF CUSTOMER LINE DATA TO DNC		F6234
DMS DATA COLLECTION		F7142
BNM CUSTOMER DATA UPLOAD ENHANCEMENT		F7171
BNM	:	
BNM-DMS UPLOAD SUPPORT FOR ISDN STATION DATA		F7397

Package	NTX563AA03 BNM - STATION ADMINISTRATION
Feature set	INTERFACES
Feature	SERVORD INTERFACE FOR NOS
Feature no	F5878

FEATURE SYNOPSIS

This feature modifies the existing DMS Service Order (SERVORD) system to allow line data modifications from the Network Operations System (NOS) through the DMS passthru MAP.

FEATURE DESCRIPTION

A NOS user can logon to the DMS system using the DMS passthru MAP feature. (S)he can then proceed to enter the SERVORD increment to use Service Order commands. A new service order command DNC is introduced for NOS use exclusively. This command will let SERVORD know that all subsequent SERVORD commands in that session are coming from NOS on a Dynamic Network Control system (DNC) via DMS passthru MAP.

All service order commands coming from NOS have to be preceded with a number for identification purpose. Otherwise the command will fail and the user will receive an error message indicating that a number is expected at the beginning of the command input line.

If all the data in the input command pass checking successfully, the Service Order command will be executed if the switch is in sync, and Journal File is running. Otherwise appropriate error messages will be outputted as normally is the case for Service Order.

The feature is part of a group of features used by BNM (Business Network Management) Moves and Changes.

Ref: FDOC AC0023

Package	NTX563AA03 BNM - STATION ADMINISTRATION
Feature set	ADMINISTRATION
Feature	UPHEAD OF CUSTOMER LINE DATA TO DNC
Feature no	F6234

FEATURE SYNOPSIS

The purpose of this feature is to transfer the line data of given customer group(s) on a DMS switch to a Dynamic Network Control system (DNC) for the initialization of it's customer data base.

A Command Interpreter (CI) command QCUST is introduced to query the line data associated with specified customer group(s).

FEATURE DESCRIPTION

A new CI command QCUST is introduced to query all the lines associated with given customer groups. It takes up to 5 customer group names as parameters. Alternatively, QCUST ALL will retrieve the line data associated with all the customer groups in the switch.

The command can also take a line equipment number if the data on a single line only is required.

This command will be used by feature "MAC Database loading from DMS" on a DNC via PASSTHRU MAP to upload the line data of given customer group(s) on a DMS switch to the DNC to initialize the data base on the DNC.

This feature is optional and is to be used in the beginning of each BCS cycle to upload the line data to DNC to ensure the integrity of the data base.

Ref: FDOC AG0092

Package	NTX563AA03 BNM - STATION ADMINISTRATION
Feature set	ADMINISTRATION
Feature	DMS DATA COLLECTION
Feature no	F7142

FEATURE SYNOPSIS

This feature adds parameters to command QCUST to allow the synchronization of the DMS and Dynamic Network Controller (DNC) databases by uploading data about lines that have been changed on the DMS but not the DNC.

This feature also provides an interface to the IBNRTE and TRKGRP tables to allow changes to specific fields.

FEATURE DESCRIPTION

Changes to line data affecting a DNC customer can be originated on the DMS. The DNC does not have this data and the DNC database is no longer aligned with the DMS line data tables.

This feature accesses a list of changed lines and outputs all the data associated with these lines.

The DNC sends a QCUST command to the DMS and all the data about changes lines is uploaded. The DNC then sends another QCUST command to the DMS and the uploaded information is removed from the list.

If the list of changed lines becomes full, a log message is printed advising that a database synchronization should be done to clear out the list.

Ref: FDOC AG0755

Package	NTX563AA03 BNM - STATION ADMINISTRATION
Feature set	ADMINISTRATION
Feature	BNM CUSTOMER DATA UPLOAD ENHANCEMENT
Feature no	F7171

FEATURE SYNOPSIS

This feature provides table control procedures for Table BNMCUST. This table maps Business Network Management customer names to customer groups. Table BNMCUST allows BNM customers to upload all customer groups at once during initial upload.

FEATURE DESCRIPTION

This feature implements table operations for BNMCUST such that tuples can be added before initial upload. Each tuple of BNMCUST consists of the customer name and the customer group.

An option is also added which allows initial uploading of all customer groups for a given customer name.

Ref: FDOC AG1163

Package	NTX563AA03 BNM - STATION ADMINISTRATION
Feature set	BNM
Feature	BNM-DMS UPLOAD SUPPORT FOR ISDN STATION DATA
Feature no	F7397

Synopsis

The ISDN Station Administration DMS Upload feature provides the following ISDN line data to the Dynamic Network Controller (DNC) during the uploading of DMS data to the DNC:

the Logical Terminal Identifier (LTID)
the set of services allowed for the logical terminal
the Access Privileges (AP) for the services the logical terminal can access
the line to which the logical terminal is connected.
an indication of whether the LTID is mapped or attached to an ISDN LEN
a list of options based on the terminal access privileges.

Implementation

No operating company action is required to implement this feature.

This feature modifies the QCUST command to provide this additional ISDN line data from the DMS to the DNC.

The QCUST command issued from the DNC activates the uploading of DMS data to the DNC.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX812AA Centralized MAP
NTX560AA NOP Remote Operations Service or
NTX560AB NOP Generic RO Service

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature interacts with the Upload of Customer Line Data to DNC feature. These two features work together to initialize ISDN line data on the DNC.

Restrictions

Packet-switched data is uploaded only if the ISDN Line Equipment Number (LEN) has circuit-switched or voice data. Since the uploading process is on a per customer group basis, the system assumes that the packet-switched LTID belongs to the same customer group(s) as the circuit-switched LTID.

Reference

FDOC AG1472

Package	NTX571AA01 IBN - DIRECTED CALL PARK,2500 SET ONLY
Feature set	ATTENDANT FEATURE
Feature	DIRECTED CALL PARK
Feature no	F3925

FEATURE SYNOPSIS

This feature will enable the user to park calls against other directory numbers as well as restrict the retrieval of parked calls by the use of station specific security codes.

FEATURE DESCRIPTION

The directed call park (DCPK) feature provides both p-phone and 2500 (IBN) stations with the capability of holding ("parking") one call against any valid IBN station directory number appearance in the system, from where it may later be retrieved by any station.

The use of a variable length security code will be added as a separate option (security code feature - BZ0221) which will allow up to ten features to be assigned to the security code. In the event that a call is parked against a directory number flagged "security", the retriever will be prompted by tone to enter the security code following his request for retrieval and digit entry of the directory number that the call parked against.

DCPK may be divided into two major components:

. Directed call park store:

This enables the parking of one call against a directory number. After requesting access to the directed call park feature, the user enters the digits of the directory number that the call is to be parked against.

. Call park retrieve:

This allows any station user to retrieve a parked call by first requesting the call park retrieve feature and then entering the directory number of the station against which the call was parked. This function is identical to that used in the feature call park, except in the case where a station is flagged "security" and a security code must be entered to retrieve the call (refer to section on feature assignment for more details).

Any p-phone or 2500 (IBN) station is capable of retrieving parked calls, even though that station may not have the directed call park feature assigned. On p-phones assigned a dedicated directed call park key, the same key may be used for both parking calls and retrieving them. The parking of a call against a directory number appearance does not inhibit that sta-

tion in any way - the line remains available for the origination and reception of calls.

Directed call park will be assigned on a line basis. Each customer group is limited to a maximum of 100 calls which may be parked simultaneously, whether by call park or directed call park.

DCPK may be considered an enhanced version of the call park feature, since it adds the capability of parking a call against any valid IBN station directory number (as opposed to only that of the parker) and the option of a security code.

References: FDOC BV1535, BV0938, BV0534, BZ0221

NTX621AA02 Status: RTM SMU SPECIAL SERVICES

CALL PROCESSING	:	
SMU FXB HAIRPIN SPECIAL SERVICES		F6254
SSM HAIRPIN		F6255
DE4 DPX HAIRPIN TO DTC		F6256
INTEGRATED LOCAL SPECIALS		F6257

Package	NTX621AA02 SMU SPECIAL SERVICES
Feature set	CALL PROCESSING
Feature	SMU FXB HAIRPIN SPECIAL SERVICES
Feature no	F6254

FEATURE SYNOPSIS

This feature provides hairpin connection capability to the SMU and the required CC support. This includes the ability to datafill such connections, to audit these connections and to ensure the trunk conditioning standards are complied with.

FEATURE DESCRIPTION

This feature provides the Central Control (CC) software to support hairpin connections through the Subscriber Module DMS-1 Urban (SMU). Class 1 Special Services can be implemented on the SMU via these nailed-up peripheral-side (p-side) to p-side cross-connections. Included in this feature is the datafill, maintenance, and audit of these hairpin special service connections. This feature also handles trunk conditioning and the optional extraction/reinsertion of the AB supervisory signalling bits on SMU special service connections.

This feature has no significant impact on real time.

Ref: DDOC AF0264, AF0234

Package	NTX621AA02 SMU SPECIAL SERVICES
Feature set	CALL PROCESSING
Feature	SSM HAIRPIN
Feature no	F6255

FEATURE SYNOPSIS

This feature integrates the special services module (SSM) of the RCU into the DMS-1U system. The SSM channel units are special service lines with some additional requirements. This feature provides the SMU software required to support the additional requirements. The rest of the SSM support is provided by existing SMU software.

FEATURE DESCRIPTION

The Subscriber Carrier Module - Urban (SMU) interfaces the DMS-1U Remote Terminal (RT) to the Central Control (CC) in the DMS-100 system. An RCU can be connected to an SMU with between 2 and 8 DS1 links. The SMU can have a maximum of 20 DS1 links connected to it for a maximum of 10 RCUs off of an SMU.

An SSM is an additional RCU shelf providing space for 24 Northern Telecom DE-3/DE-4 channel units, SSM common equipment, SSM/RCU interface circuit packs, and optional maintenance circuit packs. This feature integrates the SSM into the SMU-RCU system.

Ref: DDOC AF0938, AF0880

Package	NTX621AA02 SMU SPECIAL SERVICES
Feature set	CALL PROCESSING
Feature	DE4 DPX HAIRPIN TO DTC
Feature no	F6256

FEATURE SYNOPSIS

This feature tests the ability of the Subscriber Carrier Module Urban (SMU) to support nailed up connections from a Special Services Module (SSM) containing a DataPath eXtension (DPX) card to a Digital Trunk Carrier (DTC).

FEATURE DESCRIPTION

DPX cards are designed as carriers of Digital Line Cards (DLC). They fit into DE-4 channel banks and interface to the DMS as a trunk coming in on a DTC. They are used in applications where the closest Line Concentrating Module (LCM) or Remote Line Concentrating Module (RLCM) is more than 5 Km from the end user.

DLCs allow the DMS to call process on Data Units (DU). These DUs are high speed digital modems allowing baud rates of up to 64 kilobaud for LCMS or 56 kilobaud on SSMs.

Ref: DDOC AF0239

Package	NTX621AA02 SMU SPECIAL SERVICES
Feature set	CALL PROCESSING
Feature	INTEGRATED LOCAL SPECIALS
Feature no	F6257

FEATURE SYNOPSIS

This feature tests the ability of the Subscriber Carrier Module Urban (SMU) to support several line class codes pertaining to business lines. Specifically, it ensures the ability of the Telco to datafill teletypewriter exchange, inwats, outwats, and private branch exchange (BPX) line classes.

FEATURE DESCRIPTION

Call services provided by the operating company other than residence, coin, and non-PBX business telephones are considered special services. This feature tests the ability of the SMU to support the most common class 1 special services. These include Teletypewriter Exchange (TWX), Inwats (INW), Outwats (OWT) and PBX lines.

Ref: DDOC AF0240

Package	NTX645AA01 TOPS - SERVICE BILLING
Feature set	SERVICES
Feature	TOPS - LONG DISTANCE DIRECTORY ASSISTANCE
Feature no	F2622

FEATURE SYNOPSIS

This feature shall provide the Telco with the option to rate calls to service numbers such as NPA-555-XXXX calls.

FEATURE DESCRIPTION

The present rating system allows three classes of rating viz: domestic, overseas and local. With this feature a fourth class called service is introduced with means to identify called numbers as service numbers. This shall allow Telcos to specify rating information on a 3, 7 or 10 digit basis for dialled numbers in the form NPA-555-XXXX or 555-XXXX.

As a result of this feature, a new display will be created when called numbers are displayed at the operator position. It will appear at line 4, column 21 as 'SRV', when the called number is listed in the new table SERVSCRN. This is also compatible with MCCS and ACTS.

The call will not be billed if the TOPS operator herself provides the necessary information.

NTX710AA02 Status: RTM LATA EQUAL ACCESS SYSTEM

LATA EQUAL ACCESS SYSTEM	:	
INCOMING TRUNK CALL PROCESSING		F5990
TRANSLATION AND ROUTING		F5991
SIGNALLING CONVERSION		F5992
ORIGINATING BILLING		F5993
DATABASE SYSTEM ENHANCEMENTS		F5994
DATABASE REPORTING		F5995
DNPIC BULK DMO TOOL		F6263
SUPER CAMA TRAVER HANDLING		F6264
LEAS	:	
LEAS-SPECIAL DIRECTORY NUMBER IDENTIFICATION		G0117

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	INCOMING TRUNK CALL PROCESSING
Feature no	F5990

FEATURE SYNOPSIS

This feature is one of general features which make up the LATA equal access system (LEAS) feature package NTX710AA. The purpose of this feature is to provide the interface between a LEAS Access Tandem (AT) and the non-conforming end offices (NCEO) which subtend LEAS AT to allow for equal-access-like service to be provided for subscribers of NCEOs.

FEATURE DESCRIPTION

With the advent of equal access there are still numerous non-conforming end offices which cannot or will not be upgraded to provide EA service. LEAS provides the capability at a DMS-200 AT to provide EA-like service to customers served by NCEOs. That is, a customer served by an NCEO is able to access an interLATA carrier (IC) or using presubscription or using per call carrier selection by dialling 10XXX carrier access code (CAC) prefix. This is done by allowing collection and translation of all EA dialing patterns signalled from the NCEO to the AT and by providing a LEAS database at the AT. The LEAS database contains subscriber EA service information for each customer served by an NCEO which subtends the AT. The subscriber EA service information includes the following information for each subscriber:

- The subscriber's primary carrier (PIC),
- Identification of those carriers to which the subscriber is denied access, carrier toll denial (CTD),
- An indicator of whether or not the subscriber is allowed to select a carrier on a per call basis (CHOICE).

For each call incoming to a LEAS AT from a NCEO for which LEAS service is to be provided, the directory number (DN) of the calling party is obtained. LEAS translations determine if LEAS EA handling is required for the call and if so, the calling party DN is used to access the subscriber's EA service information which is used to route the call, as based on the evaluation of the called digits and the EA service information.

This feature covers:

- The incoming trunking arrangement between an NCEO and a LEAS AT.
- The signalling and digit collection of called digits required for LEAS calls sent from an NCEO.

- Handling of automatic number identification (ANI)/operator number identification (ONI) for LEAS calls.

Ref: GFX710AA General Feature Description - LEAS
BC1701 FDOC

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	TRANSLATION AND ROUTING
Feature no	F5991

FEATURE SYNOPSIS

This feature is one of eight comprising the LATA equal access system (LEAS) feature package NTX710AA. It provides the capability of translating and routing of calls incoming from non-conforming end offices (NCEO) at LEAS access tandem (AT) to interLATA, intraLATA, and international carriers for completion. The capability of marking trunk groups for LEAS service is provided. LEAS screening is supported for calls incoming on superCAMA and TOPS trunk groups that are marked for LEAS.

FEATURE DESCRIPTION

The LEAS package provides service at an AT similar to that provided at EAEOs, allowing subscribers resident on NCEOs to take advantage of many of the capabilities of equal access service.

Calls from NCEOs are received at the LEAS AT on either superCAMA (centralized automatic message accounting) or TOPS (traffic operator position system) trunks. Any dialling pattern allowed at an EAEO (with the exception of abbreviated dialling 2 (AD2) and 3 (AD3) speed calling) is accepted, although a subscriber's ability to dial the longer patterns (consisting of more than 15 digits) depends on the outputting capability of the local office. The subscriber dialling patterns accepted with LEAS are:

(10XXX) + (0/1) + (NPA) + 7 digit DN
 (10XXX) + 01/011 + CC + NN
 (10XXX) + 0(0/#)
 10XXX + #
 (0/1) + 950-WXXX
 (10XXX) + (0/1) + 911
 (0/1) + SAC + 7 digit DN

Some NCEOs may strip the first digit from a subscriber dialled digit sequence prior to outputting the called digits to the LEAS AT. The pre-translator datafill for incoming trunk groups from such NCEOs compensates for this when setting the number of prefix digits, allowing translations to continue unaffected.

The calling party must be identified on each call incoming from an NCEO. This is accomplished either by automatic number identification (ANI) or by operator number identification (ONI). If the call requires equal access handling, the subscriber's numbering plan area (NPA) and directory number (DN) are used to query the LEAS database, resulting in the subscriber's equal access service information. This information is used to determine a route to either a carrier, the operating telephone company (OTC), or (in

treatment cases) an announcement or tone. Routing of non-LEAS calls is not affected.

This feature provides:

- translation capabilities
- LEAS call determination
- LATA screening
- subscriber equal access service checks
- carrier service checks
- routing to carriers
- treatment of call failure cases.

Ref: GFX710AA General Feature Description - LEAS
BC1702 FDOC

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	SIGNALLING CONVERSION
Feature no	F5992

FEATURE SYNOPSIS

This feature is one of eight comprising the LATA equal access system (LEAS) feature package NTX710AA. It provides the capability to convert the traditional signalling format supported by the non-conforming end offices (NCEO) to the equal access plan (EAP) signalling format (including ANI format conversion). It provides signalling between the LEAS equipped DMS-200 access tandem (AT) and the interLATA (IC) or international (INC) carrier. FGC and FGD carrier signaling is supported.

FEATURE DESCRIPTION

The LEAS package provides service at an AT similar to that provided at EAEOS, allowing subscribers resident on NCEOs to take advantage of many of the capabilities of equal access feature. This feature handles LEAS call processing beginning with outgoing trunk seizure through completion of call set-up. The following two functional areas of implementation are addressed:

- 1) Converting the traditional signaling format to the EAP signaling format when required:
 - build double digit ANI information (II) from AMR5 CAT code,
 - build double digit ANI information (II) from single digit (I),
 - outpulse II + calling number followed by called number with the required KP/ST signals.
- 2) Providing signaling to the IC/INC in the same format as an EAEO:
 - support FGC and FGD signaling,
 - intercept winks normally sent by carrier back to EAEO,
 - provide billing call event status setting for call event 07.

Ref: GFX710AA - General Feature Description LEAS
BC1703 FDOC

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	ORIGINATING BILLING
Feature no	F5993

FEATURE SYNOPSIS

This feature provides the DMS-200 access tandem with the capability to generate originating access charge and subscriber billing records in Bellcore format for LATA equal access system (LEAS) calls.

FEATURE DESCRIPTION

The LEAS package (NTX710AA) provides service at an AT similar to that provided at EAEOs, allowing subscribers resident on NCEOs to take advantage of many of the capabilities of equal access feature. Equal access originating billing is accomplished at the equal access end office (EAEO) in a LAMA environment. LEAS originating billing for NCEOs has to be accomplished at the access tandem office in a CAMA environment.

This feature provides originating billing (access charge and detail subscriber billing) for all LEAS calls arriving from NCEOs over super CAMA and TOPS trunks.

Billing for interlata station paid calls is supported. Also a 10XXX indicator over TOPS trunk groups is added to the presubscription indicator field of the TOPS billing structure code.

Since CAMA billing is performed at the DMS-200 AT office, there are certain call attributes required by EA billing that cannot be determined at the AT office. Hence there are some differences between EA and LEAS billing.

Ref: BC1704 FDOC
GFX710AA General Feature Description LEAS

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	DATABASE SYSTEM ENHANCEMENTS
Feature no	F5994

FEATURE SYNOPSIS

LATA equal access system (LEAS) requires that IC/INC related data be available on a per subscriber basis in access tandem (AT) office in order to provide equal-access-like service to non confirming end offices (NCEOs). Through the modification of existing tables in the DMS-200, this feature makes the required subscriber data available in the LEAS AT.

FEATURE DESCRIPTION

LEAS is a DMS-200 software package (NTX710AA) which provides equal access like service to NCEOs. The typical NCEO is an electromechanical or non-SPCS office which does not/cannot conform to the specifications indicated for an EAEO as dictated by FSD 20-24-0000 of the LSSGR. LEAS is intended to provide NCEOs with most of EA services associated with an EAEO by their migration into an AT, where it is technically and economically feasible.

LEAS database, a place where LEAS subscriber data is stored, is the composite of tables DNPIC and PICNAME. These tables were created by package NTX714AA (TOPS interLATA carrier service - TICS) and are modified and used for LEAS application. In addition to the modification of these tables, LEAS call processing software is provided with a lookup procedure for acquiring data from table DNPIC and linking it to the carrier data held in table OCCINFO.

LEAS database is used to accomplish three major functions:

- presubscribed dialing
- 10XXX dialing choice
- carrier toll denial

Ref: BC1705 FDOC
GFX710AA - LEAS
GFX714AA - TICS

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	DATABASE REPORTING
Feature no	F5995

FEATURE SYNOPSIS

This feature provides a new command which enables Telco personnel to generate various reports concerning presubscription data for subscribers entered in the LATA equal access system (LEAS) database.

FEATURE DESCRIPTION

This feature is one of eight features that comprise the LEAS package NTX710AA, which resides in a DMS-200 access tandem (AT) switch. LEAS provides equal access like service to non-conforming end offices (NCEO) subtending the AT. A database is used to obtain presubscription information for subscribers of the subtending offices. This database is a table called DNPIC.

This feature provides reports containing presubscription data similar to that available in an EAEO. A new CI command, DNPICLIST, is introduced which is modelled after PICLIST command available in an EAEO, to obtain presubscription reports. These reports include a listing of DNs with a given carrier as their PIC, a listing of DNs without a PIC, or a listing of DNs presubscribed to each carrier. Count summaries are reported with or without the DN listings.

Ref: BC1706 FDOC
GFX710AA - LEAS

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	DNPIC BULK DMO TOOL
Feature no	F6263

FEATURE SYNOPSIS

This feature creates a command which simplifies the initial datafill process for table DNPIC. The command, DNPICDMO, generates a bulk data modification order (DMO) file which can later be verified and/or processed as table input. DNPICDMO is useful when a range of consecutive DNs are to be datafilled in table DNPIC with identical field values.

FEATURE DESCRIPTION

Table DNPIC was developed as a means of storing equal access (EA) subscriber data in the DMS-200 access tandem (AT). DNPIC contains the following information:

- DNKEY : Directory Number
- DNPIC : Primary Carrier
- CHOICE : Indicates the ability to select a carrier on a per call basis
- CTD : Carrier Toll Denial

Currently table DNPIC is included in two products:

- LATA Equal Access System (LEAS) - NTX710AA
- TOPS InterLATA Carrier Service (TICS) - NTX714AA

These products require that EA subscriber data be resident in the AT.

Due to the sheer size of table DNPIC (maximum 1 million tuples), DNPICDMO command was conceived to ease the datafill and testing process. It allows the user to generate a bulk DMO file for the addition of up to 10,000 DNPIC tuples over a consecutive range of DNs within a single NPA-NXX. For each DN in the specified range DNPICDMO will generate a DMO with identical values for fields DNPIC, CHOICE and CTD. Fields DNPIC and CHOICE are specified by the user, a default of N is always supplied for CTD. The output of this command can be directed to any output device for storage and subsequent input processing and verification. DNPICDMO does not directly modify table DNPIC. The DMOPRO command does that.

The range of DNs within an NPA-NXX is specified by two values: from - XXXX, to - XXXX.

Ref: GFX710AA, GFX714AA, AF0305

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LATA EQUAL ACCESS SYSTEM
Feature	SUPER CAMA TRAVER HANDLING
Feature no	F6264

FEATURE SYNOPSIS

This feature enhances the translation verification (TRAVER) tool to include the examination of translation and routing data for calls incoming on superCAMA trunks requiring LATA equal access system (LEAS) handling.

FEATURE DESCRIPTION

This feature is one of eight features that comprise the LEAS package NTX710AA, which resides in a DMS-200 access tandem (AT) switch. LEAS provides equal access like service to non confirming offices (NCEO) subtending the AT.

The purpose of this feature is to modify the TRAVER tool to allow examination of data associated with LEAS translation and routing. LEAS call handling is provided only for calls incoming over superCAMA or TOPS trunks. Since TRAVER does not support incoming TOPS call processing, this feature only provides LEAS TRAVER handling when the originator is a superCAMA trunk.

The LEAS TRAVER is similar to teh EAE0 TRAVER with the addition of tracing tables used only in the AT. These tables are TRKLATA and DNPIC.

The TRAVER command syntax is unchanged by this feature, but three optional parameters are necessary to ensure proper handling of the LEAS call.

Ref: GFX710AA, AF0306

Package	NTX710AA02 LATA EQUAL ACCESS SYSTEM
Feature set	LEAS
Feature	LEAS-SPECIAL DIRECTORY NUMBER IDENTIFICATION
Feature no	G0117

Synopsis

This feature allows the non-TOPS LEAS access tandem to identify calls from coin, hotel, and non-coin public lines when a non-conforming end office cannot send Automatic Number Identification (ANI) information digit or Start Pulse (ST) digit. LEAS uses the line type of the call to construct the proper single or double ANI digit. The call can then be routed either to a TOPS access tandem or to an interexchange carrier.

Implementation

New table SPLANILN contains the DNs and type of DN: COIN (coin), HOT (hotel), RSP (coinless public line), or RSPCO (restricted coin line). Only SuperCAMA trunks need to use table SPLANILN.

New field SPLOOKUP in table TRKGRP indicates whether to lookup the type of DN in table SPLANILN. This field is set to 'Y' or 'N'.

The TRAVER (translation verification) CI command now displays the data from table SPLANILN if SPLOOKUP in table TRKGRP = 'Y'. If no data is found, 'TUPLE NOT FOUND' is displayed.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX072AA International Direct Distance Dialing (IDDD)
NTX801AA Toll Features I
either NTX187AATOPS - Equal Access
or NTX386AAAccess Tandem Switch

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

Non-LEAS offices with incoming SuperCAMA trunks will see the new field in the SuperCAMA trunk group data. Set SPLOOKUP = 'N' for these trunks.

Limitations

This feature is not supported for AMR5 signaling.

Reference: FDOC AF1453

NTX711AA02 Status: A+M EQUAL ACCESS END OFFICE ENHANCEMENTS(UPG

ADMINISTRATION	:	
EA PRESUBSCRIPTION REPORTS	:	F2772
EQUAL ACCESS	:	
PRESUBSCRIPTION INDICATOR	:	F2886

Package	NTX711AA02 EQUAL ACCESS END OFFICE ENHANCEMENTS(UPG.BY NTX711
Feature set	ADMINISTRATION
Feature	EA PRESUBSCRIPTION REPORTS
Feature no	F2772

FEATURE SYNOPSIS

This feature provides a new CI command which, when invoked from the MAP, generates and equal access presubscription report.

FEATURE DESCRIPTION

Entering the PICLIST command yields a listing of subscriber DNs grouped by their presubscribed primary interLATA carriers. Totals are provided for each carrier. DNs with no associated PIC may also be listed and tallied with the default carrier indicated.

IBN lines and P2/Px trunks are excluded from the listings and the totals.

Party lines and hunt group members are included.

Ref:

BR0772 FDOC

FSD 20-24-000 IC/INC Interconnection

NTP 297-1001-181 DMS-100 Equal Access Description

Package	NTX711AA02 EQUAL ACCESS END OFFICE ENHANCEMENTS(UPG.BY NTX711
Feature set	EQUAL ACCESS
Feature	PRESUBSCRIPTION INDICATOR
Feature no	F2886

FEATURE SYNOPSIS

This feature provides an indication to the IC/INC as to whether or not the calling station is presubscribed to that carrier.

FEATURE DESCRIPTION

This feature gives the operating telco the ability to forward a presubscription indication to the IC/INC.

The indication is passed to the IC/INC in the form of a modified KP pulse (KP1) in the ANI sequence.

A new field is a boolean that can be set to 'Y' to indicate that the IC/INC wishes to receive the indication, or 'N' to indicate that the carrier does not wish to receive the indication, in which case there will be no change in the outpulsing to the carrier. When the field is set to 'Y' and the calling station dialled 10XXX and is not presubscribed to that carrier, the KP signal preceding the calling number is replaced with KP1.

Ref: GFX711AA EAEO Enhancements AF0170 FDOC

NTX711AB02 Status: RTM EQUAL ACCESS END OFFICE ENHANCEMENTS (UP)

ADMINISTRATION	:	
EA PRESUBSCRIPTION REPORTS		F2772
EQUAL ACCESS	:	
PRESUBSCRIPTION INDICATOR		F2886
EQUAL ACCESS END OFFICE(EAEO)	:	
EA PRESUBSCRIPTION REPORTS ON IBN		F2910
EQUAL ACCESS	:	
EQUAL ACCESS MULTIPARTY LINE IDENTIFICATION		G0052

Package	NTX711AB02 EQUAL ACCESS END OFFICE ENHANCEMENTS (UPG. OF NTX7
Feature set	ADMINISTRATION
Feature	EA PRESUBSCRIPTION REPORTS
Feature no	F2772

FEATURE SYNOPSIS

This feature provides a new CI command which, when invoked from the MAP, generates and equal access presubscription report.

FEATURE DESCRIPTION

Entering the PICLIST command yields a listing of subscriber DNs grouped by their presubscribed primary interLATA carriers. Totals are provided for each carrier. DNs with no associated PIC may also be listed and tallied with the default carrier indicated.

IBN lines and P2/Px trunks are excluded from the listings and the totals.

Party lines and hunt group members are included.

Ref:

BR0772 FDOC

FSD 20-24-000 IC/INC Interconnection

NTP 297-1001-181 DMS-100 Equal Access Description

Package	NTX711AB02 EQUAL ACCESS END OFFICE ENHANCEMENTS (UPG. OF NTX7
Feature set	EQUAL ACCESS
Feature	PRESUBSCRIPTION INDICATOR
Feature no	F2886

FEATURE SYNOPSIS

This feature provides an indication to the IC/INC as to whether or not the calling station is presubscribed to that carrier.

FEATURE DESCRIPTION

This feature gives the operating telco the ability to forward a presubscription indication to the IC/INC.

The indication is passed to the IC/INC in the form of a modified KP pulse (KP1) in the ANI sequence.

A new field is a boolean that can be set to 'Y' to indicate that the IC/INC wishes to receive the indication, or 'N' to indicate that the carrier does not wish to receive the indication, in which case there will be no change in the outpulsing to the carrier. When the field is set to 'Y' and the calling station dialled 10XXX and is not presubscribed to that carrier, the KP signal preceding the calling number is replaced with KP1.

Ref: GFX711AA EAO Enhancements AF0170 FDOC

Package	NTX711AB02 EQUAL ACCESS END OFFICE ENHANCEMENTS (UPG. OF NTX7
Feature set	EQUAL ACCESS END OFFICE(EAEO)
Feature	EA PRESUBSCRIPTION REPORTS ON IBN
Feature no	F2910

FEATURE SYNOPSIS

This feature provides a new CI command which generates an equal access (EA) presubscription report for IBN lines and PBX trunks.

FEATURE DESCRIPTION

Prior to this feature presubscription reports were available for POTS lines only using the CI command PICLIST. Likewise, presubscription reports for LATA equal access system (LEAS) in DMS-200 access tandem could be obtained using the CI command DNPICLIST.

This feature extends the original EA presubscription report feature to IBN lines and PBX trunks by adding the CI command IBNPICLIST. The IBNPICLIST command yields a listing of IBN directory numbers (DN) and line equipment numbers (LEN) and P2/PX billing numbers (BILLNUM) and common language location identifier (CLLI) grouped by primary interLATA carriers (PIC). Totals are provided for each IC/INC.

Ref: DDOC AL0289

Package	NTX711AB02 EQUAL ACCESS END OFFICE ENHANCEMENTS (UPG. OF NTX7
Feature set	EQUAL ACCESS
Feature	EQUAL ACCESS MULTIPARTY LINE IDENTIFICATION
Feature no	G0052

FEATURE SYNOPSIS

This feature allows multiparty line, in an Equal Access (EA) environment, to be routed to an operator position or default to a Centralized Automatic Message Accounting (CAMA) position for identification, before outpulsing to an interexchange carrier (IEC).

FEATURE DESCRIPTION

The Operating Company can specify, on a per carrier basis, whether to route EA multiparty Operator Number Identification (ONI) calls to the carrier or to an operator or CAMA position for identification before outpulsing to the carrier.

A field, ONISCRN, is added to the Other Common Carrier Information table (OCCINFO) to specify whether the IEC wants ONI traffic to be screened and sent to an operator or CAMA position for identification before outpulsing to the IEC. ONISCRN can be specified as 'Y' or 'N'.

If the field ONISCRN is set to 'N' the carrier can handle ONI traffic, and EA ONI traffic is routed to the carrier. If the field ONISCRN is set to 'Y' the carrier cannot handle ONI traffic, and EA ONI traffic is routed to an operator or CAMA position for identification before outpulsing to the carrier.

When the EA Multiparty Line Identification feature is not in the load, the new field ONISCRN of Table OCCINFO does not affect the routing of EA ONI calls.

Ref: FDOC AF1099

Package	NTX713AA01 LATA-WIDE CENTREX BILLING
Feature set	BILLING
Feature	LATAWIDE CENTREX BILLING
Feature no	F2857

FEATURE SYNOPSIS

This feature provides the telco with the capability of assigning a tandem tie trunk (TDMTT) option to incoming integrated business network (IBN) virtual facility groups (VFGs). This feature enhances the service feature field of Bellcore (BC) call code 032 (CC 032) to include information relating to the number of subscriber digits dialled. The combination of these two capabilities is referred to as Enhanced Call Code (ECC) 032 service.

FEATURE DESCRIPTION

This feature provides an operating company with a method of identifying Centrex users, which call any other Centrex user, on a five, six or seven digit dialled basis.

This feature effectively replaces point to point tie line facilities. VFGs are used to simulate tie line facilities in an ECC 032 service environment.

This feature applies to TDMTT calls which generate a BC automatic message accounting (AMA) CC 032. The NTP 297-1002-128 AMA Reference Manual (Bellcore format), section 7 describes CC032 generation.

The TDMTT VFG option applies only to incoming IBN VFGs.

When the TDMTT and call detail recording (CDR) options are both assigned to a VFG, the TDMTT option will take precedence over the CDR option. The users of speed calling, the stored speed calling number is used to determine the digits dialled. The actual digits dialled will not be used to determine the digits dialled.

Package	NTX714AA01 TOPS INTERLATA CARRIER SERVICE
Feature set	SERVICES
Feature	TOPS INTERLATA CARRIER SERVICE
Feature no	F2855

FEATURE SYNOPSIS

Traffic Operator Position System (TOPS) inter local access and transport area (LATA) carrier service (TICS) allows operating telephone companies (OTCs) to provide operator services on a contractual basis to Interstate Carriers (ICs).

FEATURE DESCRIPTION

TICS allows OTCs to handle operator services for interlata calls originating from both conforming and non conforming end offices for ICs. It involves two parts: the IC and putting a new check into the call progression that determines if the OTC provides operator access for the IC. These two parts are independent of each other, and each can exist without each other.

a) Determine the IC

The IC method is done by obtaining through a directory number look up into the table DNPIC, or it is provided from incoming TOPS trunk group data in table TOPEATRK. The directory number look up (DN look) field is created to determine the method used.

b) Determine if Operator Services are provided for the IC:

Once an IC is associated with the Interlata call, the next step is to determine if operator services are provided for the IC. This is determined by a look up into TOPS Equal Access Carrier (TOPEACAR) table. Data, on a per carrier basis, is checked for operator services provided. Based on this information, one of three things can happen to the call: it can be forwarded to the IC (CAMA-type calls), it can be transferred to the IC, or it can be handled by the OTC operator.

- TOPS Equal Access Enhancements:

TICS provides the operator the ability to complete interlata calls. Developments are made to allow the operator to connect to an access to carrier (ATC) trunk. Either standard intertoll outpulsing is used in this section or outgoing FGD is used. A second enhancement is the ability to reserve a carrier number to designate the OTC as a primary IC. This is done to allow those public stations owned by the OTC to automatically route the operator or all interlata calls.

- Datas Schema

There are three new tables: PICNAME, DNPIC and TOPEACAR, and four existing tables are TRKGRP, OFRT, TOPEATRK and OFCVAR OFCENG. For more information relating to data input refer to NTP 297-2271-451.

Ref: AF0072

NTX717AB01 Status: RTM IBN TRK VERIFICATION DESIGNATED STN(UPGR

STATION FEATURES	:	
TRUNK VERIFICATION FROM DESIGNATED STATION		F2727
TANDEMING	:	
TRUNK VERIFICATION FROM DESIGNATED STATION II		F6275

Package	NTX717AB01 IBN TRK VERIFICATION DESIGNATED STN(UPGR.OF NTX	17
Feature set	STATION FEATURES	
Feature	TRUNK VERIFICATION FROM DESIGNATED STATION	
Feature no	F2727	

FEATURE SYNOPSIS

This feature provides the ability to select any trunk (excluding special trunks) within an SL-100 network from a designated 2500 or business set in order to subjectively verify transmission quality. The set should be assigned the appropriate customer designated network class of service (NCOS).

FEATURE DESCRIPTION

A craftsperson can use TVDS to test any CO or tie trunk that uses DP, MF or digitone signalling. Currently it cannot be used to test LAMA, CAMA, TSPS, TX, toll completing, intertoll, wats, or special test trunks e.g., paging, recorded announcements.

To utilize the TVDS feature, a craftsperson will go off hook on a designated TVDS station and dial the TVDS feature access code. He will hear the special dial tone prompt and should enter the desired trunk group number. If the number does not correspond to a valid trunk group CLLI in the CLLIMTCE table, negative acknowledgement treatment will be given and the feature will be taken down. If the trunk group number is valid, special dial tone will be heard as the prompt for the desired trunk member number. If the member number does not correspond to a valid member in the specified trunk group, negative acknowledgement treatment will be given and the feature will be taken down. Otherwise, special dial tone will be heard a third time as the prompt for the called number. After the called number has been entered, the crafts- person will hear busy tone if the specified trunk is call processing busy. If the trunk is maintenance busy or out of service, busy tone will also be heard. If the trunk is idle, it will be seized and the called number will be outputted. A flash while the TVDS feature is active will cancel the feature. This encompasses the time between dialing the TVDS access code and seizure of the outgoing trunk.

Package	NTX717AB01 IBN TRK VERIFICATION DESIGNATED STN(UPGR.OF NTX
Feature set	TANDEMING
Feature	TRUNK VERIFICATION FROM DESIGNATED STATION II
Feature no	F6275

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FEATURE SYNOPSIS

Trunk verification from designated station (TVDS) - II has enhanced and restructured the original TVDS feature. For ease of reading and simplicity this document will discuss TVDS as a single complete feature. TVDS was designed for the purpose of subjectively (by ear) verifying audible transmission quality on selected trunks. This feature lets a maintenance person use a phone to access specific trunks originating and terminating on a Meridian SL-100 PBX.

FEATURE DESCRIPTION

TVDS can be used from any directly terminated station (DP 2500 set, ETS station) or remotely via DISA on a tandemed invocation of TVDS on an incoming trunk (DT signalling sets only). Trunk access permission is provided by customer group through table TVDSTRKS. The user may tandem a single call over more than one trunk by invoking the TVDS feature over a succession of Meridian SL-100s.

TVDS may be originated on either a digitone or dial pulse phone. However, if the user wishes to originate the feature remotely via the DISA feature or tandem the feature over more than one switch, a digitone (DTMF) set will be required (2500 set, ETS station). TVDS uses indicative tones extensively to tell the user what's going on (prompting, trunk is busy, error, etc). The two unique tones are:

1) TVDS prompt tone - this is one of two different tones:

a) When TVDS is originated from a LINE, TVDS prompt tone is special dial tone. This is three short bursts of tone, followed by continuous tone.

b) When TVDS is remotely invoked via trunk (tandemed invocation or DISA invocation), TVDS prompt tone will be simple dial tone.

2) TVDS error tone - this is essentially double time recorder tone; reorder tone pulsing twice as fast (250 times a minute). Erroneous situation may be non-existent trunk group or member, hardware/resource allocation failure etc.

Access to the TVDS feature is on a NCOS basis. Also, the TVDS feature may also be available on a per customer group basis. It may also be invoked by dialing the TVDS access code. It may not be assigned as a feature key on an ETS. All line screening, customer group screening network management controls etc., will be ignored by TVDS.

Ref: Preliminary Feature Assessment for TVDS, received from B. Puelma,
NT, December 15, 1986
DID V0508 - DISA
DDOC BR0727

Package	NTX719AA01 BUSINESS SET BUSY INDICATOR
Feature set	BUSINESS SET FEATURES
Feature	BUSINESS SET BUSY INDICATOR
Feature no	F2863

FEATURE SYNOPSIS

The query busy station feature (QBS) will allow a group of business set users to monitor the busy/idle status of a specific set and to be alerted when that set becomes idle. This feature will provide a feature which meets the service need now fulfilled by the 1A key system's busy lamp field.

FEATURE DESCRIPTION

The user who monitors the designated station will require a business set with a feature key dedicated to the QBS feature. The key which is assigned must be one with an associated lamp. This key will be the QBS key. The monitored set may be a business set or an IBN 500/2500 set.

a) A user who needs to determine the status of any DN or line associated with the set of another user would depress the feature key assigned to QBS on his or her own set. This places the monitoring set in the monitor station mode.

b) If the monitored station is idle the lamp will flash at 60 IPM immediately and an optional 1 second burst of buzz tone will be given. After the 5 second timeout period the lamp will be extinguished and the station will exit the monitor mode.

c) If the monitored station is busy, the lamp will be turned on until that station becomes idle or the request is cancelled.

d) When the monitored station becomes idle, the lamp will flash and an optional 1 second burst of buzz tone will be given. After a 5 second timeout the lamp will be extinguished and the set will exit the monitor station mode.

e) A QBS request can be cancelled by depressing the QBS key while the lamp is illuminated.

One EBS can have multiple monitor keys for monitoring different sets. The operation of these keys may be concurrent.

The activation and deactivation of monitor will be allowed when calls are active on the monitoring set.

The maximum number of monitoring sets in the QBS group will be 128. Simultaneous monitors will be restricted to a maximum of 8 for messaging reasons. If the QBS key is depressed with 8 monitors already active for a

particular station, the QBS lamp will wink for 5 seconds. A winking lamp is activated at 120 IPM while a flash is at 60 IPM. No tones, announcements or treatments will be given over the speech path.

NTX724AA02 Status: RTM TOPS MP INTERFACE

INTERFACE	:	
TOPS V OPERATOR POSITION I/F		F5972
TPC-S/W	:	
TOPS V I/F - INCHARGE ASST. FORCE MGMT. POSITIONS		F5973

Package	NTX724AA02 TOPS MP INTERFACE
Feature set	INTERFACE
Feature	TOPS V OPERATOR POSITION I/F
Feature no	F5972

FEATURE SYNOPSIS

This feature implements changes to interface a TOPS MP position controller (TPC) controlling a toll and assist operator position to the central control (CC).

FEATURE DESCRIPTION

In the TOPS IV system data communication between the CC and positions is via asynchronous links. The CC transmits data to the TOPS IV position controller at 300 baud and receives data from the TOPS IV position controller at the same rate.

Messages are sent from the CC to the central message control (CMC), through the network, to a digital modem (DM) housed in a maintenance trunk module (MTM). There is one DM per TOPS IV position and a single MTM can hold 24 DMs. The DM buffers the message and sends it over an asynchronous path back through the network and out to a remote maintenance module (RMM) or trunk module (TM). The TM then sends the message to the NT4X71 controller which controls the TOPS IV position. The TOPS IV position can also be connected to the C by a channel bank terminating on a digital trunk control (DTC), digital carrier module (DCM), or line trunk controller (LTC).

In the TOPS MP system data communication between the CC and the TPC is also over asynchronous links. The TOPS MP configuration shown below is similar to the TOPS IV configuration, with the exception that the links from the TM or RMM terminate on the TPC. As in TOPS IV the TPC can also be connected to the CC by a DTC, LTC or DCM through a channel bank. The CC transmits data to the TPC at 1200 baud and receives data from the TPC at 300 baud. The TPC, a 68000 based system, handles the distribution of voice and data from the CC and manages the screen display for each of its positions. The TPC communicates with up to four TOPS MP positions over high speed proprietary links. Each position requires a separate link between the TM and the TPC.

In the TOPS IV system some messages sent by the CC to the position direct the position to display text at specific screen locations. In TOPS MP screen handling is done by TPC software. The TPC software translates TOPS IV messages into commands that build the M4010 screen. Therefore those TOPS IV messages that direct the positions to display text at various screen locations have no meaning to the M4010 and have been changed. Changing those messages creates a different protocol between the CC and TPC. The current TOPS IV protocol will remain unchanged.

This feature adds two new fields to table TOPSPOS. One field, CNTRLR, describes the type of position controller as either NT4X71, the TOPS IV controller, or TPC, the TOPS MP controller. The other field, LINKRATE, describes the transmission rate of the datalink between the CC and the position controller as either 300 baud or 1200 baud.

Ref: TOPS MP General Description NTP BC2143

Package	NTX724AA02 TOPS MP INTERFACE
Feature set	TPC-S/W
Feature	TOPS V I/F - INCHARGE ASST. FORCE MGMT. POSITIONS
Feature no	F5973

FEATURE SYNOPSIS

This feature implements the changes necessary to interface a TOPS MP position controller (TPC) which is controlling TOPS MP assistance in charge and force management positions to the central control (CC).

FEATURE DESCRIPTION

The TPC is a 68000 based system that controls up to four TOPS MP positions. It handles the distribution of voice and data from the CC and manages the screen display of each of its positions.

In the TOPS MP system data communication between the CC and the TPC is over asynchronous links, but the CC transmits data to the TPC at 1200 baud and receives data from TPC at 300 baud. The TOPS MP configuration, shown below, is similar to the TOPS IV configuration, with the exception that the links from the TM or RM terminate on the TPC instead of the M4010s. As in TOPS IV the TPC can also be connected to the CC by M4010s over high speed proprietary links. A single TPC and each position requires a separate link between the TM and the TPC.

In the TOPS IV system some messages sent by the CC to the TOPS IV position direct the position to display text at a specified location on its screen. But, in TOPS MP the CC does not know anything about locations on the M4010 screen because the M4010 screen handling is done by software in the TPC. This software takes TOPS IV messages and translates them into commands that build the M4010 screen. Those TOPS IV messages that refer to specific screen locations have no meaning for the TOPS MP screen and are changed, resulting in a different protocol between the CC and the TPC. The current TOPS IV protocol is unchanged. The CC software that sends screen update messages to position controllers decides whether to send TOPS IV messages or TOPS MP messages based on position controller type data filled in table TOPSPOS.

This feature adds two subfields to the DEVTYPE field of table TOPSDEV when DEVTYPE=FMCRT. One subfield, CNTRLR describes the type of position controller as either 300 baud or 1200 baud.

Ref: BC2144, F5912, TOPS MP GENERAL DESCRIPTION NTP

NTX727AA02 Status: RTM ACD LOAD MANAGEMENT

ADMINISTRATION	:	
ACD LOAD MANAGEMENT BASIC COMMANDS		F6207
LOAD MANAGEMENT	:	
ACD LOAD MANAGEMENT - ENHANCED COMMANDS		F6276

Package	NTX727AA02 ACD LOAD MANAGEMENT
Feature set	ADMINISTRATION
Feature	ACD LOAD MANAGEMENT BASIC COMMANDS
Feature no	F6207

FEATURE SYNOPSIS

The ACD Load Management system was developed to provide senior ACD supervisors with a secure and effective means of tailoring the current ACD configuration to better manage the daily work load demands of each specific ACD group.

FEATURE DESCRIPTION

This feature provides Command Increment (CI) commands which allow a senior supervisor to modify various ACD configuration parameters. Commands can only be executed from a Maintenance and Administrative Position (MAP) and are as follows:

- 1) Change the Maximum Wait (MAXWAIT) value for an ACD group (i.e., the maximum time a caller should wait before being presented to an agent position. Primarily used to control the overflow of calls on the extent of abandoned calls).
- 2) Change the Maximum Call Queue Size (MAXCQSIZE) for an ACD group (i.e., the number of calls that can be queued. Used in conjunction with MAXWAIT to provide an optimum call queue).
- 3) Change the Enhanced Overflow Route for an ACD group (i.e., specify 4 target ACD groups for overflow).
- 4) Change the Night Service Route (NSROUTE) for an ACD group.
- 5) Change the Threshold Route (THROUTE) for an ACD group (i.e., a route where calls would eventually overflow if Enhanced Overflow is not available or if Enhanced Overflow uses THROUTE as it's default).
- 6) Reassign an ACD agent position from an ACD group to another or to another subgroup within an ACD group.
- 7) Reassign an ACD agent position from one supervisory position to another.

This feature which allows configuration changes is intended to be used in conjunction with the configuration display feature ALDSHOW. Load Management commands cannot be executed unless ACDSHOW is in the current load.

Ref: DDOC AD0056

Package	NTX727AA02 ACD LOAD MANAGEMENT
Feature set	LOAD MANAGEMENT
Feature	ACD LOAD MANAGEMENT - ENHANCED COMMANDS
Feature no	F6276

FEATURE SYNOPSIS

ACD load management provides the capability to senior supervisors to display and anipulate the ACD configuration for which they are respon- sible. ACD load management enhanced commands now allows the senior supervisor to use the following new ACD command:

- reassign an ACD directory number to another ACD group,
- change the audio group that is used to give announcement to callers in the incoming call queue,
- change the RANTH setting in an ACD group,
- change the priority of the ACD directory number
- display the announcement CLLIs (comon language location identifier) which are used by an audio group in table AUDIO,
- display the name of the audio group which is used to give announcement to callers in the incoming call queue.

FEATURE DESCRIPTION

ACD load management works in conjunction with ACDSHOW which allows the senior supervisor to display a variety of pertinent ACD information. Based on the display of current information, the senior supervisor may now use LOADMGMT commands to change ACD group parameters to effect ACD recon- figuration. As ACD load management commands may permanently alter an ACD configuration, changes are recorded in the journal file.

Ref: DDOC AD0180

NTX727AC01 Status: RTM ACD LOAD MANAGEMENT II

ADMINISTRATION	:	
ACD LOAD MANAGEMENT BASIC COMMANDS		F6207
SECURITY	:	
ACD CONFIGURATION SECURITY		F6426

Package	NTX727AC01 ACD LOAD MANAGEMENT II
Feature set	ADMINISTRATION
Feature	ACD LOAD MANAGEMENT BASIC COMMANDS
Feature no	F6207

FEATURE SYNOPSIS

The ACD Load Management system was developed to provide senior ACD supervisors with a secure and effective means of tailoring the current ACD configuration to better manage the daily work load demands of each specific ACD group.

FEATURE DESCRIPTION

This feature provides Command Increment (CI) commands which allow a senior supervisor to modify various ACD configuration parameters. Commands can only be executed from a Maintenance and Administrative Position (MAP) and are as follows:

- 1) Change the Maximum Wait (MAXWAIT) value for an ACD group (i.e., the maximum time a caller should wait before being presented to an agent position. Primarily used to control the overflow of calls on the extent of abandoned calls).
- 2) Change the Maximum Call Queue Size (MAXCQSIZE) for an ACD group (i.e., the number of calls that can be queued. Used in conjunction with MAXWAIT to provide an optimum call queue).
- 3) Change the Enhanced Overflow Route for an ACD group (i.e., specify 4 target ACD groups for overflow).
- 4) Change the Night Service Route (NSROUTE) for an ACD group.
- 5) Change the Threshold Route (THROUTE) for an ACD group (i.e., a route where calls would eventually overflow if Enhanced Overflow is not available or if Enhanced Overflow uses THROUTE as it's default).
- 6) Reassign an ACD agent position from an ACD group to another or to another subgroup within an ACD group.
- 7) Reassign an ACD agent position from one supervisory position to another.

This feature which allows configuration changes is intended to be used in conjunction with the configuration display feature ALDSHOW. Load Management commands cannot be executed unless ACDSHOW is in the current load.

Ref: DDOC AD0056

NTX727AD01 Status: RTM ACD - LOAD MANAGEMENT III

ADMINISTRATION	:	
ACD LOAD MANAGEMENT BASIC COMMANDS		F6207
LOAD MANAGEMENT	:	
ACD LOAD MANAGEMENT - ENHANCED COMMANDS		F6276
SECURITY	:	
ACD CONFIGURATION SECURITY		F6426
ACD CONFIGURATION SECURITY ENHANCEMENT		F6430

Package	NTX727AD01 ACD - LOAD MANAGEMENT III
Feature set	ADMINISTRATION
Feature	ACD LOAD MANAGEMENT BASIC COMMANDS
Feature no	F6207

FEATURE SYNOPSIS

The ACD Load Management system was developed to provide senior ACD supervisors with a secure and effective means of tailoring the current ACD configuration to better manage the daily work load demands of each specific ACD group.

FEATURE DESCRIPTION

This feature provides Command Increment (CI) commands which allow a senior supervisor to modify various ACD configuration parameters. Commands can only be executed from a Maintenance and Administrative Position (MAP) and are as follows:

- 1) Change the Maximum Wait (MAXWAIT) value for an ACD group (i.e., the maximum time a caller should wait before being presented to an agent position. Primarily used to control the overflow of calls on the extent of abandoned calls).
- 2) Change the Maximum Call Queue Size (MAXCQSIZE) for an ACD group (i.e., the number of calls that can be queued. Used in conjunction with MAXWAIT to provide an optimum call queue).
- 3) Change the Enhanced Overflow Route for an ACD group (i.e., specify 4 target ACD groups for overflow).
- 4) Change the Night Service Route (NSROUTE) for an ACD group.
- 5) Change the Threshold Route (THROUTE) for an ACD group (i.e., a route where calls would eventually overflow if Enhanced Overflow is not available or if Enhanced Overflow uses THROUTE as it's default).
- 6) Reassign an ACD agent position from an ACD group to another or to another subgroup within an ACD group.
- 7) Reassign an ACD agent position from one supervisory position to another.

This feature which allows configuration changes is intended to be used in conjunction with the configuration display feature ALDSHOW. Load Management commands cannot be executed unless ACDSHOW is in the current load.

Ref: DDOC AD0056

Package	NTX727AD01 ACD - LOAD MANAGEMENT III
Feature set	LOAD MANAGEMENT
Feature	ACD LOAD MANAGEMENT - ENHANCED COMMANDS
Feature no	F6276

FEATURE SYNOPSIS

ACD load management provides the capability to senior supervisors to display and manipulate the ACD configuration for which they are responsible. ACD load management enhanced commands now allows the senior supervisor to use the following new ACD command:

- reassign an ACD directory number to another ACD group,
- change the audio group that is used to give announcement to callers in the incoming call queue,
- change the RANTH setting in an ACD group,
- change the priority of the ACD directory number
- display the announcement CLLIs (common language location identifier) which are used by an audio group in table AUDIO,
- display the name of the audio group which is used to give announcement to callers in the incoming call queue.

FEATURE DESCRIPTION

ACD load management works in conjunction with ACDSHOW which allows the senior supervisor to display a variety of pertinent ACD information. Based on the display of current information, the senior supervisor may now use LOADMGMT commands to change ACD group parameters to effect ACD reconfiguration. As ACD load management commands may permanently alter an ACD configuration, changes are recorded in the journal file.

Ref: DDOC AD0180

Package	NTX727AD01 ACD - LOAD MANAGEMENT III
Feature set	SECURITY
Feature	ACD CONFIGURATION SECURITY ENHANCEMENT
Feature no	F6430

FEATURE SYNOPSIS

The Automatic Call Distribution Configuration Security Enhancement feature is a method of restricting authorized personnel to using only specified routing table entries for ACD Threshold and Night Service routes. It will also restrict which audio groups can be used to give announcements to callers in the incoming call queue by allowing only certain audio table entries to be used by a given ACD group.

FEATURE DESCRIPTION

This feature enhances the ACD Configuration Security feature which allows an authorized user the capabilities of performing ACDSHOW and ACD Load Management functions for a collection of ACD groups. Load Management, Remote Load Management and ACDSHOW are affected as follows:

MAP Load Management

A senior supervisor is responsible for one ACD administration group at a time. An ACD group can only belong to one ACD administration group at a time. However, the current Load Management commands which change threshold route (THROUTE), night service route (NSROUTE), and audio (AUDIO) information for ACD groups violate these administration group boundaries. Currently, senior supervisors have the ability to route to entries that are outside of their administration groups and to utilize any audio group datafilled in the AUDIO table.

This feature will add checks into the existing features to prevent this from occurring. In order for a senior supervisor to be able to change routing or audio information for an ACD group, the requested change must match one of the entries in the table ACDGRP. If no match is found, the request will be denied. Up to ten valid routing table entries and up to eight valid audio table entries can be specified for each ACD group.

Remote Load Management

This feature will place restrictions on Remote Load Management Commands in much the same manner as it handles MAP Load Management commands with a few exceptions.

Administration groups are not present for remote commands. Instead, pools and subpools have been defined to handle switch and ACD customer security. Pools are used to partition ACD groups between data streams. Groups from different customer groups can be in the same pool. Subpools are used to implement customer security. Typically, all ACD groups belonging to an ACD customer will be grouped within the same subpool. Thus, subpool restrictions will be placed on groups for remote operations in much the same

manner as administration group restrictions are placed on groups for MAP commands.

ACDSHOW

Senior supervisors will only be able to display valid routes and audio entries for groups in their administration group.

Ref: FDOC - AD0621

Package	NTX730AA02 MULTILINK ASCII DEVICE DRIVER
Feature set	FACILITY
Feature	MULTILINK ASCII DEVICE DRIVER
Feature no	F6175

FEATURE SYNOPSIS

This feature allows the package NTX730AA to contain utility software to be used by NTX417AA (ACD management reports) and NTX728AA (SMDR Data Access). This feature is strictly to support packaging requirements.

FDOC AD0366

NTX731AA03 Status: RTM TOPS MP - TERMINAL HANDLER

TPC-S/W	:	
TERMINAL HANDLING S/W FOR TOPS MP		F5974
TPC DIAGNOSTICS		F5976
TPC DRIVERS		F5977
TPC TUTOR I/F		F5978
TPC DEBUG TERMINAL HANDLE		F5979
TPC SYSTEM SUPPORT		F5980
TPC ADMINISTRATION		F5981
TOPSMP1	:	
ENHANCED MAINTENANCE FOR TPC RACKMOUNT		F6508
TPC-S/W	:	
REMOTE SONALERT FOR TOPS-MP		F7204
TPC S/W	:	
OPERATOR LOGON PASSWORD FOR TOPS-MP		F7210

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	TERMINAL HANDLING S/W FOR TOPS MP
Feature no	F5974

FEATURE SYNOPSIS

Provide the man-machine interface for the TOPS V TPC. Includes interface to alpha terminal, and encoding/decoding terminal commands from the CC and interfacing applications within the TPC with the OI (operator interfaces). It is also used by all applications version I and beyond that require access to the MP.

FEATURE DESCRIPTION

Terminal handling software consists of the OI. The OI resides between the lower level M4010 terminal i/o driver and the higher level application tasks that use the MP. Two major components of the OI are the TH and the TOPS call processing application.

The TH is the application independent core of the TPC. It is responsible for maintaining logical screen images for all of the screens, accepting screen update requests from applications, sending keyboard input to applications and switching screens whenever activity changes from one application to another ("context switching"). The TH also introduces conventions followed by all applications in the TOPS MP for creating and maintaining screens.

The call processing application uses the TH to perform screen handling for the TA, assistance, in-charge, and force management positions.

Keyboard:

The MP keyboard contains 126 keys including the standad QWERTY set, softkeys, customer definable hardkeys, call processing hardkeys, a dial pad, and undefined keys reserved for future applications. Keys are grouped conveniently to minimize the time spent typing. The call processing area is also highlighted by a shaded area to easily distinguish it from the rest of the keyboard.

Softkeys are a valuable addition to TOPS because they are context dependent. Applications can dynamically update them as state changes occur. Softkeys allow new key functions to be added without modifying the keyboard and reduce extraneous keying. These are two important advantages over TOPS IV.

MP Screen Formats:

Version one of TOPS MP implements screens for the TA, assistance, in-charge, and force management positions. These screens make use of the greyscales feature of the M4010.

The M4010 display matrix is 29 rows by 90 columns, five rows more than the usual 24 found on most displays. (Note: the number of columns may be reduced to 80 in order to provide a wider character matrix than the standard 8x12 that the M4010 currently supports.) The system status area appears in the top three rows and the eight softkeys are displayed in the bottom two rows. The remaining 24 rows provide standard screen dimensions for applications.

The call processing area contains several fields for displaying and entering toll and assist information such as calling/called numbers, and class charging.

A functions menu pops up in the menu and services selections whenever the functions key is hit. This menu contains a numbered list of functions. Using the numeric identifier the operator can select a desired function. Basically, the functions menu is a list of infrequently used "keys" such as logout or start timing that are not used often enough to be hardkeys. If the customer decides that some of the functions are important enough to be accessed as hardkeys six customer definable hardkeys can be assigned to functions listed in the functions menu. The functions also provides another way of adding new functions without having to modify the keyboard.

Note: The services menu is reserved for later phases of TOPS MP to gain access to local and remote database applications such as multileaf and directory assistance.

The forms area is used to display information such as charge, rate and route, or overseas information. The forms and functions areas overlap the lower right quadrant of the display.

Ref: F5972 TOPS MP OPERATOR POSITION I/F

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	TPC DIAGNOSTICS
Feature no	F5976

FEATURE SYNOPSIS

This feature provides diagnostics for the TOPS position controller (TPC) hardware. It is used during testing for product verification, field support to diagnose and localize problems in the field, and the operating company's administration to verify the hardware when problems arise.

FEATURE DESCRIPTION

This feature tests the functioning of the following components:

- TOPS/HSLI card.
- Floppy drive, controller, and its parallel I/O interface.
- Winchester drive, controller, and its parallel I/O interface.
- MP terminal (software-generated screen patterns test the CRT display, a manual diagnostic tests the keyboard, and terminal component diagnostics test the base unit).

Note: Diagnostics for the processor card and memory card are implemented in and run from read only memory (ROM).

This feature is available either as a standalone software package run off a floppy disk or as part of the TPC application package under the control of TPC administration. The standalone package is for the installer running the diagnostics in the commissioning mode, or the administrator performing disk diagnostics. In both cases, diagnostics are chosen and invoked by means of a man-machine interface accessed through the TPC administration and maintenance interface (TAMI) port, on the TPC. There is a set of diagnostic tests for each major component of the TPC.

If the diagnostics are invoked from the TPC administration program (administrator mode), only those positions that are maintenance busy (at the MAP and TPC administration) are available for testing. Winchester and floppy diagnostics must be run from the standalone floppy set, thus requiring that all positions controlled by the TPC are maintenance busy.

If diagnostics are invoked by the installer (commissioning mode), all positions that have corresponding hardware present are available for testing, and the content changing (extensive) diagnostics for the Winchester and floppy components are also available.

Ref: BC2141, GFX731, NTP on TOPS MP Maintenance Reference Manual and Administration Reference Manual

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	TPC DRIVERS
Feature no	F5977

FEATURE SYNOPSIS

Provides the interrupt handler and driver for four NT4X82AA cards, which contain the interface to the CC, Tutor III B and MP (4010) terminals.

FEATURE DESCRIPTION

TOPS MP offers a new generation of operator positions which use M4010 terminals. A M4010 can function as toll and assist, in charge, assistant or a force management position. In TOPS IV each type of position uses a separate terminal.

The TPC supports a hard disk of maximum capacity 80 megabytes, an eight inch floppy disk drive, and interfaces to command four M4010s, four DMS trunk pairs, up to four TUTOR IIIB's, a VT100 compatible terminal and a serial printer.

The software that control access to the external hardware devices resides in the TPC operating system. This software control access to the TUTOR IIIB, DMS-200 network and the four M4010s.

TPC drivers provides an optimum interface to the call processing application program. TPC drivers are responsible for transmitting data from the call processing application to an appropriate hardware device like TUTOR IIIB and vice versa.

Ref: BC2142, TOPS MP GENERAL DESCRIPTION FOR TPC

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	TPC TUTOR I/F
Feature no	F5978

FEATURE SYNOPSIS

This feature integrates the existing Tutor 3B training system with TPS MP. It resides in the TPC and does not require any changes to the Tutor Training system.

FEATURE DESCRIPTION

The Tutor training system simulates live operator traffic by presenting calls to the trainee. Call voice and call data are stored on a cassette tape played by the Tutor. The Tutor processes the call data and presents the data to the TOPS terminal so that the screen updates are synchronized with the call voice, providing the trainee with a realistic call scenario.

Tapes:

The tapes are standard two-track cassette tapes. One track is used for data while the other track is reserved for voice. The call information containing voice and data is recorded on the tapes by the tape maker. The data is a processed version of a script that is generated by NT's training department, and the voice is that of actors reading the scripts.

Scripts:

In addition to containing the actors' words, the script contains the data to be displayed on the terminal, the synchronization information that is required for those displays, the the trainees expected keying actions with the Tutors reactions to the keying.

Tutor Interface Software (TIS):

In the TOPS IV system, the Tutor 3B communicates with the trainee using TOPS IV keystrokes (from the trainee) and TOPS IV commands (from the Tutor). With TOPS MP, there are additional commands that may be sent from the CC. To avoid making hardware changes in the Tutor, the TIS is required to integrate the function of the Tutor with the additional TOPS MP commands and the TOPS MP keyboard.

As previously mentioned, the Tutor training system simulates live operator traffic by presenting calls to the trainee. The call data, which contains the proper keystroke responses to the voice stimulus, is presented to TIS by the Tutor. TIS is responsible for determining if the trainee's keystrokes, which are presented to the TIS via the OI, are correct. If all stimulus response(s) are correct, the trainee advances to the next call segment. If the response(s) are incorrect, the expected response is pre-

sented to the trainee as a prompt to enter the correct keystrokes. The Tutor is informed of the mistake so that it can track the number of trainee errors.

Ref: BC2145

F5974 - TPC OPERATOR I/F & FM POSITION

F5981 - TOPS MP ADMINISTRATION

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	TPC DEBUG TERMINAL HANDLE
Feature no	F5979

FEATURE SYNOPSIS

This feature provides an interface to a debug terminal including utilities for character conversion.

FEATURE DESCRIPTION

The TPC debug terminal handler provides some debugging tools for use by the designer and the field support personnel. This feature provides for the inputting and outputting of integers that can be accompanied by a descriptive phrase. An interface is also provided for the designer to use the debug terminal handler facilities for "custom" designer-supplied procedures, typically used for displaying data structures.

For debugging the multi-tasking software, the operating system kernel provides for task communication message buffering, thus guarantying that calls to the debug routines are not "blocked". The system software also provides routines for hexadecimal, decimal, string, and integer conversion to any of the other formats.

A form of program flow tracing is also provided. Debug statements of different depths can be activated by setting a debug level flag. Debug messages can be sent on a task basis down to changes in any variables.

Ref:

BC2146
F5974 Terminal Handling Software for TOPS MP
F5977 TPC Drivers
F5972 TOPS V Operator Position Interface
F5973 TOPS V Interface - Incharge, Assistant, Force Management

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	TPC SYSTEM SUPPORT
Feature no	F5980

FEATURE SYNOPSIS

This feature provides TPC software:

1. Support for the TPC.
2. Read only memory (ROM) modification and additions.
3. Software initialization, supervision, error detection and recovery.

FEATURE DESCRIPTION

The ROM software in the TPC consists of the following:

1. Power-up (or reset) initialization of software including diagnostics that check the processor, the ROM image, and the RAM operation. If an error occurs a code is displayed on the LED display and an attempt is made to display an error message on the TOPS administration and maintenance interface (TAMI) terminal. The error message may not be displayed on the TAMI terminal if the nature of the error is such that the output software does not work properly.
2. Exception handling software for when ROM software is executing.
3. A ROM monitor that provides commands to display and change memory contents and access (virtual addressing), display and change processor register contents, a debug 68000 code, run diagnostics on TPC hardware, and the ability to boot-up the system.
4. Software to auto-boot the system after power-up or reset.

Initialization, Supervision, and Error Detection and Recovery:

The auto-boot feature of the ROM software loads the booting software from the boot track of the boot device. The booting software loads the operating system program (OSP) including the hardware drivers from the boot volume. The OSP then invokes the TPC supervisor program. The supervisor:

1. Creates the environment in which programs run.
2. Initially invokes the rest of the programs that comprise the TOPS TPC software.

3. Handles the termination of programs, generating log messages and re-starting the programs as required.

4. Processes requests from the TPC Maintenance and Administration program to start, stop, read attributes, write attributes, and query information for an operator position control (OPC) program.

Ref: BC2157, GFX731

NTP MP General Description and Administration Reference Manual

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	TPC ADMINISTRATION
Feature no	F5981

FEATURE SYNOPSIS

TOPS MP consists of multiple TOPS Position Controllers (TPC), each providing four operator positions. This feature provides a TPC administration and maintenance interface (TAMI) for each TPC:

1. Installing initial and subsequent TOPS S/W releases.
2. Detecting and repairing hardware troubles.
3. Examining TPC error log messages.
4. Programming customer definable hard keys.
5. Providing remote access to the TPC.
6. Configuring positions for toll and assist, force management, in-charge and assistance.
7. Defining the out trunks service list.

FEATURE DESCRIPTION

TPC administration and maintenance is accessible locally via the TAMI port and remotely over telephone lines via an auto-answer modem plugged into TAMI port. These are referred to as the local TAMI and as the remote TAMI.

The administrator can examine the error logs generated and stored on the hard disk by the TPC from TAMI terminal. Error logs indicate which software component in the TPC detected the error and the cause of the error.

The TPC can hold a maximum of fifty log messages at a time. Exceeding this limit results in the overwriting of the least recent log messages. Log messages are not accessible from the DMS Maintenance and Administration Position (MAP). The Man Machine Interface (MMI) at the TAMI terminal includes commands for examining, printing and deleting error logs. To print error logs, a printer should be plugged into the printer port on the TPC and the appropriate print commands should be issued using the MMI.

Trouble Shooting:

When a TPC partially fails and some operator positions are still operational, the administrator can use the TAMI terminal to detect the problem and restart the operator positions after they have been repaired or replaced. Position, hard disk, and disk errors are considered partial failures of a TPC. When a complete TPC failure occurs and all the operator positions seem to malfunction, the administrator should power down the TPC and power it up again to reboot. All TPC hardware errors will then be displayed on the TAMI terminal during TPC booting. Detailed diagnostics

may be run if the information displayed on the TAMI terminal is insufficient and the problems still exist.

Programming Customer Definable Keys:

The TOPS MP operator interface involves using a pop-up window for call processing functions because some call processing functions are used more often than others. The operating company has the option of programming six hard keys to correspond to six frequently used call processing functions. Note all functions are still accessible through the pop-up window.

The MM at a TAMI terminal includes commands that allow an operating company administrator to program hard keys on one TPC and copy them to all his TPCs by using a floppy disk containing the hard key definitions. It is totally up to the operating company.

Remote Access:

Remote access allows those at remote sites to investigate a problem by dialing into the TPC using a VT100 compatible terminal configured at the baud rate of 1200 as a remote TAMI and checking TPC error logs. The NT Technical Assistance and Support group (TAS) can be a great help to the operating company by quickly detecting the problem and restarting the operator positions in error. The operating company should keep at least one 1200 baud modem with auto-answer feature to use for remote TAMI terminals.

Configuring TPC Positions:

TOPS office hostadministrative positions such as Force Management, In Charge and Assistance in addition to the toll and assist (regular operator) positions. These positions allow administrative activities to be distributed over several TPCs instead of to a TAMI terminal allowing administrative activities for its own TPC only. Each position is datafilled in the position configuration tables called TOPSPOS and TOPSDEV using the DMS CC MAP to be of toll and assist or of a particular administrative type.

While TOPS IV uses specialized positions for Force Management, In Charge and Assistance, the M4010 in TOPS MP can be configured to operate for toll and assist or for administration. In TOPS MP version 1, there is no mechanism for the DMS central control to inform a TPC of the configuration of its four M4010. However, a TPC administrator can use the TAMI on each TPC to define how each one of the M4010s is expected to be used. The administrator must be careful to maintain consistency with the configuration information defined in the DMS CC.

Defining Outtrunks Services List:

An OUTTRUNKS key on the MP keyboard allows frequently used numbers and emergency numbers to be dialed quickly by pressing the OUTTRUNKS key fol-

lowed by a number between 1 to 7. The services list is set up in the DMS CC from a MAP using the table OGTKEY.

The transfer keys can be assigned to the outtrunk keys 5 and 6.

Ref: BC2158
NTP 297-1001-510
GFX731

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TOPSMP1
Feature	ENHANCED MAINTENANCE FOR TPC RACKMOUNT
Feature no	F6508

FEATURE SYNOPSIS

TOPS Positive Controller (TPC) handles distribution of voice and data from the DMC Central Control (CC) and manages screen displays for up to four Multipurpose Positions (MP) in the TOPS MP system. At present, TPC houses four TOPS/HSLI cards, one per MP. The TPC main processor handles I/O (INPUT/OUTPUT) with each MP via the corresponding TOPS/HSLI card. This feature removes the restriction that locks up the TAMI while a print job is in progress.

FEATURE DESCRIPTION

TPC occupies a shelf in a PCE (position controller equipment), where each TPC consists of the following:

- 1-4 TOPS/HSLI cards (NX62AA)
- 1 parallel IO card (NX65AA)
- 1 memory card (NX63AA)
- 1 main processor card (NX64AA)
- 1 floppy disk drive (NX68AA)
- 1 hard disk drive (NX68BA)

Where parallel IO card provides interface to the floppy disk drive and the hard disk drive.

Ref: AF0732, NTP 297-2281-100

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC-S/W
Feature	REMOTE SONALERT FOR TOPS-MP
Feature no	F7204

Synopsis

This feature activates a remote indicator (lamp or tone) to alert operator office administrative personnel of calls or trouble conditions that occur while they are absent from their their incharge (IC), assistance (ASST), or force management (FM) positions.

Implementation

The local sonalert tone sounds at the ASST, IC, or FM position in a force management center or traffic office under the following conditions:

- * all time and charges positions out of order
- * assistance request arrival
- * calls in queue-no position occupied
- * assistance request queued
- * calls deflected
- * CAMA suspended
- * transfer call in queue-no transfer position occupied
- * 25⁴ controlled traffic

From the new TAMI screen the craftsperson can:

- * enable or disable the local or remote sonalert
- * turn on or off the local or remote sonalert

The following feature packages are necessary for this feature to operate in package NTXA90AA:

NTX000AA Bilge
NTX001AA Common Basic
NTXA62AA TOPS MP DA/Audio Response
NTX030BA TOPS ACD Features
NTX134BA Remote Operator Centralization Data Link Handling
NTX273AA Multi-protocol Controller BX.25
NTX645AA TOPS - Service Billing
NTX724AA TOPS MP Interface
NTX731AA TOPS Position Controller (TPC) Version I
NTX871AA Remote TOPS MP OC Data Link Handling
NTX892AA MPC Multilink Management
NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

The following feature packages are necessary for this feature to operate in package NTXA731A:

NTX000AA Bilge

NTX001AA Common Basic

NTX030BA TOPS ACD Features

NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

Pressing the STOP BELL softkey deactivates local sonalert. Deactivation is automatic if "calls deflected" caused the alert.

Remote sonalert on a TPC is activated if local sonalert is activated. The remote sonalert is deactivated when the last local sonalert on a TPC is deactivated.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

A multi-purpose position (MP) cannot respond to requests to turn its local sonalert on or off if the MP has not been loaded with the appropriate software.

Reference: FDOC AF1509

Package	NTX731AA03 TOPS MP - TERMINAL HANDLER
Feature set	TPC S/W
Feature	OPERATOR LOGON PASSWORD FOR TOPS-MP
Feature no	F7210

Synopsis

This feature provides an optional log-on password in addition to the operator identification log-on number for the TOPS MP position. This provides the operating company with additional security.

Implementation

Valid passwords consist of four to seven alphanumeric characters. The password entry field appears at the TOPS MP logon menu.

Users may modify passwords when they are in the "position busy" state.

Password usage is controlled at the FADS (force administration data system) or TADS (traffic office administration data system).

Office parameter TOPS_PASSWORD_ENABLE in table OFCENG is set to "Y" to activate this feature.

The following feature packages are necessary for this feature to operate in package NTXA90AA:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTXA62AA TOPS MP DA/Audio Response
- NTX030BA TOPS ACD Features
- NTX134BA Remote Operator Centralization Data Link Handling
- NTX273AA Multi-protocol Controller BX.25
- NTX645AA TOPS - Service Billing
- NTX724AA TOPS MP Interface
- NTX731AA TOPS Position Controller (TPC) Version I
- NTX871AA Remote TOPS MP OC Data Link Handling
- NTX892AA MPC Multilink Management
- NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

The following feature packages are necessary for this feature to operate in package NTXA731A:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX030BA TOPS ACD Features
- NTX030CC TOPS Call Processing Features (upgrade of NTX030CB)

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

This feature is not supported by the TOSS (traffic operator simulation system) and training features. In order to run TOSS, the password option must be disabled.

Reference: FDOC AF1463

NTX732AA02 Status: RTM SIMPLIFIED MESSAGE DESK INTERFACE(SMDI)

SERVICES	:	
SIMPLIFIED MESSAGE DESK INTERFACE (SMDI)		F2881
SMDI CALL RETRIEVAL BILLING		F2948

Package	NTX732AA02 SIMPLIFIED MESSAGE DESK INTERFACE(SMDI)
Feature set	SERVICES
Feature	SIMPLIFIED MESSAGE DESK INTERFACE (SMDI)
Feature no	F2881

FEATURE: F2881

TITLE: Simplified Message Desk Interface (SMDI)

FEATURE SYNOPSIS:

The SMDI feature consists of three major interfaces, Message Waiting (M), Datalink (D), and Call Forwarding (C). The contribution and interworking of each part is described below with reference to the letters C, M and D.

- Users can forward calls (C) to a message desk UCD DN.
- At the Message Desk Instruction (D), a message will be queued against the user and his MWI will be turned on providing he has the Message Waiting Feature. (M)
- The user can retrieve call messages by dialing the Message Desk UCD DN or the Call Request Retrieve feature access code.
- At the Message Desk Instruction (D), a message will be dequeued and the users MWI will be turned off.

FEATURE DESCRIPTION:

The three major interfaces of the SMDI feature are described below.

Message Waiting

The Message Waiting for SMDI feature utilizes the current functions of the MWT and CAR features, with the exception that the Message Desk Instruction to the DMS-100 for the activation/deactivation of the MWI is done over a 1200 baud, dedicated, full duplex data link. Further, the SMDI feature is associated with a datafilled DN of a UCD group in contrast to the normal MWT feature.

The user will not be able to differentiate a MWI that has been activated/deactivated by the MWT feature to one resulting from the SMDI MWT feature.

Datalink

The SMDI Datalink Feature provides the datalink interface between the message desk terminal equipment and the DMS-100. The DMS-100 Multilink ASCII Device Driver will be used as the interface and the datalink will be a

1200 baud, dedicated, full duplex line. As an interface, this feature will handle the following tasks:

- receive call information from feature Call Forwarding for SMDI
- route this call information to the appropriate message desk
- receive messages from the Message Desk concerning the activation of MWI
- interpret those message and send requests to activate MWI
- if negative acknowledgements are received, return these messages to the message desk

Call Forwarding

The Call Forwarding for SMDI feature utilizes the current functions of the call forwarding feature. The following lists call forwarding interactions with SMDI.

- In the event of call forward chaining to a message desk, the called station information presented to the message desk is the first call forward base station in the chain.
- A station with messages queued via the SMDI desk can retrieve the message by dialling either the call request retrieve code or the message desk DN directly. The former is preferred.

REFERENCE: DDOC AD0367
 DDOC AD0369
 DDOC AD0370

Package	NTX732AA02 SIMPLIFIED MESSAGE DESK INTERFACE(SMDI)
Feature set	SERVICES
Feature	SMDI CALL RETRIEVAL BILLING
Feature no	F2948

FEATURE SYNOPSIS

This feature is an enhancement of the call request feature in general and of the simplified message desk interface (SMDI) feature in particular.

The DMS-100 SMDR feature will generate as billing information, an AMAB150 report titled SMDR_CALL_DATA and eventually on SMDR tape record for every call attempt. The AMAB150 reports will be generated for call retrievals using the SMDI feature.

FEATURE DESCRIPTION

The SMDI call retrieval billing feature informs the user that a call request retrieve code has been activated to retrieve a call by generating an AMAB150 report and indicates the new feature code 10 in the field TERM FC.

NTX733AA02 Status: A+M ENHANCED SERVICE ORDER(UPG. BY NTX733AB

SERVICES	:	
ENHANCED SERVICE ORDER		F2885
CLEN FOR EBS		F2926

Package	NTX733AA02 ENHANCED SERVICE ORDER(UPG. BY NTX733AB)
Feature set	SERVICES
Feature	CLEN FOR EBS
Feature no	F2926

FEATURE SYNOPSIS

Currently, a lot of effort is required when an operating company wants to change the LEN of an electronic business set (EBS). The operator must manually delete all feature data associated with the old LEN and then add this data to the tables associated with the new LEN. The purpose of the change keyset LEN command (CKLN) is to automate this process. The CKLN service order command is used to change the LEN of an EBS set such as a member of the Meridian 2000 or 5000 series, or of a data unit. It is similar in function to the change LEN command (CLN) which is used to change the LEN of a POTS or an IBN line.

Included in this feature will be a new office parameter 'MAX_MADN_MEMBERS_PER_LSG', which will make the MADN engineering parameter for number of members per line subgroup, adjustable.

FEATURE DESCRIPTION

When the CKLN command is executed to change the LEN of a business set, all DN appearances and feature data associated with the old LEN, are automatically moved and associated with the new LEN. This move includes all feature data such as the speed calling list contents, from table IBNSC, and the call forwarding status from table CFX.

The CKLN command also fully supports both hunt group pilot and member DN appearances, from the four hunt group types, directory number hunting (DNH), distributed line hunting (DLH), multiline hunting (MLH), and bridged night number (BNN). As well MADN appearances with either single call arrangement (SCA) or multiple call arrangement (MCA) will be transferred to the new LEN.

The CKLN service order command will also support the ACD feature, and the SLU option. When the CKLN command is executed a check will be made to see if MADN bundling re-ordering is required due to the new LEN value. The CKLN command supports the following types of stations:

Proprietary business set - PSET, M5000 series
Meridian digital set - M2000 series, MAD0
Data unit - DATA, PDATA

Ref: BC0528

NTX733AB02 Status: A+M ENHANCED SERVICE ORDER(UPG. BY NTX733AC)

SERVICES	:	
ENHANCED SERVICE ORDER		F2885
ENHANCED SERVORD II		F2925
CLEN FOR EBS		F2926
CHANGE LINE CLASS CODES VIA SERVORD		G0039

Package	NTX733AB02 ENHANCED SERVICE ORDER(UPG. BY NTX733AC)
Feature set	SERVICES
Feature	ENHANCED SERVORD II
Feature no	F2925

FEATURE SYNOPSIS

This feature provides enhancements to the existing service order system. Enhancements are in the area of querying call forwarding, querying a RCF DN, changing the LCC of an EBS, changing the subgroup, zone and route, suspending and restoring a RCF DN, changing a MDN DN with the CDN command, changing primary status of a MDN member with the CMF command and changing a RCF DN and RCF data with the CDN command.

FEATURE DESCRIPTION

This feature provides the following:

- In the output of the QDN/QLEN/QDNWRK/QLENWRK command provide information indicating if CFU/CFI is activated and which DN it is forwarded to.
- Provide detailed RCF information in the output of the QDN command for a Remote Call Forwarded (RCF) DN.
- Provide the capability of changing the Line Class Code (LCC) of an Electronic Business Set (EBS) to the LCC of any other EBS set using the CHG command. The DSP command will also be able to display the LCC of any line.
- Provide the capability of changing the subgroup assigned to a line, trunk or VFG (virtual facility group) and the zone and route assigned to a customer group through use of the CHG command. The DSP command will also be able to display the subgroup, zone, and route.
- Provide the capability of suspending and restoring a RCF DN through the two existing commands: SUS and RES.
- Provide the capability of changing the primary or secondary status of a member of a multiple appearance directory number (MADN) group. This capability is to be provided through use of the CHF command.
- To allow the servord user to change a RCF DN as well as all the other RCF data which is normally entered with the NEWDN command. This capability is to be provided through use of the CDN command.
- To allow the servord user to change a MDN DN through use of the CDN command.

These service order commands are intended for use by customer data change (CDC) users or telco users. If the queried DN, LEN or customer group is not owned by the CDC user, use of the command is disallowed.

Package	NTX733AB02 ENHANCED SERVICE ORDER(UPG. BY NTX733AC)
Feature set	SERVICES
Feature	CLEN FOR EBS
Feature no	F2926

FEATURE SYNOPSIS

Currently, a lot of effort is required when an operating company wants to change the LEN of an electronic business set (EBS). The operator must manually delete all feature data associated with the old LEN and then add this data to the tables associated with the new LEN. The purpose of the change keyset LEN command (CKLN) is to automate this process. The CKLN service order command is used to change the LEN of an EBS set such as a member of the Meridian 2000 or 5000 series, or of a data unit. It is similar in function to the change LEN command (CLN) which is used to change the LEN of a POTS or an IBN line.

Included in this feature will be a new office parameter 'MAX_MADN_MEMBERS_PER_LSG', which will make the MADN engineering parameter for number of members per line subgroup, adjustable.

FEATURE DESCRIPTION

When the CKLN command is executed to change the LEN of a business set, all DN appearances and feature data associated with the old LEN, are automatically moved and associated with the new LEN. This move includes all feature data such as the speed calling list contents, from table IBNSC, and the call forwarding status from table CFX.

The CKLN command also fully supports both hunt group pilot and member DN appearances, from the four hunt group types, directory number hunting (DNH), distributed line hunting (DLH), multiline hunting (MLH), and bridged night number (BNN). As well MADN appearances with either single call arrangement (SCA) or multiple call arrangement (MCA) will be transferred to the new LEN.

The CKLN service order command will also support the ACD feature, and the SLU option. When the CKLN command is executed a check will be made to see if MADN bundling re-ordering is required due to the new LEN value. The CKLN command supports the following types of stations:

Proprietary business set - PSET, M5000 series
 Meridian digital set - M2000 series, MAD0
 Data unit - DATA, PDATA

Ref: BC0528

Package	NTX733AB02 ENHANCED SERVICE ORDER(UPG. BY NTX733AC)
Feature set	SERVICES
Feature	CHANGE LINE CLASS CODES VIA SERVORD
Feature no	G0039

FEATURE SYNOPSIS

This feature allows changing of Line Class Codes (LCC) within the set (1FR, 1MR, PBX, PBM, IBN, RES) via Service Order (SO) Systems.

FEATURE DESCRIPTION

This feature is an enhancement to the existing SO system. It provides the following additional capabilities:

- Allows the LCC's 1FR, 1MR, PBX, PBM, IBN and RES to be changed to any other of this set of same LCC's. This capability is provided through the Servord CHG command. In addition, the LCC of any line can be displayed through use of the Servord DSP command. Note: CHG and DSP are existing Servord commands.

These SO commands are intended for use by Customer Data Change (CDC) users or telco users.

Any time the LCC is to be changed, the existing option list for the line is checked to see which options are compatible with the new LCC (table LCCOPT is referenced in order to perform this check). All compatible options are to remain on the line. All incompatible options (with the exception of call forwarding, speed calling and call waiting) are to be deleted from the line. If any of the options are to be deleted, then the user will be informed of this in the form of a complete list of all the options to be deleted. The user can then go ahead with the change or block it.

In the case of the line having any of the call forwarding, speed calling or call waiting intragroup (CWI) options, then these options are deleted from the line and the line will be assigned the equivalent options corresponding to the new LCC using a fixed mapping procedure.

Ref: FDOC AL0740

NTX733AC01 Status: RTM ENHANCED SERVICE ORDER(UPG. OF NTX733AB

SERVICES	:	
ENHANCED SERVICE ORDER		F2885
ENHANCED SERVORD II		F2925
CLEN FOR EBS		F2926
CHANGE LINE CLASS CODES VIA SERVORD		G0039
GROUP NUMBER FEATURE CONTROL		G0040

Package	NTX733AC01 ENHANCED SERVICE ORDER(UPG. OF NTX733AB IN BCS26)
Feature set	SERVICES
Feature	ENHANCED SERVORD II
Feature no	F2925

FEATURE SYNOPSIS

This feature provides enhancements to the existing service order system. Enhancements are in the area of querying call forwarding, querying a RCF DN, changing the LCC of an EBS, changing the subgroup, zone and route, suspending and restoring a RCF DN, changing a MDN DN with the CDN command, changing primary status of a MDN member with the CMF command and changing a RCF DN and RCF data with the CDN command.

FEATURE DESCRIPTION

This feature provides the following:

- In the output of the QDN/QLEN/QDNWRK/QLENWRK command provide information indicating if CFU/CFI is activated and which DN it is forwarded to.
- Provide detailed RCF information in the output of the QDN command for a Remote Call Forwarded (RCF) DN.
- Provide the capability of changing the Line Class Code (LCC) of an Electronic Business Set (EBS) to the LCC of any other EBS set using the CHG command. The DSP command will also be able to display the LCC of any line.
- Provide the capability of changing the subgroup assigned to a line, trunk or VFG (virtual facility group) and the zone and route assigned to a customer group through use of the CHG command. The DSP command will also be able to display the subgroup, zone, and route.
- Provide the capability of suspending and restoring a RCF DN through the two existing commands: SUS and RES.
- Provide the capability of changing the primary or secondary status of a member of a multiple appearance directory number (MADN) group. This capability is to be provided through use of the CHF command.
- To allow the servord user to change a RCF DN as well as all the other RCF data which is normally entered with the NEWDN command. This capability is to be provided through use of the CDN command.
- To allow the servord user to change a MDN DN through use of the CDN command.

These service order commands are intended for use by customer data change (CDC) users or telco users. If the queried DN, LEN or customer group is not owned by the CDC user, use of the command is disallowed.

Package	NTX733AC01 ENHANCED SERVICE ORDER(UPG. OF NTX733AB IN BCS26)
Feature set	SERVICES
Feature	CLEN FOR EBS
Feature no	F2926

FEATURE SYNOPSIS

Currently, a lot of effort is required when an operating company wants to change the LEN of an electronic business set (EBS). The operator must manually delete all feature data associated with the old LEN and then add this data to the tables associated with the new LEN. The purpose of the change keyset LEN command (CKLN) is to automate this process. The CKLN service order command is used to change the LEN of an EBS set such as a member of the Meridian 2000 or 5000 series, or of a data unit. It is similar in function to the change LEN command (CLN) which is used to change the LEN of a POTS or an IBN line.

Included in this feature will be a new office parameter 'MAX_MADN_MEMBERS_PER_LSG', which will make the MADN engineering parameter for number of members per line subgroup, adjustable.

FEATURE DESCRIPTION

When the CKLN command is executed to change the LEN of a business set, all DN appearances and feature data associated with the old LEN, are automatically moved and associated with the new LEN. This move includes all feature data such as the speed calling list contents, from table IBNSC, and the call forwarding status from table CFX.

The CKLN command also fully supports both hunt group pilot and member DN appearances, from the four hunt group types, directory number hunting (DNH), distributed line hunting (DLH), multiline hunting (MLH), and bridged night number (BNN). As well MADN appearances with either single call arrangement (SCA) or multiple call arrangement (MCA) will be transferred to the new LEN.

The CKLN service order command will also support the ACD feature, and the SLU option. When the CKLN command is executed a check will be made to see if MADN bundling re-ordering is required due to the new LEN value. The CKLN command supports the following types of stations:

Proprietary business set - PSET, M5000 series
 Meridian digital set - M2000 series, MAD0
 Data unit - DATA, PDATA

Ref: BC0528

Package	NTX733AC01 ENHANCED SERVICE ORDER(UPG. OF NTX733AB IN BCS26)
Feature set	SERVICES
Feature	CHANGE LINE CLASS CODES VIA SERVORD
Feature no	G0039

FEATURE SYNOPSIS

This feature allows changing of Line Class Codes (LCC) within the set (1FR, 1MR, PBX, PBM, IBN, RES) via Service Order (SO) Systems.

FEATURE DESCRIPTION

This feature is an enhancement to the existing SO system. It provides the following additional capabilities:

- Allows the LCC's 1FR, 1MR, PBX, PBM, IBN and RES to be changed to any other of this set of same LCC's. This capability is provided through the Servord CHG command. In addition, the LCC of any line can be displayed through use of the Servord DSP command. Note: CHG and DSP are existing Servord commands.

These SO commands are intended for use by Customer Data Change (CDC) users or telco users.

Any time the LCC is to be changed, the existing option list for the line is checked to see which options are compatible with the new LCC (table LCCOPT is referenced in order to perform this check). All compatible options are to remain on the line. All incompatible options (with the exception of call forwarding, speed calling and call waiting) are to be deleted from the line. If any of the options are to be deleted, then the user will be informed of this in the form of a complete list of all the options to be deleted. The user can then go ahead with the change or block it.

In the case of the line having any of the call forwarding, speed calling or call waiting intragroup (CWI) options, then these options are deleted from the line and the line will be assigned the equivalent options corresponding to the new LCC using a fixed mapping procedure.

Ref: FDOC AL0740

Package	NTX733AC01 ENHANCED SERVICE ORDER(UPG. OF NTX733AB IN BCS26)
Feature set	SERVICES
Feature	GROUP NUMBER FEATURE CONTROL
Feature no	G0040

FEATURE SYNOPSIS

This feature allows the user to:

Assign a unique group number for each Call Pick Up group, Speed Calling group, and Hunt group when the group is established.

Access the group data for each group by the assigned group number to modify the group member data.

Query the group data by the assigned group number to verify the current group member information.

FEATURE DESCRIPTION

Group Number Assignment

When a new Call Pick Up group, Speed Calling group, or Hunt group is created, this feature allows the user to assign a unique group number to the group. The user is prompted to enter a group number. The range of a valid group number varies depending on the group type.

Modification of Group Member Data

This feature changes the commands to modify member data of Call Pick Up, Speed Calling, and Hunt groups. In particular, when adding a member to one of these groups, the user is prompted to enter the group number of an existing group. The group number is not required as input to delete a member from a group.

Query of Group Member Data

This feature modifies the capability to query group member data for Call Pick Up, Speed Calling, and Hunt groups. When doing so, the user is prompted to enter the group number of an existing group.

Ref: FDOC AL0741

NTX734AA01 Status: RTM EAO - IBN OIC USING SERVORD

EQUAL ACCESS END OFFICE(EAO) :
EAO - IBN PIC USING SERVORD

F2853

Package	NTX734AA01 EAE0 - IBN OIC USING SERVORD
Feature set	EQUAL ACCESS END OFFICE(EAE0)
Feature	EAE0 - IBN PIC USING SERVORD
Feature no	F2853

FEATURE SYNOPSIS

This feature provides the ability to specify a PIC for an IBN station using service order. This new IBNPIC will override any other line or group PIC present in IBN translations. This feature also provides the ability to deny toll access to selected carriers by using CTD SERVORD option.

FEATURE DESCRIPTION

IBN PIC

The new IBN PIC is assigned to an IBN station (data unit, EBS or standard IBN 500/2500 set but not attendant console) via SERVORD using the Add Option (ADO) command, and removed using the Delete Option (DEO) command (i.e., in the same way as to a POTS line).

Existing Network Class of Service PIC (NPIC) and Group PIC (GPIC) remain in IBN translations and are used to PIC lines which are not assigned a PIC using SERVORD. Translations for such stations are not affected in any way by this feature except for calls routed through VFGs. However, if an IBN station is assigned a PIC using SERVORD, this new PIC overrides any other NPIC or GPIC present in IBN translations.

Equal Access Toll Denial

Another new SERVORD option provided to IBN stations by this feature is the Carrier Toll Denied (CTD) option. The purpose of the CTD option is to deny toll access from a given IBN station to up to three selected carriers. The CTD option is put on an IBN station by using SERVORD ADO command and removed by using DEO command.

It is not possible to assign the CTD option to attendant console using SERVORD.

Virtual Facility Groups

Translation for calls through VFGs is done in two separate stages:

1. From the IBN station to the trunk (incoming) side of the VFG, and
2. From the line (outgoing) side of the VFG to the end office.

Prior to this feature the IBN PIC or dialled 10XXX digits were discarded before the second stage of translation (unless save prefix prefix digits option was present in IBN translations). Instead, the VFG carrier specified as part of the EA option in VFG table VIRTGRPS was used.

By adding a new option IBNPIC to table VIRTGRPS, this feature makes it possible to choose on a per VFG basis which carrier to use in the second phase of translation as follows:

1. If IBNPIC is present, the IBNPIC or dialled 10XXX digits override the VFGPIC.
2. If IBNPIC is not present in table VIRTGRPS, the VFGPIC is used in the second stage of translation.

Ref:

FGX 186AA Equal Access End Office
NTP 297-2101-310 Service Order and Query System
NTP 297-2001-451 Customer Data Schema
AL0051 FDOC
FSD 20-24-0000 IC/INC Interconnection

NTX735AA01 Status: RTM FLEXIBLE ANI

SWITCHING AND TRANSLATION :
FLEXIBLE ANI INFORMATION DIGIT ASSIGNMENT F2713

Package	NTX735AA01 FLEXIBLE ANI
Feature set	SWITCHING AND TRANSLATION
Feature	FLEXIBLE ANI INFORMATION DIGIT ASSIGNMENT
Feature no	F2713

FEATURE SYNOPSIS

This feature provides Telco's with flexibility to assign their ANI information digits (two digit codes) to an originating station).

FEATURE DESCRIPTION

This feature provides the capability to indicate to an InterLATA carrier (IC) or an Operator Service System (OSS) the particular feature associated with an originating line. This is accomplished by assigning, using the service order routine, an ANI information digit pair to the originating station and transmitting it to the IC or OSS as part of the ANI sequence. Flexible ANI applies to outgoing Equal Access calls, corridor calls and calls with OSS signaling.

Flexible ANI (FANI) is now one of the options that can be added to a line.

The digit pairs are stored in the new field FANIDIGS in the LINEATTR table and associated with line class codes. IBN lines are excluded.

Telcos have the capability to specify the IC or OSS to which FANI digits can be transmitted. An IC can still receive ANI without receiving FANI.

Ref: BR0713 FDOC

Package	NTX737AA01 FLEXIBLE BELLCORE AMA(UPG.BY NTX737AB)
Feature set	ADMINISTRATION
Feature	FLEXIBLE BC AMA CALL CODES
Feature no	F2896

FEATURE SYNOPSIS

This feature gives telco the ability to generate a restricted set of Bellcore AMA call codes on a per translation basis. Call codes covered are 088 and 800 to 805.

FEATURE DESCRIPTION

The current fixed translation scheme in DMS does not allow Telco's to assign their own call codes for new services not yet defined in LSSGR. This feature allows Telcos to assign by datafilling the following call codes:

088 - Non DA 55 call (i.e., other than 555-1212)
800 to 805 - Generic records not currently defined.

The following structure codes are supported for call code 088:

00001 - Answered
00002 - Unanswered
00101 - Long duration

Telco assigns call codes by datafilling the subtable MAPRT. This feature applies to both POTS and IBN lines and supports the following trunk groups: SC, OC, ATC, P2, PX, IBNT1, IBNT2.

Ref: FDOC AF0167
LSSGR Section 8.1

NTX737AB01 Status: RTM FLEXIBLE BELLCORE AMA (UPG. OF NTX737AA)

ADMINISTRATION	:	
FLEXIBLE BC AMA CALL CODES		F2896
FLEXIBLE AMA EXPANSION		F6519

Package	NTX737AB01 FLEXIBLE BELLCORE AMA (UPG. OF NTX737AA)
Feature set	ADMINISTRATION
Feature	FLEXIBLE BC AMA CALL CODES
Feature no	F2896

FEATURE SYNOPSIS

This feature gives telco the ability to generate a restricted set of Bellcore AMA call codes on a per translation basis. Call codes covered are 088 and 800 to 805.

FEATURE DESCRIPTION

The current fixed translation scheme in DMS does not allow Telco's to assign their own call codes for new services not yet defined in LSSGR. This feature allows Telcos to assign by datafilling the following call codes:

088 - Non DA 55 call (i.e., other than 555-1212)
800 to 805 - Generic records not currently defined.

The following structure codes are supported for call code 088:

00001 - Answered
00002 - Unanswered
00101 - Long duration

Telco assigns call codes by datafilling the subtable MAPRT. This feature applies to both POTS and IBN lines and supports the following trunk groups: SC, OC, ATC, P2, PX, IBNT1, IBNT2.

Ref: FDOC AF0167
LSSGR Section 8.1

Package	NTX737AB01 FLEXIBLE BELLCORE AMA (UPG. OF NTX737AA)
Feature set	ADMINISTRATION
Feature	FLEXIBLE AMA EXPANSION
Feature no	F6519

FEATURE SYNOPSIS

This feature expands flexible AMA capability to allow generation of Bellcore AMA call codes 806-999, and changes the hierarchy of call code generation so that generic call codes 800-999 can be produced in place of any Bellcore non-TOPS AMA call code.

Flexible AMA also supports the ability to set the service feature field value to 800-999 for any Bellcore non-TOPS AMA call code generated by DMS-100F.

FEATURE DESCRIPTION

Prior to this feature the generic call code range available to Telco was 800-805. This feature expands the range to 800-999. Telco can assign these call codes by properly data filling AMAPRT subtable.

Prior to this feature generic call codes 800-805 could only override call codes 006 and 067. This feature allows generic call codes 800-999 to override any Bellcore non-TOPS call code.

Newly supported by this feature are also the service feature field values 800-999. These can be set by Telco by datafilling AMAPRT subtable.

Ref:

FDOC AF0747

FGX737 General Feature Description - Flexible Bellcore AMA

NTP 297-1001-128 Bellcore AMA

Package	NTX738AA03 SWITCH PERFORMANCE MONITORING SYSTEM
Feature set	ADMINISTRATION
Feature	SPMS - CUSTOMER CONFIGURATION
Feature no	F6310

FEATURE SYNOPSIS

This feature is largely a study feature to identify the requirements, high-level design and development strategy of a network-based switch performance monitoring system (SPMS). It also has the ability to request SPMS results via the MAP by a display sub-command; introduces calendar month reporting capability and alters the system of scaling performance indices to range from 0 to 100.

FEATURE DESCRIPTION

The SPMS is an optional feature available on the DMS-100 and SL-100 families of digital multiplex switches. At present, the results from SPMS are produced independently on each node of a customers network. The purpose of the study feature is to establish the relevant criteria for accumulating these individual results into an overall SPMS index for the entire network.

The central reporting point in the customer network will be a Dynamic Network Controller (DNC) which will receive transfers from the participating DMS and SL-100 switches on a half-hourly basis. Certain SPMS data which changes relatively infrequently will be sent on a daily basis.

The DNC will be provided with full graphic display facilities to view the SPMS results together with the capability for windowing/tele-scoping to examine data in greater detail. The SPMS display will be supported by on-line documentation to assist in the identification and resolution of troubles as indicated by SPMS index patterns.

This feature will also introduce the system of switch index plans similar to those presently used by Telcos on a manual basis to track the quality of maintenance and provisioning effort over time and across sites. The SPMS indices will range from 0 to 100.

Both individual day and report month indices will be made available on demand at the MAP level.

Package	NTX738AA03 SWITCH PERFORMANCE MONITORING SYSTEM
Feature set	ADMINISTRATION
Feature	SPMS ENHANCEMENT
Feature no	F6443

FEATURE SYNOPSIS

This feature provides minor improvements for the switch performance monitoring system (SPMS). These improvements include the addition of indices to the index tree to capture attendant console performance. This involves the addition of two new fields to the ACSYSTR OM group to collect the correct OM counts.

A new SPMS subcommand joins the SET, DISPLAY and QUIT subcommands of the SPMS CI. This command takes the form of DESCRIBE followed by a list of SPMS index names. A brief description of each index in the list is output.

FEATURE DESCRIPTION

The SPMS index tree structure will be expanded to include error and fault indices for attendant consoles. These will be added to the MTCEPERF section of the SPMS index hierarchy.

ATTCNERR is a new basic SPMS index. It will be calculated from measurements derived from the ACDMFL (AC errors due to various DM related reasons), the ACCF3PFL (AC errors due to various CF3P reasons) and the ACERR (AC errors not counted in the other two fields) fields of the ACSYSTR OM group. It will measure the percall error rate of attendant consoles.

ATTCNFLT is a new basic SPMS index. It will be calculated from measurements derived from the ACFLT (AC problems which bring the console down) field of the ACSYSTR OM group. It will measure unit failure rate of attendant consoles.

ATTCONPF is a new aggregate SPMS index calculated as the weighted average of the ATTCNERR and the ATTCNFLT indices. It will be a summary of attendant console performance on a switch.

New Fields in OM Group ACSYSTR:

Two new OMs are needed to generate the new SPMS indices. There will be two fields added to the ACSYSTR OM group. There is one ACSYSTR OM group per switch. It measures shortages and faults of such system resources as Digital Modems (DMs), Three Port Conference Circuits (CF3Ps) and PORTPERMEXT Extension Blocks, encountered during RTSing the attendant console (AC).

An ACERR field will be added to this group to measure miscellaneous attendant console errors which at present are collected in ten of the fields in the ACTRBL OM group.

An ACFLT field will be added to this group to measure miscellaneous attendant console faults which at present are collected in eleven of the fields in the ACTAKEDN OM group.

SPMS Describe:

This feature adds a new subcommand to the CI command "SPMS" at the MAP. This subcommand provides simple explanations of the specified SPMS indices. When the DESCRIBE command is used within the SPMS CI increment with a valid SPMS index name, the user will see the name of the index, followed by the type of index (basic, aggregate or composite) and a brief description of the index. In the case of a basic index, this description will include the OMs which are used to generate the index.

Within the SPMS CI increment, the format is:

DESCRIBE (list of SPMS index names)

Ref: FDOC AG0469

NTX750AB04 Status: LTD ISDN BASIC ACCESS(UPG. OF NTX750AA)

SERVICES	:	
ISDN IAC SWACT FOR TRANSPORT SERVICES		F6113
MAINTENANCE	:	
ISDN D CHANNEL HANDLER ROBUSTNESS		F6114
ADMINISTRATION	:	
IDENTIFICATION OF ISDN ISLC-1B IN DMS ARCHITECTURE		F6128
ISDN LINE MAINTENANCE		F6129
MAINTENANCE	:	
BEARER CAPABILITY FOR ISDN		F6144
CALL PROCESS	:	
ISDN CALL PROCESS INDICATION		F6145
SERVICE	:	
SERVICE ORDERS FOR FOR ISDN TERMINALS		F6146
CALL PROCESS	:	
ISDN MULTIPLE TERMINALS CALL PROCESSING		F6147
TEST	:	
ISDN TERMINAL TEST AND CONFIGURATION		F6148
MAINTENANCE	:	
CC SOFTWARE FOR XPM SPECIAL CONNECTIONS		F6149
MULTIPLE TERMINALS FOR ISDN LOOP		F6150
ENHANCEMENT	:	
ISLM ENHANCEMENT		F6360
MAINTENANCE	:	
ISDN ST MAINTENANCE		F6370
NEW LTP LEVEL FOR DATA LINES		F6373
CALL PROCESSING	:	
IAC WARM SWACT FOR ISDN CALL PROCESING		F6381
CAPACITY	:	
INCREASE MAXIMUM NUMBER FOR ISDN TERMINAL PROFILES		F6385
TABLE CONTROL	:	
TABLE CONTROL FOR ISDN BRA FUNCTIONAL SIGNALLING		F6389
MAINTENANCE	:	
BERT FOR ISDN BASIC ACCESS LOOPS		F6532
ISDN LCM CC MAINTENANCE III		F6570
SERVICES	:	
SERVICE PARAMETERS		F6572
MAINTENANCE	:	
ISDN BRA OPTICAL LINE CARD MTCE		F6629
CALL PROCESSING	:	
ISDN LCM CALL PROCESSING		F6632
ENHANCEMENT	:	
DCH ENHANCEMENTS FOR ISDN FUNCTIONAL SIGNALLING		F6647
MAINTENANCE	:	
LOOP MAINTENANCE FOR ISDN LINE CARD NTB25AB		F6648
ISDN LCM LINE MAINTENANCE SUPPORT		F6649
DOCUMENTATION	:	
ISDN LCM SOFTWARE		F6650
DIAGNOSTICS	:	
ISDN LCM BASE DEVELOPMENT		F6651

CALL PROCESSING	:	
XPM ISDN CALL CAPACITY EXPANSION		F6904
ISDN LCM CALL PROCESSING II		F6969
ENHANCEMENT	:	
ISDN LCM C-CHANNEL INTERFACE ENHANCEMENTS		F6970
TRANSPORT	:	
LCMI PROCESSOR UPGRADE SUPPORT		F7168
ADMINISTRATION	:	
ISDN LTC ISP LOADER		F7293
DIAGNOSTICS	:	
ISP DIAGNOSTICS		F7294
MAINTENANCE	:	
ISDN LTC PM MAINTENANCE I		F7296
ISDN LTC/ISP COMMUNICATIONS		F7298
ADMINISTRATION	:	
ISDN DCH DEVICE INTERFACE		F7299
CALL PROCESSING	:	
ISDN LTC DCH SWACT SUPPORT		F7300
LTCI WARM SWACT		F7304
ISDN LTC LOOP EXPANSION		F7307
MAINTENANCE	:	
ISDN LTC - ISP AND DCH PERFORMANCE MONITORING		F7353

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	SERVICES
Feature	ISDN IAC SWACT FOR TRANSPORT SERVICES
Feature no	F6113

FEATURE SYNOPSIS

This feature provides an inter unit switching capability (SWACT) of the integrated services digital network (ISDN) transport services in the ISDN access controller (IAC).

FEATURE DESCRIPTION

This feature provides a warm SWACT capability by switching the activity from the active unit of the IAC to the inactive unit without disturbing established calls. The active unit handles all of the call processing and hardware control responsibility while the inactive unit is in a standby mode.

Three main causes of a warm SWACT are unrecoverable software defects, hardware faults in duplicated hardware components of the IAC, and on command from the central contro.

The main principle of handling a warm SWACT is to continuously synchronize data between the two units of the IAC in order that when a SWACT occurs, the inactive unit can continue serving established calls. Besides handling static data which are downloaded from the central control, this SWACT software must also transfer call-affected dynamic information from the active unit to the inactive unit. This feature provides warm SWACT for the transport services - logical link management, statistical multiplexer and Bd-channel manager. SWACT for ISDN call processing is handled by a separate feature.

Ref: BC2096

BC2097 ISDN LOGICAL LINK MANAGEMENT

BC2094 ISDN IAC STATISTICAL MULTIPLEXER FOR PACKET HANDLER

BC2098 ISDN D-CHANNEL CC MAINTENANCE

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN D CHANNEL HANDLER ROBUSTNESS
Feature no	F6114

FEATURE SYNOPSIS

This feature enhances the robust of the D-channel handler (DCH) in the link access procedure for the D-channel (LAPD). With this enhancement, the DCH will remain operational when it receives improper terminal inputs at the link layer level. Additionally, the effect of improperly behaved terminals on other terminals will be limited.

FEATURE DESCRIPTION

The D-channel handler (DCH) is a DMS peripheral equipment component which terminates the D-channel of a subscriber's integrated service digital network (ISDN) line. The DCH communicates with the ISDN access controller (IAC) through two separate queues in opposite directions within shared memory.

A terminal is in a link layer state called babbling when it is transmitting a large number of frames to the DCH within a time period that is less than the normal LAPD timer value. The ISDN access controller, while scanning all the DCHs it controls, may be sent more messages than it can handle because of a babbling TE. When the DCH-to-IAC message queue begins to fill up, the operation of other logical links will be affected. Finally, when the DCH-to-IAC queue can hold only one more message, the DCH uses this message slot to send a SWERR message to the central control (CC). The CC will respond by resetting the DCH, thereby taking down all of the logical links.

This feature provides the capability to guard against babbling terminals filling up the DCH-to-IAC queue while allowing the other terminals to continue normal operation.

Exception states are defined as states in which a terminal cannot acknowledge information frames from the DCH. This will result in the frame, to be delivered to the terminal, being held up in the DCH. In this case, layer 3 frames from the IAC may be lost when they are held up in the DCHs transmit queue for a period longer than allowed. As a result, software error messages will be generated by the DCH and sent to the CC.

This feature provides the capability to prevent the DCH from generating SWERR messages due to terminal in exception states.

Ref: BF0943

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	ADMINISTRATION
Feature	IDENTIFICATION OF ISDN ISLC-1B IN DMS ARCHITECTURE
Feature no	F6128

FEATURE SYNOPSIS

This feature allows the user to identify the phase 1B linecard (ISLC-1B) in the DMS ISDN environment by datafilling it in table LNINV as card code BX25AA. This will then provide maintenance capability for the ISLC-1B by means of the LTP MAP level commands.

FEATURE DESCRIPTION

This feature provides the ISLC-1A maintenance capability for the ISLC-1B linecard, although no new maintenance capability is added.

Identification of the 1B line card to the DMS system involves datafilling BX25AA as a valid ISDN line card code in table LNINV and datafilling BX60AA as a valid ISDN LCM equipment code in table ISLMIN. This will then provide identification at the LTP level of the MAP for diagnostic and maintenance activities for the ISLC-1B line card.

This feature is required for implementing a number of loop and line maintenance features. See reference document for list of related features.

Ref: AL0382

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	BEARER CAPABILITY FOR ISDN
Feature no	F6144

FEATURE SYNOPSIS

Bearer capability defines a type of service accessible by a user which provides a call the ability to select terminals based on their call handling characteristics. Bearer capability (BC) allows multiple terminals to be assigned and identified by the same directory number regardless of whether those terminals support voice, data or both. BC allows a non-ISDN voice terminal to communicate with an ISDN voice terminal but not with an ISDN data terminal.

Transport of BC information is provided within call processing.

FEATURE DESCRIPTION

In a non-ISDN environment voice and data terminals are identified by different directory numbers. With BC, one directory number can be associated with multiple terminals and the facility being called or accessed can be automatically identified.

A call appearance (CAP) is the equivalent of a DN key on an Electronic Business Set (EBS). Through the use of bearer capability call screening provided by the network, call appearances are alerted only if incoming and terminating BCs are compatible. If the BC of the terminator is incompatible with the BC of the call, the call is not completed and the terminator is not alerted to the incoming call. Note this call screening is optional.

This call screening feature is required only for calls involving stimulus terminals and this includes interworking. Functional terminals do not require this feature since they have the capability to screen incoming calls based on the information sent to them via the network.

Only terminals with stimulus signalling will be supported during initial releases of ISDN. To provide call screening for these terminals using the bearer capability of both the incoming call and the terminator, the network must supply the intelligence.

This feature provides call screening between stations in both the IBN and ISDN based on bearer capability and low layer compatibility. This includes members of MADN groups, and hunt groups. In release 1, the call screening is accomplished in a single stage using bearer capability and limited low layer compatibility (LLC) to determine whether termination is possible. The term 'BC³' is used to describe the combination of BC and LLC since they are handled together. Such a feature makes it possible for

ISDN terminals to have multiple call appearances with the same directory number (MADN) but having different BC's.

Call screening provided by this feature is intended to enhance the use of ISDN terminals by preventing a user from terminating on parties for which it is not intended e.g., voice call to a data terminal. Call screening may be modified by the operating company and the user.

In summary, this feature:

- a) Provides predefined bearer capabilities.
- b) Allows the operating company to assign and modify BC data.
- c) Screens calls based on BC.

Ref: AC0094DD

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESS
Feature	ISDN CALL PROCESS INDICATION
Feature no	F6145

FEATURE SYNOPSIS

Two features describe the progression of an ISDN call and its associated indication. These are call progress indication and calling line identification for ISDN. Call progress indication allows an ISDN terminal to receive information about the progress of a call. Calling line identification provides four address information elements of the Q.931 protocol from the network to the terminal.

FEATURE DESCRIPTION

Call progress indication provides info between the CC and the IAC which in turn relays progress information elements such as progress indicator, signal and cause from the IAC to the terminal. The transfer of call progress information from the network to the terminal is known as CPI. Information regarding alerting, answering of the called party and routing to treatments, tones and announcements are examples of call progress information. Traditionally, the network provides the terminal with in-baud busy and reorder tones as indications to a user that a call was not successful. With ISDN, terminal vendors can use the call progress knowledge from the network to display a message instead of relaying order tone.

The progress indicator information element describes events occurring during the life of a call. Some progress indicator values are: call not end to end ISDN call proceeding, dialing, call alerting at destination. The two categories of progress indicator (PI) values are call type PI and call progress PI.

The signal information element informs a terminal to generate alerting signals and call progress indicators. A signal value can be either a 'tone' value or an 'alerting' value. The tone signal which applies to outgoing calls indicates that the 'D' channel message containing the signal value is accompanied by an in-baud tone over the B-channel.

This allows the terminal to perform the following options:

- Connect to the B channel and listen to network provided tone
- Apply local tone
- Supply alternate method (instead of tone) to inform user (e.g., display a message).

The alerting signal which applies to incoming calls, indicates that the signal value is transmitted over the D channel and that there is no accompanying B channel signal. The terminal must apply the alerting signal locally; tone, message etc.

The cause information element describes the reason for generating certain messages. This element will be sent wherever the progress indicator value 'treatment applied to call' is put so the terminal can display to the user, the reason the call was routed to treatment.

The calling line identification feature provides four address information elements of the layer 3 protocol for ISDN access (Q.931) from the network to the terminal. These information elements are (CAD) Connected Address Display, (OAD) Origination Address Display, (DAD) Destination Address Display and (RAD) Redirecting Address Display. This feature defines when the network will send each of these elements and the content of each. The terminal vendor decides how this information is to be used.

The Q.931 stimulus signalling protocol for initial ISDN release(s) is intended to support simple terminals. Information provided with the calling line identification feature will allow more sophisticated terminals to use displays or registers.

Ref: AC0096DD

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	SERVICE
Feature	SERVICE ORDERS FOR FOR ISDN TERMINALS
Feature no	F6146

FEATURE SYNOPSIS

Service orders provide an operating company with a set of commands for database changes. These commands can determine the status, working or unassigned of DNs and LENS associated with lines. This feature provides the capabilities of the DMS-100 service orders and query system to support ISDN stimulus terminals.

ISDN is required to support multiple terminals, per LEN and each terminal may have multiple directory numbers (DNs) and features. The operating company user defines the logical terminals using standard DMS-100 service order procedures.

FEATURE DESCRIPTION In IBN, it was sufficient to use the LEN and the key number for the EBS to identify the directory number or the feature with 1 terminal per loop.

A logical terminal is associated with a LEN and a terminal endpoint identifier (TEI) on that interface. A physical terminal connected to the ISDN loop with that TEI can then originate and receive calls.

Each logical terminal is given a unique identifier when it is used in service orders. The logical terminal identifier (LTID) consists of two parts. These are:

LTGRP (Logical Terminal GRoup). The name of a group of logical terminals. For ISDN terminals it is "ISDN".

LTNUM (Logical Terminal NUMBER). A number between 1 and 1022 which identifies a logical terminal within a group.

A logical terminal can have one of the four kinds of service: circuit switched, D-channel packet switched, B-channel packet switched and combined circuit switched and D channel packet switched. To avoid B channel congestion, the number of circuit switched logical terminals is limited to 2 per interface in ISDN release 1. All other logical terminals may only have D-channel packet switched services.

A logical terminal supports a maximum of 64 programmable activators (keys) which can be used as call activators or feature activators. When an activator is used as a line or a DN it is known as a call appearance or CAP when used as a feature "key" it is known as a feature appearance or FAP.

A minimum of 2 activators can be defined and there must be at least one CAP per terminal assigned to activator number 1 and one FAP assigned to release call function.

This feature provides the following capabilities:

a) For circuit switching and/or packet switching logical terminals (LT)

- define, delete or query a LT
- attach or detach an LT and a TEI to/from
- query the ISDN loop

b) For circuit switching logical terminals

- define call appearances on the LT
- add and delete feature activators on the LT
- query a directory number.

Ref: AC0098DD

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESS
Feature	ISDN MULTIPLE TERMINALS CALL PROCESSING
Feature no	F6147

FEATURE SYNOPSIS

This feature along with "Multiple Terminals for ISDN Loop" will fold back all the capabilities that allow multiple terminals on a single ISDN loop including table control and call processing hooks, into the normal BCS stream.

FEATURE DESCRIPTION

The purpose of this feature is to enhance DMS-100 call processing for support of ISDN calls using diverse terminal configurations. This feature categorizes and explains and provides mechanisms to define these various configurations.

VID's or virtual terminal identifications were originally introduced to handle the extra keys that a p-phone could have.

Previously, there were common VID mapping procedures that were used regardless of whether it was the loop or set data that was going to be accessed.

The call processing fold back of feature "Multiple Terminals for ISDN Loop" comprises mainly of checking all instances of VID mapping and converting to the appropriate new VID mapping procedure.

These new VID mapping procedures are replacing both the original VID mapping procedures and procedures introduced in an earlier ISDN feature release. These procedures are new in name only and are intended to clearly indicate what the procedure is being used for.

Ref: AC0139

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	TEST
Feature	ISDN TERMINAL TEST AND CONFIGURATION
Feature no	F6148

FEATURE SYNOPSIS

The station ringer feature for ISDN terminals called terminal test and configuration (TTC) is provided as a facility maintenance feature. The initial ISDN release is supported by existing "keyset call processing" in the XPM leaving the call/feature processing core largely unaffected.

FEATURE DESCRIPTION

The Electronic Business Set (EBS) Station Ringer Test (SRT) provides a functional test of the lamps and keys of the terminal. This feature has evolved from the SRT and provides basic ISDN Q.931 layer three communication verification to the abstract terminal and with data filled feature information in the network.

A physical terminal, and there can be up to 8 such terminals connected to an interface, can have one or more mappings onto an abstract terminal. There is a one to one mapping between an abstract terminal and a logical terminal. Logical terminal with their access privileges (circuit, packet switching or both) allow an operating company to data-fill and map onto physical terminals as required.

The TTC provides a logical test for the keypad, feature indicators and any datafilled feature activators associated with the abstract terminal. TTC sends messages to the abstract terminal which assist the terminal installer or the terminal itself in determining what feature appearance or call appearance is assigned to each feature activator (FA) and feature indicator (FI) pairs.

Ref: AC0092

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	CC SOFTWARE FOR XPM SPECIAL CONNECTIONS
Feature no	F6149

FEATURE SYNOPSIS

CC software for XPM special connections provides the central control software support for a variety of special connections required for ISDN applications in the XPM based ISDN access controller (IAC) and LCM based integrated services line module (SLM).

This feature provides the general special connection framework for special connections in XPM and LCM based peripherals and specific support for the ISDN connections, within the general framework.

FEATURE DESCRIPTION

Special connections in the DMS are connections that do not relate to call processing, although they use the same switch resources, are permanent ie, nailed-up, is maintained continuously and carries both voice and signaling information through the peripheral without going through the network.

This feature provides the CC software for XPM special connections within XPM and LCM based peripherals. It implements a new table SPECCON for special connections and adds ISDN specific support. The feature also provides several utilities to query the special connections which are used in ISDN ST, basic line and loop diagnostics and maintenance software features. The feature provides the capability to update or modify the special connections while the XPM is in-service.

Special connections required for ISDN applications involve channels on an ISDN line card on an ISLM, channels on the DS1 on an IAC and an ST on an IAC. The connections supported are:

1. D-channel connections from the ISDN line card to the DCH.
(via ISLM and IAC).
2. Bd-channel connections from the PHI to the PH (via IAC).
3. Bb-channel connections from the ISDN line card to the PH (via ISLM and IAC).
4. B-channel connections from the ISDN line card to another ISDN line card on the same ISLM (via ISLM and IAC).

Ref: AC0095 FDOC CC SOFTWARE FOR XPM SPECIAL CONNECTIONS

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	MULTIPLE TERMINALS FOR ISDN LOOP
Feature no	F6150

FEATURE SYNOPSIS

ISDN basic access interface terminates on a single line card and has one line equipment number (LEN) associated with it. Each interface, per Q.921 recommendation is to support up to 8 terminals. To uniquely identify the terminals on the interface each LEN is associated with a number of parameters. This feature provides a mechanism to support multiple terminals on a single interface.

FEATURE DESCRIPTION

A basic access interface has capacity to support simultaneously 2 circuit switched calls over the B channels and many packet switched calls over the D channel. The D channel is used for call control signalling for the B channel.

The parameters associated with a line equipment number include:

- 1) TEI, Terminal Endpoint Identifier, which locates each terminal on a loop by assigning it a number.
- 2) TEI's on the same loop are given the same address referred to as line equipment number (LEN).
- 3) Each LEN supports a maximum of 8 TEI's and accordingly, 8 physical terminals.

The LEN and TEI pair informs the node where the terminal is located.

- 4) The LTID, logical terminal identifier, is a profile of the features, administrative requirements, access privileges and services assigned to a specific terminal on the loop. The LTID informs the node of the terminal's specific attributes. The LTID is mapped to the TEI and LEN, allowing portability of a terminal's features and services. Depending on the LTID profile, a terminal can access both circuit switching as well as b and D channel packet switching.
- 5) DN, directory number, is the telephone number dialed to access the terminal.

A user defines a logical terminal with datafill and once defined, is associated with an interface (LEN) and a TEI on that interface. Once this association is complete, a physical terminal on the loop with that TEI can originate and receive calls.

This feature provides 2 capabilities. At access termination it provides mechanisms to define logical terminals their access privileges (cct, or packet or both) and to map these logical terminals onto ISDN interfaces and TEI's. At circuit switching it allows datafilling the attributes of circuit switching terminals.

Ref: AC0097FN

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	ENHANCEMENT
Feature	ISLM ENHANCEMENT
Feature no	F6360

FEATURE SYNOPSIS

In an ISDN basic rate loop with the associated line card and NT1, this feature provides the following diagnostic ability. It speeds up the report of loss of sanity of an ISDN line card to the CC. It also allows the recovery from X-channel backup condition during which a line module is liable to communicate with the Network Termination (NT1).

FEATURE DESCRIPTION

Sanity loss occurs when there is a change in synchronization state of the U interface in an ISDN line card (ISLC) over 2 samples. The ISLM line module processor scans for this change every 9 seconds using C-channel messages. The C channel is a 8 kbps channel dedicated for maintenance between the network and NT1. When sanity loss is reported to the CC with a delay of between 4 and 8 seconds from the current range of 9 to 18 seconds and a 12 to 16 second time delay for sanity gain report 18 seconds and a 12 to 16 second time delay for sanity gain report.

The X channel protocol is used for local communication between 2 ends of the inter-chip digital link such as between the L and U chips in the ISLC or between the T and U chips in the NT1. If the X channel is locked up, the ISLM cannot communicate with the U chip in the NT1 X-channel lockup usually occurs after the CO relay has been operated due to maintenance requests from the integrated access controller (IAC) and CC. Lock up can also occur after rframe synchronization has been lost in the U interface in the NT1.

This feature will provide recovery procedures from lockout by sending a broadcast C channel message followed by a dummy message to the T chip in the NT1.

Ref: AC0093

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN ST MAINTENANCE
Feature no	F6370

FEATURE SYNOPSIS

This feature provides the basic maintenance for the Integrated Services Line Module (ISLM), the ISDN Access Controller (IAC) and the ISDN Signalling Terminal (STE) frame, which, along with the ST shelves on the IAE frame, perform 'D' channel functions.

FEATURE DESCRIPTION

The ISLM is a simplex line module (no takeover) which connects to the IAC by 2 DS 30A links capable of supporting 19 ISDN lines (no p-phones or data units). This feature implements the office data modifications (ODMs) and provides PM display of the MAP.

An IAE frame is a hybrid of the line trunk controller (LTC) and a message switching buffer (MSB). The IAC is a 2 unit modified LTC capable of supporting signalling terminals (STs) and only the ISLM. There are 16 C-side DS 30 links and 20 p-side ports for DS-30A or DS-1 links. There are 2 types of STs; the D channel handler (DCH) and the packet handler interface (PHI). The DCH codes/decodes and routes the D channel information. Signalling information is sent through the messaging link to the network while packet data is routed to the PHI. The PHI reroutes the packet data from the D channel through a DS-1 (B8ZS) to a packet handler. This feature provides maintenance support including office data modification (ODM) and limited manual maintenance support at the MAP.

Additional STs on a separate ST7E extension frame are supported by the IAC for a total of 80 STs. The Bd channel is the interface between the IAC and the packet handler dedicated to carrying D channel packet data. This feature implements the basic maintenance support for commissioning of the Bd channel and provide the OM information collected by the ST's.

Ref: AC0093, AL0164, AL0165

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	NEW LTP LEVEL FOR DATA LINES
Feature no	F6373

FEATURE SYNOPSIS

This feature provides software for the new "LEVEL" command at the LTP level of the MAP to facilitate the accessing of the various LTP sub-levels. A new LTP sub-level called LTPDATA has been added for testing DATA and ISDN lines.

FEATURE DESCRIPTION

The objectives of this feature are:

- to allow LTP sub-levels to be accessed by one "LEVEL" command with a parameter to specify which sub-level the user wants to enter.
- to create a new command sub-level for testing and maintaining DATA and ISDN lines
- to re-structure the existing commands into various directories of related commands.

The new "LEVEL" command at the LTP MAP level will enable users to access LTP sub-levels by specifying the sub-level name as the parameter, for example "LEVEL (sub-level)". The parameter range will correspond to the available sub-levels loaded on the switch and includes LTPMAN, LTPLTA, IBNCON, CSPDS and the new LTPDATA.

With the evolution of datapath and the introduction of ISDN, a new sub-level that consists of commands designed solely for DATA and ISDN lines is required. This sub-level will provide users with specialized commands to carry out test and maintenance work on DATA and ISDN loops only.

The present command sub-levels which have been re-structured are LTPMAN, which becomes a level for command operation that requires network connections and LTPLTA, which remain as a level for commands which requires line test access.

Ref: AL0166

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESSING
Feature	IAC WARM SWACT FOR ISDN CALL PROCESING
Feature no	F6381

FEATURE SYNOPSIS

This feature provides an inter-unit switching capability (SWACT) of the integrated services digital network (ISDN) call processing data (including loop maintenance) in the ISDN access controller (IAC).

FEATURE DESCRIPTION

This feature provides a warm SWACT capability by switching the activity from the active unit of the IAC to the inactive unit without disturbing established calls. The active unit handles all of the call processing and hardware control responsibility while the inactive unit is in a standby mode.

Three main causes of a warm SWACT are unrecoverable software defects, hardware faults in duplicated hardware components of the IAC, and on command from the central control (CC).

The main principle of handling a warm SWACT is to continuously synchronize data between the two units of the IAC in order that when a SWACT occurs, the inactive unit can continue serving established calls. Besides handling static data which are downloaded from the CC, this SWACT software must also transfer call-affected dynamic information from the active unit to the inactive unit. This feature provides warm SWACT for ISDN call processing data which includes:

- ISDN loop and its associated logical terminals' states
- B channels in use and their user identifier
- ISDN terminal logical links in use between the IAC and DCH
- ISDN terminal identifiers

This feature requires feature IAC SWACT for ISDN transport services.

Ref: BC2233
BC2096 ISDN IAC SWACT FOR TRANSPORT SERVICES

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CAPACITY
Feature	INCREASE MAXIMUM NUMBER FOR ISDN TERMINAL PROFILES
Feature no	F6385

FEATURE SYNOPSIS

This feature expands the logical terminal capacity of the DMS-100 family switch to 32 logical terminal groups.

FEATURE DESCRIPTION

Before a physical terminal can enter or receive calls it must be associated with a terminal profile. For ISDN a terminal profile is called a logical terminal. Each logical terminal is assigned a unique Logical Terminal Identifier (LTID). The number of possible LTIDs limits the number of logical terminals and hence physical terminals that can be supported.

The LTID consists of two parts: LTGRP and LTNUM. The LTGRP names a group of logical terminals. The LTNUM is a number between 1 and 1022 which identifies a logical terminal within a group.

This feature allows up to 32 logical terminal groups to be defined in the newly created Table LTGRP.

The expansion to 32 groups means that up to 32000 LTIDs can be defined.

Ref: FDOC AC0356

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	TABLE CONTROL
Feature	TABLE CONTROL FOR ISDN BRA FUNCTIONAL SIGNALLING
Feature no	F6389

Synopsis

This feature provides enhancements to support functional signaling on the Integrated Services Digital Network (ISDN) Basic Rate Access (BRA) interface:

- * Parameter AUTHORIZED BEARER SERVECES is added to Table LTDEF (logical terminal definition table). Bearer services are now associated with functional logical terminals (FLT) instead of individual call appearances.
- * Maximum number of FTs supported on a BRA interface is increased from one to eight.
- * QLT (query logical terminal) command displays LTCLASS (logical terminal class) and bearer service restrictions for a queried logical terminal.

Implementation

Table LTDEF defines the authorized bearer services associated with FLT. If the option field is left blank, the bearer services for the FLT default to authorization of all available services. Available services are: Voice, Voiceband, Circuit Mode Data and Packet Mode Data. Bearer services can be set to "not authorized" by entering one or more of : NOVOICE, NOVBD, NOCMD or NOPMD in the option field.

Table LTDEF can now contain up to eight entries for BRA LTs; a BRA LT has field LTCLASS = "BRAFS".

The QLT command now displays LTCLASS, which is one of:

- * BRAKS (BRA Key-Set)
- * BRAFS (BRA Functional Signaling)
- * PRA (Primary Rate Access)

For all PRA FLT and BRA FLT with B or BD access privilege, bearer services for which the FLT is not authorized is displayed.

Additional data storage requirements for this feature:

- * approximately six thousand words for 1 to 1000 terminals
- * approximately twelve thousand words for 1001 to 2000 terminals

and so on, in increments of six thousand words.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

A maximum of eight FLT's are supported per loop.

A maximum of two of the following can be on one loop: B-channel access, provisioned B-channel, combined circuit and packet switching using D-channel.

Authorized Bearer Services are not available for stimulus logical terminals.

BC (bearer capability) parameter for option field in Table LTDEF is not compatible with functional BRA DNs.

Service orders for functional signaling are not supported.

BC SFC/AF (F6384) are incompatible: functional DNs may not be assigned individual BCs.

Packet Mode bearer services are not supported.

Reference: FDOC AC0380

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	BERT FOR ISDN BASIC ACCESS LOOPS
Feature no	F6532

FEATURE SYNOPSIS

The purpose of this feature is to enable bit error rate test to be performed at 56 kbps or 64 kbps on a per b-channel basis for ISDN basic rate access loops using existing DMS integrated BERT facility to provide a measure on the service quality and to isolate sources of errors. Furthermore, it can be used to verify whether service has been restored to its required performance level.

FEATURE DESCRIPTION

This feature will provide the following capabilities:

1. BERT at 56 or 64 kbits/sec on a per b-channel basis for ISDN loops with either full frame loopback or single b-channel loopback set.
2. Per line test results storage.
3. Single b-channel seize and release mechanism.
4. Monitor the state of b-channel in the control position by messaging to the b-channel manager (BCM) in the ISDN access controller (IAC).

Ref: FDOC AC0105, AL0596

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN LCM CC MAINTENANCE III
Feature no	F6570

FEATURE SYNOPSIS

This feature extends the number of XMS-based Peripheral Module DS30A links which are supported by the ISDN Line Concentrating Module to 18.

FEATURE DESCRIPTION

In the ISDN 1C architecture, the ISDN Line Concentrating Module is capable of terminating 18 DS30A C-side links. Therefore, the LCM maintenance task in the Central Control has been modified to allow all these links to be configured.

Ref: FDOC AC0294

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	SERVICES
Feature	SERVICE PARAMETERS
Feature no	F6572

FEATURE SYNOPSIS

This feature provides some of the datafill requirements for the DMS-100 Family tables associated with the initial trials of Functional Signalling for the Basic Rate and Primary Rate service parameters.

FEATURE DESCRIPTION

DMS-100 Family will use the logical terminal as the key instrument for both basic rate and primary rate interfaces. The logical terminal will be used as the basic unit of datafill for both interfaces, resulting in datafill procedures which are very similar regardless of which type of physical interface is used to provide them. The tables and more precisely the parameters included in this feature are a subset of the subscription parameters required for ISDN primary and basic rate access.

The service parameters for the ISDN interface are set and changed by the LTDEF and LTMAP tables. A new LTDATA table is used to store additional service related data associated with the Logical Terminal Identifier (LTID).

Ref: AC0269, AC0211

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN BRA OPTICAL LINE CARD MTCE
Feature no	F6629

FEATURE SYNOPSIS

This feature provides maintenance support for the optical fiber-based ISDN line card (OISLC) and its low-speed network interface (IONI).

FEATURE DESCRIPTION

The OISLC can be datafilled as a valid ISDN line card code in Table LNINV and posted at the LTP level of the MAP.

The responses to the MMI command SUSTATE, LOOPBK, and DIAG have been modified.

The Status Query command, SUSTATE, indicates the status of the OISLC and IONI.

The Loopbk Control command, LOOPBK, allows loopbacks to be operated and released to test continuity of connections (using the DCHCON command) and to measure transmission performance through the OISLC and IONI (using the BERT command).

The Diagnostics command, DIAG, runs tests, such as laser status check, IONI all power check, and AC power check on the OISLC and IONI.

Ref: FDOC AL0735

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESSING
Feature	ISDN LCM CALL PROCESSING
Feature no	F6632

FEATURE SYNOPSIS

This feature provides the ISLM call processing capability on the LCMI hardware. This can be translated to having the ability to make ISDN calls with static port and channel connections in the LCMI.

FEATURE DESCRIPTION

In the ISLM, all ISDN call processing relied on permanently nailed up connections through the ISLM. Thus XPM call processing always used the same p-side port and channel for any given B-channel. In the LCMI, the connections will also be static to provide the same ISDN call processing capabilities.

This feature provides the first of the two development stages required for call processing on the LCMI. The second stage of this development process will provide the following features:

- 1) P-phone and data unit call processing.
- 2) Dynamic p-side channel allocation to allow for B-channel concentration.
- 3) Use of the LCMI C-side port expansion.

Since all call processing is done with static connections, the drawer and circuit locations for the ISDN line cards are also pre- assigned. This feature restricts the number of ISDN line cards to a maximum of 58. Support of p-phone and data unit is not provided in this feature.

Ref:

AC0215 ISDN LCM Line Maintenance Support
AL0483 ISDN LCM CC Maintenance II
AC0181 ISDN LCM Diagnostics
AC0218 ISDN LCM Channel and Line Control I
AC0297 ISDN LCM Channel and Line Control II

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	ENHANCEMENT
Feature	DCH ENHANCEMENTS FOR ISDN FUNCTIONAL SIGNALLING
Feature no	F6647

FEATURE SYNOPSIS

This feature enhances the D-channel handler firmware to allow:

- high speed primary rate access communication at layer 2 on the D-channel,
- functional signalling capabilities for basic rate access at layer 2 on the D-channel. This includes the addition of broadcast messaging and frames with larger information fields.

FEATURE DESCRIPTION

All the enhancements provided by this feature reside in the software which is downloaded to the D-channel handler's (DCH's) master processor. This feature introduces code to support functional signalling in the Link Access Protocol on the D-channel (LAPD) for BRA. The implementation of functional signalling is, for the most part, the responsibility of layer 3. In order for functional signalling to be supported by layer 3, this feature provides layer 2 enhancements to support SAPI 0 broadcast data link connection and transmission of SAPI 0 I-frames and SAPI 17 frames with an information field up to 260 octets.

LAPD for PRA is introduced with this feature and the DCH firmware is adapted from the firmware previously developed for the BRA DCH. The maintenance, diagnostics and support subsystems remain the same. The only differences are in the LAPD subsystem which consists of the link state control, receive task, transmit task and link management.

Ref: AC0266

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	LOOP MAINTENANCE FOR ISDN LINE CARD NTB25AB
Feature no	F6648

FEATURE SYNOPSIS

This feature is intended to provide the following functionalities for the ISLC-1C line card.

- 1) Allow ISLC-1C line card identification in the ISDN DMS environment by providing datafill capability.
- 2) All ISLC-1C line card identification at the LTP level of the MAP.
- 3) Enable all loop maintenance features for ISLC-1C similar to those provided by the ISLC-1A and ISLC-1B line card.

FEATURE DESCRIPTION

The ISLC-1C line card is only for use in BCS-25 and greater releases. The following new additions will be done to implement this feature:

- 1) Define and bind into the system the new card code for ISLC-1C line card.
- 2) Software changes to allow datafilling of the ISLC-1C line card possible.
- 3) Changes to existing diagnostic S/W and create new code for ISLC-1C diagnostics.
- 4) Changes loop maintenance S/W to allow proper handling of the ISLC-1C line card.

Ref:

AL0167 ISDN Loop Maintenance I
AL0087 ISDN Loop Maintenance II
AC0214 ISDN LCM Call Processing I

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN LCM LINE MAINTENANCE SUPPORT
Feature no	F6649

FEATURE SYNOPSIS

The ISDN-LCM Line Maintenance Support feature is intended to provide the following capabilities:

- 1) Specify the allowable line types and the maximum number of lines that are datafillable in the ISDN-LCM.
- 2) Provide ability to datafill lines in the table LNINV for the ISDN-LCM.
- 3) Enforce the requirement for mixed line types support (EBS, data unit and ISDN).
- 4) Ensure that datafilled lines in the ISDN-LCM can be posted and maintained in the LTP level of the MAP.
- 5) Add capability in the CC to collect DTSR OM data from LCMS datafilled below on IAC.

FEATURE DESCRIPTION

This feature defines the basic CC maintenance required to datafill and maintain lines in the ISDN-LCM. Existing line maintenance will be used to maintain the lines datafilled on the ISDN-LCM. Once datafilled, the ISDN-LCM lines must be maintainable from the LTP level of the MAP. This feature will also be used in the 1C architecture, when the planned transition occurs (IAC replaced by the ISDN-LTC).

Ref:

AL0414 - ISDN LCM CC Maintenance I
AL0483 - ISDN LCM CC Maintenance II
AL0181 - ISDN LCM Diagnostics
AL0164 - ISDN LTC Maintenance
AC0216 - ISDN LCM XPM Maintenance Support I

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	DOCUMENTATION
Feature	ISDN LCM SOFTWARE
Feature no	F6650

FEATURE SYNOPSIS

This feature is intended to describe the BCS-25 deliverables of the LCMI firmware and software. In contrast to the ISLM, the LCMI software package is more comprehensive; both in terms of functionality and reliability.

FEATURE DESCRIPTION

Similar to the other DMS peripheral products, software for the LCMI is based on software originally developed for the LCM. In general, the LCMI operates at task level mode, whether in or out of service. The bootstrap mode is applicable only during certain stages of diagnostics, return to service procedures or in absence of any RAM resident program.

In addition to the operating system, a number of general modules provide the following:

- system timer facilities
- maintenance subsystem
- diagnostic interface
- audit manager
- monitor and debug facilities
- DMSX and interunit communication interface.

Other software modules, built on top of the general purposes modules provide the following functionality:

- drawer and line communication
- connection management
- dual unit control
- diagnostics
- ISDN loop maintenance

Ref:

AC0215 ISDN-LCM Line Maintenance Support
AC0214 ISDN-LCM Call Processing I
AC0181 ISDN-LCM Diagnostics
AC0180 ISDN-LCM Base Load Development

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	DIAGNOSTICS
Feature	ISDN LCM BASE DEVELOPMENT
Feature no	F6651

FEATURE SYNOPSIS

This feature consists of the ROM and base RAM loads for the ISDN LCM and has the following objectives:

- 1) Create a complete ROM load that provides the bootstrap loader and basic set of diagnostic functions.
- 2) Create a base RAM load from which application functionality will be built as part of other features.

FEATURE DESCRIPTION

The ISDN version of the LCM, although similar to the standard LCM, has several significant differences in the architecture requiring changes in the RAM and ROM loads.

The ISDN LCM has two additional Digroup Control Cards (DCC) which provides a dual unit node, configured in a loadsharing arrangement with takeover capabilities. Additionally, each processor has three interfaces to each of 8 physical drawers whereas the old LCM processor had only one control interface to each of 10 physical drawers.

These architecture changes resulted in changes to the standard LCM ROM and base RAM in order to achieve a phase 1C implementation. Some modules will be transported directly from the old LCM to the new ISDN LCM. Other modules will have to be modified first, then renamed and moved to the ISDN LCM ROM.

Ref: AC0180

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESSING
Feature	XPM ISDN CALL CAPACITY EXPANSION
Feature no	F6904

Synopsis

This feature increases ISDN peripheral capacity.

The maximum number of terminals that can be supported by ISDN peripherals is increased to 300 from the current 180. A call is a simultaneous circuit-switched ISDN call in one of the following states: connected, originating, terminating, on hold.

The display stores for ISDN and Electronic Business Set with Display (EBS) are consolidated so that:

- * Each Integrated Access Controller (IAC) can support up to 300 simultaneous circuit-switched ISDN calls.
- * Each ISDN line trunk controller/ISDN line group controller can support up to 300 simultaneous circuit-switched ISDN and EBS calls.

Implementation

Table KSETINV (DMS-100 Key Set Inventory) parameter FANUM (Feature Activation Number) specifies the upper bound on the range of feature activators for each logical terminal.

Actual call capacity can range from 180 to 300, depending on:

- * Average value of FANUM parameter in Table KSETINV: to support 300 simultaneous circuit-switched ISDN calls, the average FANUM must not exceed 28.
- * Number of non-ISDN calls on the peripheral: these include EBS, EBS, Custom Local Area Signaling Services (CLASS), POTS and trunk.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

A maximum of 300 ISDN and EBSD calls can be in process per ISDN peripheral.

Reference: FDOC AC0452

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESSING
Feature	ISDN LCM CALL PROCESSING II
Feature no	F6969

Synopsis

This feature extends the call processing capability of the ISDN Line Concentrating Module to include Electronic Business Set (EBS) and Data Unit calls.

Dynamic p-side channel allocation provides B channel concentration so that grade of service can be engineered based on the number of lines and c-side ports provisioned. The potential grade of service for ISDN Line Concentrating Module call processing is complete non-blocking. This fully utilizes LCMI c-side ports.

Implementation

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX106AA IBN - Display Features
- NTX142AA DS-1 64 KBPS Clear
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature removes the restrictions imposed by F6632 ISDN LCM Call Processing I, which specified which logical drawers and lines could be datafilled for the LCMI.

Limitations

The IAC can support a maximum of 72 ISDN lines.

Reference: FDOC AC0295

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	ENHANCEMENT
Feature	ISDN LCM C-CHANNEL INTERFACE ENHANCEMENTS
Feature no	F6970

FEATURE SYNOPSIS

This feature increases the C-channel message capability of the ISDN Line Concentrating Module (LCMI).

FEATURE DESCRIPTION

C-channel messages are primarily used for maintenance purposes. This channel allows the processor to communicate to the ISDN line card or the Network Terminator type 1 (NT1).

This feature increases the capability of the C-channel message interface to allow the processor to communicate efficiently to all 192 ISDN line cards.

Ref: FDOC AC0296

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	TRANSPORT
Feature	LCMI PROCESSOR UPGRADE SUPPORT
Feature no	F7168

Synopsis

This feature upgrades an LCMI NTZ6X51AA to NTB34AB-based processor. This provides additional memory and an interface to ringing generator hardware.

The feature includes:

- * diagnostics to verify the hardware and interfaces
- * firmware and software to support the additional memory

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature operates with an NTB34AB LCMI processor card.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AC0458

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	ADMINISTRATION
Feature	ISDN LTC ISP LOADER
Feature no	F7293

Synopsis

This feature provides the tools required to load and initialize the software for ISP (ISDN Signaling Pre-processor). Functions of the loader are to:

- * reset ISP
- * download the operating system to ISP
- * download application software to ISP
- * initialize operating system and applications software.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AC0289

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	DIAGNOSTICS
Feature	ISP DIAGNOSTICS
Feature no	F7294

Synopsis

This feature provides the firmware required so that software can be added to the ISDN Signaling Pre-processor (ISP) card. The firmware resides in the EPROM of the ISP card. ISP provides a communication channel between LTC MP and SP and DCH cards which terminate D channels. The functions provided are:

- * initialization for base hardware
- * diagnostics
- * debugger
- * terminal i/o information
- * exception handler

Two new circuit packs are introduced:

- * the ISP occupies one of the spare slots in the LTC SP
- * the D-channel handler occupies a DS-1 card slot.

Implementation

The code is initialized when the processor is reset.

The following diagnostics are provided for fault detection. They are invoked by the software, or during reset or loading.

- * MC68029 Maze Test: verifies operation of the processor
- * ROM Checksum Test: verifies CPU firmware ROM
- * DRAM Parity Test: ensures correct action if a memory location with incorrect parity is read
- * Sanity Timer Test: causes interrupt within a specified time period
- * Operating System Timer Test: ensures that timing interrupt occurs within a specified time period
- * SDMA Test: checks if ISP can read and write MP memory without error
- * Memory Test (destructive and non-destructive) performed for every byte of RAM to ensure that processor can read or write to RAM; destructive test destroys memory contents; non-destructive test preserves memory contents; default is non-destructive
- * SCC Test: verifies read and write operation of SCC registers and tests data transfer

Debugger functions are:

- * display, change, fill memory
- * display or set processor register
- * trace execution
- * set breakpoints
- * call subroutines
- * string search
- * test memory
- * disassembler

The terminal I/O interface allows the user to enter debug commands or load the ISP card from a terminal.

The exception handler takes care of internal and external exceptions. Exceptions with external causes are: interrupts (sanity timeouts or parity errors), address errors, bus errors or resets. Exceptions with internal causes trace exceptions, breakpoints or illegal instructions. Exceptions are handled by:

- * resets
- * bus timeout errors
- * trace exceptions
- * service calls
- * breakpoints
- * parity errors
- * sanity timeouts
- * general purpose handler which displays status information and enters the command mode

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The following functions are not provided:

- * loader
- * message interfaces between SP, MP, CC (Central Controller)
- * CC text message interface
- * HDLC chips initialization

Reference: FDOC AC0290

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN LTC PM MAINTENANCE I
Feature no	F7296

Synopsis

This feature provides Central Control (CC) software for the ISDN Line Trunk Controller (LTCI) and ISDN Line Group Controller (LGCI) that services:

- * maintenance requests supplied by Man Machine Interface (MMI)
- * unsolicited messages from the system for ISDN LTC and ISDN LGC

Implementation

The following commands are provided:

MMI Commands:

- * Post
- * Next
- * Disp
- * TrnSL
- * QueryPM

Maintenance Commands:

- * LoadPM
- * Offl
- * Tst
- * RTS
- * SWACT
- * QueryPM
- * Bsy

OM Group XPM has new keys LTCI and LGCI to provide measurements for this feature.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AC0292

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN LTC/ISP COMMUNICATIONS
Feature no	F7298

Synopsis

This feature provides:

- * synchronization of ISDN signaling pre-processor (ISP) with the other processors
- * communication between ISP and ISDN line trunk controllers (LTCI)

This feature introduces two new circuit packs in the LTCI: ISP and D Channel Handler (DCH).

Communication between the master processor (MP) and ISP supports stand-ard and long inter-processor communication buffers (IPC and LIPC).

Implementation

Initialization lets the MP and Signaling Processor (SP) know of the exist-ence of ISP.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature interacts with XPM's IPC, IPC audit and IPC initialization.

Limitations

MP/SP and MP/ISP communicate by direct memory access (DMA). DMA allows SP/ISP to read from and write to MP memory. DMA does not allow MP to access SP/ISP memory.

Reference: FDOC AC0301

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	ADMINISTRATION
Feature	ISDN DCH DEVICE INTERFACE
Feature no	F7299

Synopsis

This feature provides software for:

- * high-level data-link control(HDLC) communications support
- * initialization and management of circuits
- * R8071 ISDN/DMI link layer controller chip evaluation
- * functional testing
- * traffic monitoring

The R8071 chip provides concurrent access to 32 HDLC physical layer channels, each with variable rate and properties.

The feature resides in the DMS-100 ISDN LTC signaling preprocessor (ISP) and D Channel handler (DCH) circuit packs.

Implementation

ISP supports up to 32 64-kbit channels on one R8071 chip.

DCH supports a mixture of 16-kbit and 64-kbit channels using four R8071 chips.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This is a base feature for ISDN-LTC; it does not affect existing software.

Limitations

There are no limitations on the use of this feature.

Reference: FDOC AC0302

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESSING
Feature	ISDN LTC DCH SWACT SUPPORT
Feature no	F7300

Synopsis

This feature provides loop maintenance for the new D-Channel Handler (DCH) card in the ISDN Line Trunk Controller (LTCI).

Loop status can be determined for maintenance purposes. The status of P-side peripherals, DCHs, DS-30A link carrying D channel, and subscriber loops can be queried when they are put into or taken out of service, busied, or seized for maintenance.

Loop information such as the DCH and the channel number are now displayed at the MAP during continuity tests, loop diagnostic tests, and loop maintenance. ISDN Signaling Processor (ISP) statistics can now be viewed at the MAP.

Operational measurement (OM) data for the D channel are collected and passed to the OM system.

Implementation

PERFORM MAP level support is provided for ISDN peripherals LTCI and LGCI. There are three new commands:

- * PMact: information is displayed for MP and SP: number of processes running, call processing occupancy, background occupancy. This feature provides statistics for the ISP.
- * Delays
- * PFQuery: displays up to five PMs being monitored.

Two new OM groups, ISGBD and ISGBRA support this feature. These are documented in AC0475.

Log PRFM210 is modified by this feature.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature requires an LTCI equipped with BX02 DCHs.

Limitations

PRA D channels are not supported.

DTSR measurement for ISDN loops is not implemented.

Only one user can collect performance data from any peripheral at a given time.

PERFORM is only available for ISDN peripherals that use the ISP card: LTCI and LGCI.

PERFORM command "Delays" is not available for ISDN loops.

Table SPECCONN, parameter CONNTYPE cannot be set = "RESERVED" with this feature.

Reference: FDOC AC0366

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESSING
Feature	LTCI WARM SWACT
Feature no	F7304

Synopsis

This feature provides a warm switch of activity (SWACT) capability for the LTCI. If one LTCI unit develops problems, the other LTCI unit assumes processing tasks with only a minimal loss of service.

Implementation

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX106AA IBN - Display Features
- NTX142AA DS-1 64 KBPS Clear
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Only data for connected calls is supported over a warm SWACT.

Call processing and maintenance information transferred between units during a warm SWACT is lost.

Reference: FDOC AC0371

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	CALL PROCESSING
Feature	ISDN LTC LOOP EXPANSION
Feature no	F7307

Synopsis

This feature increases the number of loops supported in the ISDN Line Trunk Controller (LTCI) to 1024. Each loop can support up to 8 ISDN terminals. This feature also frees 2.5 kbytes of memory in the integrated access controller.

Implementation

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX106AA IBN - Display Features
- NTX142AA DS-1 64 KBPS Clear
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AC0445

Package	NTX750AB04 ISDN BASIC ACCESS(UPG. OF NTX750AA)
Feature set	MAINTENANCE
Feature	ISDN LTC - ISP AND DCH PERFORMANCE MONITORING
Feature no	F7353

Synopsis

This feature provides recovery from SoftWare ERRors (SWERRs) and TRAPs for the ISP (ISDN Signaling Processor) and DCH (D-Channel Handler). It prevents delays caused by shutdown of the ISP or DCHs from TRAPs.

Implementation

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX106AA IBN - Display Features
- NTX142AA DS-1 64 KBPS Clear
- NTX270AA New Peripheral Maintenance Package
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AC0476

NTX753AA02 Status: LTD ISDN FUNCTIONAL MODE BASIC RATE SERVICES

CALL PROCESSING	:	
ENHANCED XPM CALL PROCESSING FOR FUNCTIONAL SIGNALLING		F6379
ISDN BRA FUNCTIONAL SIGNALLING : CALL PROCESSING I		F6382
ISDN BUSINESS SERVICES	:	
ISDN BRA FUNCTIONAL SIGNALLING FEATURE ACCESS UTILITY		F6383
BUSINESS SERVICES	:	
MULTIPLE FUNCTIONAL SIGNALLING CALLS PER DIRECTORY NUMBER		F6384
CALL PROCESSING	:	
ENHANCED CALL PROCESSING FOR FUNCTIONAL SIGNALLING		F6386
BUSINESS SERVICES	:	
FUNCTIONAL SIGNALLING ACCESS TO MDC FEATURES		F6388

Package	NTX753AA02 ISDN FUNCTIONAL MODE BASIC RATE SERVICES
Feature set	CALL PROCESSING
Feature	ENHANCED XPM CALL PROCESSING FOR FUNCTIONAL SIGNAL
Feature no	F6379

Synopsis

This feature improves XPM call processing software that supports functional signaling basic calls on the DMS-100 ISDN basic rate access (BRA) interface. Two services are supported by this feature:

- * HOLD and RETRIEVE allow a user to place calls on hold so that new calls can be originated and accepted, and calls on hold can be retrieved.
- * ACO (additional call offering) offers additional functional calls to a busy ISDN user.

These services allow an ISDN BRA user to manipulate multiple functional calls with one call connected to a B channel.

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Proprietary Business Set
NTX108AA IBN - Display Features
NTX142AA DS-1 64 Kbps Clear
NTX270AA New Peripheral Maintenance Package
NTX750AB ISDN Basic Access (upgrade of NTX750AA)
NTX901AA Local Features I

Activation and Deactivation

A SETUP message is broadcast to all terminals on the loop. Any terminal with the correct DN and bearer capability may accept the call with the CALL PROCEED, ALERT, or CONNECT message. An incompatible terminal that attempts to accept a call receives a RELEASE COMPLETE message with cause "Invalid call reference value."

If the destination does not respond within a pre-specified period of time, the originator receives the message "Destination not responding, call re-attempted". If the timer expires a second time, the user receives the messages "In-band information now available" and "No user responding".

A call can be rejected by sending the network a DISConnect, RELease or RELease COMplete message. The messages "In-band information now available" and "Call rejected" are returned.

A call can be released before it becomes active by sending the network a DISConnect, RELease or RELease COMplete message. The cause "Normal call clearing" is returned.

A call can be put on hold by sending a HOLD message with the call reference. A HOLD ACKnowledge message indicates that the hold request was successful. A HOLD REJect message with reason indicates that the request was not successful.

Auto-hold is a network-initiated hold that occurs when the user sends in a CONNect (connect to incoming call), RETRIeve (connect to call on hold), or SETUP (initiate new call) message.

A RETRIeve message with call reference identification requests connection to a call on hold. A RETRIeve ACKnowledge message indicates that the request is successful. A RETRIeve REJect message with reason for failure is sent if the request is not successful.

A terminal can alternate between functional calls using the HOLD and RETRIEVE messages.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

In order to make calls on a functional signaling terminal, the terminal must be datafilled and must have subscribed to a non-zero number of calls.

A maximum of one functional signaling DN per terminal is permitted.

Although the SETUP message is broadcast to all terminals on a loop, only one terminal is compatible with the offered call.

Supplementary services can not be requested for a call on hold.

The Q.931 call abort call state and transit network selection and user-user information elements are not supported.

Reference: FDOC AC0378

Package	NTX753AA02 ISDN FUNCTIONAL MODE BASIC RATE SERVICES
Feature set	CALL PROCESSING
Feature	ISDN BRA FUNCTIONAL SIGNALLING : CALL PROCESSING I
Feature no	F6382

FEATURE SYNOPSIS

This feature, together with the ISDN BRA functional signalling feature access utility, provides enhanced capability for the Integrated Access Controller (IAC). The IAC will have the ability to talk to functional signalling terminals for basic call control while retaining the ability to use stimulus signalling for feature access.

FEATURE DESCRIPTION

The Basic Rate Access (BRA) interface for the current version of the DMS-100 ISDN node supports stimulus signalling while allowing access to selected existing Meridian business services. Q.931 information messages from the ISDN keyset are processed by the ISDN BRA stimulus call processing software and the appropriate Q.931 messages are generated and sent to the user over the D-channel.

Functional call control capability provides the DMS-100 with the ability to support Q.931 functional signalling for basic call setup/ takedown. This feature provides the DMS-100 the ability to generate functional signalling messages from the network to the user while still retaining the capability to support stimulus signalling for accessing features.

Support for both ISDN BRA functional and stimulus signalling can be provided on the same loop and as well as on the same set.

Ref: AC0329

Package	NTX753AA02 ISDN FUNCTIONAL MODE BASIC RATE SERVICES
Feature set	ISDN BUSINESS SERVICES
Feature	ISDN BRA FUNCTIONAL SIGNALLING FEATURE ACCESS UTIL
Feature no	F6383

FEATURE SYNOPSIS

This feature implements the handling of BRA functional signalling from the user to the network. The objective of this feature is to add functional capability for call setup/takedown while retaining access to a large base of existing stimulus features.

FEATURE DESCRIPTION

This feature, which implements user-to-network messaging, contributes to the ISDN BRA functional signalling call processing feature that implements network-to-user messaging. This will add to the existing ISDN stimulus signalling physical set interface the ability to interpret incoming functional messages from an ISDN functional signalling terminal.

The requirements of this feature to support ISDN BRA messages are as follows:

- 1) Handle Q.931 stimulus messages received from a stimulus terminal.
- 2) Handle Q.931 stimulus messages received from a hybrid functional terminal.
- 3) Handle Q.931 functional messages received from a functional terminal.

The existing stimulus physical set interface will handle 1) and 2). Requirement 3) must be satisfied by a new functional physical set interface developed for handling functional messages.

Ref: AC0330, AC0329

Package	NTX753AA02 ISDN FUNCTIONAL MODE BASIC RATE SERVICES
Feature set	BUSINESS SERVICES
Feature	MULTIPLE FUNCTIONAL SIGNALLING CALLS PER DIRECTORY
Feature no	F6384

Synopsis

This feature provides assignment of functional signaling calls to DNs at the basic rate access (BRA) interface, using the CCITT Q.931 functional signaling protocol. A DN can be defined at a functional logical terminal as a single functional call (SFC) DN. The AFC feature can provide a DN with additional functional call capability.

Implementation

Display and maintenance commands at the MAP are identical to ISDN stimulus (non-functional) DNs. A loop consists of one to eight FLTs. A loop can be posted by DN, LEN or state. Display is in regular or inverse video. Regular video indicates that an AFC DN group is fully engaged. Display in inverse video indicates that the AFC DN group is engaged in one or more calls, but not the previously defined maximum number of calls.

The SFC DN is datafilled on an FLT through Table Control or SERVORD.

Table KSETLINE assigns options to DNs. "SFC" mnemonic is introduced by this feature.

Table KSETFEAT assigns features to stimulus logical terminals and FLTs. Blank keys on the FLT can be assigned as AFC members to a predefined SFC DN. "AFC" mnemonic is introduced by this feature. "AFC" is assigned to blank keys on the FLT for the SFC DN.

When AFC members are removed from Table KSETLINE, all associated AFC entries are automatically removed from Table KSETFEAT.

The following feature packages are necessary for this feature to operate with SFCs:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX106AA IBN - Proprietary Business Set
- NTX108AA IBN - Display Features
- NTX142AA DS-1 64 KBPS Clear
- NTX270AA New Peripheral Maintenance Package
- NTX750AB ISDN Basic Access (upgrade of NTX750AA)
- NTX901AA Local Features I

Activation and Deactivation

Multiple simultaneous calls are made from or to the same DN by using different keys or other terminal-dependent method (e.g., mouse) on a logical terminal.

Interactions

The following features are required to support interactions between SFC/AFC and existing DMS features:

- * F6379 Enhanced XPM Call Processing For Functional Signaling
- * F6386 Enhanced Call Processing For Functional Signaling
- * F6389 Table Control for ISDN BRA Functional Signaling

Without NTX753AA, all DN datafill is rejected on FLT.

Limitations

Only one call may be actively engaged in voice or data transmission at one time.

Only one SFC DN is allowed per FLT.

SFCs must be defined on an FLT.

Calls are made to and from AFC DNs subject to regular Meridian Digital Centrex line restrictions. For example, calls originating from AFC DNs with Denied ORigin (DOR) set are denied by the network; if Denied TerMination (DTM) is set, calls do not terminate on the AFC DN.

Incompatible MDC/ISDN features are blocked by this feature. Incompatible features are Bearer Capability (BC), Multiple Appearance Directory Number (MDN), Key Short Hunt (KSH), Uniform Call Distribution (UCD), Distributed Line Hunting (DLH), Automatic Call Distribution (ACD), Multi-Line Hunt (MLH) Directory Number Hunt (DNH) is allowed for SFC, but blocked for AFC.

Table KSETFEAT: AFC key must be greater than MASTER_KEY; tuples cannot be changed, they can only be added or deleted.

SFC/ AFC and Bearer Capabilities (BC) (Feature F6389) are incompatible. Functional DNs may not be assigned individual BCs. Authorized bearer services are assigned to FLTs. FLTs specify a BC, from within the assigned ABS, on a per call basis.

Reference: FDOC AC0377

Package	NTX753AA02 ISDN FUNCTIONAL MODE BASIC RATE SERVICES
Feature set	CALL PROCESSING
Feature	ENHANCED CALL PROCESSING FOR FUNCTIONAL SIGNALLING
Feature no	F6386

Synopsis

This feature provides call processing capabilities that conform to CCITT Q.931 message and signaling standards. The feature supports functional signaling calls on the Basic Rate Access (BRA) interface.

The following capabilities are provided by this feature:

- * Per-call Bearer Capability (BC): The following BCs are supported by DMS-100: speech, 56 kbps unrestricted. 64 kbps unrestricted, 64 kbps restricted, 3.1 khz audio.
- * Call Control Procedures for Functional Calls: Call originations can be en bloc or overlap.
- * Broadcast Setup: The SETUP message is broadcast to all terminals on the loop (up to eight) over the broadcast logical link. End-to-end alerting consists of an ALERT message on the D Channel and in-band audible ring-back on the B Channel.
- * Call Rejection: an FLT can reject a call before answering.
- * Call connection is provided between: BRA FLTs, BRA SLTs, IBN lines, Electronic Business Sets, Data Units, POTS lines, IBN trunks, POTS local trunks, POTS toll trunks, Inter-toll trunks including Equal Access, ANI trunks, Cama positions, PRA, ISUP, PBX trunks.

Implementation

Table TMTCNL defines treatment control. The cause-of-call-clearing makes use of existing DMS-100 treatments plus two new treatments defined by this feature: Call REjected (CREJ) and No Terminal ReSponding (NTRS). Tables affected by this change are those involved in routing for the new treatments: OFRT (office routing table), TONES (tones table), CLLI (common language location identifier table).

Table BCDEF defines bearer capabilities (BC) associated with a functional logical terminal (FLT).

Table BCCOMPAT defines compatibilities between BCs.

Table KSETFEAT assigns features to stimulus logical terminals and FLTs. Each call on an ISDN stimulus logical terminal can be assigned a BC; the default value for BC is speech for non-ISDN sets; default value is DataUnit for data units.

Two new registers, CREJ and NTRS, are added to OM group TREMTCM (customer miscellaneous treatment) for the two treatments added by this feature. These registers count the number of applications of these two treatments.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Proprietary Business Set
NTX108AA IBN - Display Features
NTX142AA DS-1 64 KBPS Clear
NTX270AA New Peripheral Maintenance Package
NTX750AB ISDN Basic Access (upgrade of NTX750AA)
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Packet mode data bearer service with bearer capabilities 64KX25 and Data Unit are not currently supported.

Functional BRA does not connect to operators, Emergency Service Bureau (ESB) lines and trunks, and Attendant Consoles. Calling Party Number (CGN) is not screened.

No screening of calling party number (CGN).

Only one terminal per loop can respond to the SETUP message.

If the CDN field or KP field in the SETUP message contains any digits, then the system assumes en-bloc sending.

Value of CGN field 'Type of Number' and 'Numbering Plan Indicator' is "unknown"; any other value is ignored.

Value of CDN fields 'Type of Number' and 'Numbering Plan Indicator' are "unknown". Any other value is not allowed.

If KP is used for en-bloc sending, a maximum of 24 digits can be sent; more digits cause the REL COM message to appear.

Reference: FDOC AC0379

Package	NTX753AA02 ISDN FUNCTIONAL MODE BASIC RATE SERVICES
Feature set	BUSINESS SERVICES
Feature	FUNCTIONAL SIGNALLING ACCESS TO MDC FEATURES
Feature no	F6388

Synopsis

This feature provides functional logical terminals (FLT) with access to existing DMS-100 Meridian Digital Centrex features:

- Business Set Automatic Dial (AUD)
- Business Set Call Back Queuing (CBQ)
- Business Set Call Forward Options (CFAC, CFB, CFD, and CFBD)
- Business Set Call Park (PRK)
- Business Set Call Pick-up (CPU)
- Business Set Make Set Busy (MSB)
- Business Set Ring Again (RAG)
- Business Set Speed Calling (SCL,SCS,SCU)
- Call Forward Validation (CFWVAL)
- Executive Busy Override (EBO)
- Executive Busy Override Exempt (EBX)
- Hunting (DNH)
- Key Hold (HLD)
- Last Number Redial (LNR, LNRA)
- Loudspeaker Paging Access (LSPKP)
- Release (RLS)

Each FLT can have up to 64 keys assigned to a combination of DN activators or keys, called CAP (Call APpearances), and feature keys, called FAP (Feature APpearances).

Implementation

Fdoc F6388 contains a description of each of the features listed above, with means to activate and deactivate the feature, restrictions and limitations, feature interactions, and references.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX106AA IBN - Proprietary Business Set
- NTX108AA IBN - Display Features
- NTX142AA DS-1 64 KBPS Clear
- NTX270AA New Peripheral Maintenance Package
- NTX750AB ISDN Basic Access (upgrade of NTX750AA)
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

All existing MDC interactions apply to the functional signaling environment.

Limitations

All existing MDC restrictions apply to the functional signaling environment.

Reference: FDOC AC0376

NTX790AA03 Status: LTD ISDN - PRIMARY RATE ACCESS BASE

MAINTENANCE	:	
ISDN PRA MAINTENANCE - B, D CHANNEL		F6395
TABLE CONTROL	:	
TABLE CONTROL - PRA TRUNKS		F6396
CALL PROCESSING	:	
INTEGRATED SERVICES ACCESS/CALLING NUMBER DELIVERY		F6397
FUNCTIONAL SIGNALLING	:	
FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT		F6398
FUNCTIONAL SIGNALLING - CONNECTION MANAGEMENT		F6399
CALL PROCESSING	:	
TABLE CONTROL - ISA ROUTING		F6540
ACLL PROCESSING	:	
ISA/CN DELIVERY ENHANCEMENTS		F6543
FUNCTIONAL SIGNALLING	:	
FUNCTIONAL SIGNALLING - INTERACTIONS		F6544
MAINTENANCE	:	
ISDN PRA MAINTENANCE - INTERACTION		F6545
TABLE CONTROL	:	
TABLE CONTROL - LTCALLS		F6546
TABLE CONTROL - XPM/CC CONNECTION		F6547
FUNCTIONAL SIGNALLING	:	
FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT NEHANCEMENTS		F6548
ACLL PROCESSING	:	
PRA/CCS7 INTERWORKING		F6549
MAINTENANCE	:	
ISDN PRA MAINTENANCE - TEST LINES		F6552
CALL PROCESSING	:	
XPM WARM SWACT		F6558
PRA INTERWORKING WITH SL-100 AGENCIES I		F6600
NETWORK DIAL PLAN DISPLAY		F7085
PRA INTERWORKING WITH DMS TRUNK GROUP TYPES		F7350
MAINTENANCE	:	
ISDN PRA MAINTENANCE - INTERACTIONS II		F7364

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	MAINTENANCE
Feature	ISDN PRA MAINTENANCE - B, D CHANNEL
Feature no	F6395

FEATURE SYNOPSIS

The purpose of this feature is to provide basic maintenance for PRA B channels. This feature will provide the capability to take a 'B' channel that has been datafilled and perform the associated change of state.

FEATURE DESCRIPTION

This feature describes how PRA B and D channel maintenance will work. This feature is based on existing AB trunk maintenance and provides the capability to take a 'B' channel that has been datafilled in table TRKMEM, or a 'D' channel in STINV and change it's state.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	TABLE CONTROL
Feature	TABLE CONTROL - PRA TRUNKS
Feature no	F6396

FEATURE SYNOPSIS

For the initial trials of PRA the basis subscription parameters are for the DMS-100. These parameters are merged with existing DMS concepts to meet NT PRA specification.

FEATURE DESCRIPTION

This feature provides the basic subscription parameters for ISDN PRA on the DMS-100 and SL-100. They use data table for subscription information. Modified subscription parameters are created to define PRA characteristics. This feature does not change the way existing features work.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	CALL PROCESSING
Feature	INTEGRATED SERVICES ACCESS/CALLING NUMBER DELIVERY
Feature no	F6397

FEATURE SYNOPSIS

PRA introduces functional signalling on the DMS-100 which requires a new CC/XPM messaging, signalling control protocol (SCP). This requires additional call processing to handle the new messages.

FEATURE DESCRIPTION

The PRA interface is similar to IBN trunks on a DS-1 link. However, existing IBN software does not give as high level intent information to and from XPM to control Q.931 signalling protocol. This requires a new protocol between CC and XPM, SCP. This feature introduces the additional call processing required to handle the functional signalling associated with PRA.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	FUNCTIONAL SIGNALLING
Feature	FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT
Feature no	F6398

FEATURE SYNOPSIS

This feature provides parsing and generation of Q.931 based functional signalling and management of PRA interface B-channels for ISDN Access Controller (IAC).

FEATURE DESCRIPTION

Functional signalling protocols such as Q.931 require generation and processing of more intelligent functional messages thus requiring a more intelligent XPM.

The signalling Manager (SIGMAN) provides these signalling management function interfaces to the connection manager (CONMAN) and communication to the CC on IAC.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	FUNCTIONAL SIGNALLING
Feature	FUNCTIONAL SIGNALLING - CONNECTION MANAGEMENT
Feature no	F6399

FEATURE SYNOPSIS

The ISDN Connection Manager (CONMAN) is used to implement CC supervision and functions related to establishment, monitoring and takedown connections for basic call. This feature also provides the interface between CONMAN and signalling manager (SIGMAN).

FEATURE DESCRIPTION

With the advent of intelligent ISDN terminals the peripherals are required to understand complex messages and process them before sending messages to CC for supervision.

This feature implements CONMAN for ISDN PRA for the ISDN ACCESS CONTROLLER. The functions provided are communication with the CC, interface with the SIGMAN and interaction with trunk maintenance and B-channel manager for PRA basic call.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	CALL PROCESSING
Feature	TABLE CONTROL - ISA ROUTING
Feature no	F6540

FEATURE SYNOPSIS

This feature allows calls of six different call types (Public, Private, WATS, INWATS, TIE, and FX) to coexist on the same trunk group.

FEATURE DESCRIPTION

This feature makes changes to tables IBNRTE, OFRT, and subtable RTEFEEF. A new route selector, Integrated Service Access (ISA), is added to these tables. This route selector routes calls to a specific trunk group.

Ref: FDOC AD0859

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	ACLL PROCESSING
Feature	ISA/CN DELIVERY ENHANCEMENTS
Feature no	F6543

FEATURE SYNOPSIS

This feature allows calls of different call types to coexist on the same Primary Rate Access (PRA) trunk group. The call types include: public, private, OUTWATS, INWATS, Foreign Exchange, and tie.

FEATURE DESCRIPTION

This feature allows different types of calls to be routed over a PRA trunk by selecting any one of the B-channels over a PRA.

A new route selector, ISA, is added to Tables IBNRTE, OFRT and the RTEREF subtables of Tables HNPACONT and FNPACONT. From these tables, the trunk group CLLI, the call type, and possibly the NPI are extracted and used to route the call over a PRA trunk.

The call type and the Logical Terminal Identifier (LTID) are used to index Table LTCALLS. The field XLARTE in Table LTCALLS indicates how the digits are to be translated.

Ref: FDOC AC0273

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	FUNCTIONAL SIGNALLING
Feature	FUNCTIONAL SIGNALLING - INTERACTIONS
Feature no	F6544

FEATURE SYNOPSIS

This feature provides extensions to the feature processing environment (FPE) to provide for correct interaction of Primary Rate Access (PRA) with other features.

FEATURE DESCRIPTION

The primary purpose of this feature is to make it possible for PRA interface to interact with other features and provide layer 3 call control capabilities within the FPE involving PRA. This feature provides the support within the FPE utilities and architecture in order to generate and receive Q.931 messages and to interact these messages to the relevant feature application which process them.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	MAINTENANCE
Feature	ISDN PRA MAINTENANCE - INTERACTION
Feature no	F6545

FEATURE SYNOPSIS

This feature (ISDN PRA trunk maintenance), provides a means of monitoring and detecting problems using a subset of existing trunk maintenance commands. It also provides a correlation between the DCH and DS-1 states with the associated B-channel states.

FEATURE DESCRIPTION

This feature is accessed by using a subset of the existing trunk maintenance commands from the TTP, MANUAL and monitor levels of the MAP.

In PRA, we do not necessarily have B and D channels in the same DS-1 and the functionality of PRA is dependent upon an in-service DCH (ST). A correlation has been made between DCH and DS-1 states with the associated B channels.

Ref:

NTP 297-1001-516 DMS-100 Family Trunk Maintenance Reference Manual
BC2092 - ISDN ST MTCE
BC2090 - IAC MTCE Support for Manufacturing
AG0521 - Switch Bit Error Rate Indicator for Trunks
BC2097 - ISDN Logical Link Management

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	TABLE CONTROL
Feature	TABLE CONTROL - LTCALLS
Feature no	F6546

FEATURE SYNOPSIS

This feature is based on the table LTCALLS for provisioning the PRA interface. The LTCALLS table contains service related data associated with the various call types.

FEATURE DESCRIPTION

An application of PRA is Integrated Services Access (ISA) which gives access through one common integrated facility. In order to fulfill the concept the LTCALLS table (consists of LTID and call type), defines service related data associated with the call type. LTID is the fundamental key for the interface service table.

The call types are defined as follows: Public, Private, WATS, INWATS, FX and TIE.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	TABLE CONTROL
Feature	TABLE CONTROL - XPM/CC CONNECTION
Feature no	F6547

FEATURE SYNOPSIS

This feature provides for the downloading of static data from the DMS-100 to the ISDN Access Controller (IAC).

FEATURE DESCRIPTION

This feature describes the types of static data tables which will be sent to the IAC from the DMS-100 CC. It also describes the nature of events which will cause each of these tables to be produced.

The data is sent to IAC in a series of tuples which are sent in the form of CC-XPM message. Each tuple corresponds to a table operation (add, delete, modify etc), and will contain the appropriate data required for action to a particular entry in the XPM table.

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	FUNCTIONAL SIGNALLING
Feature	FUNCTIONAL SIGNALLING - SIGNALLING MANAGEMENT NEHA
Feature no	F6548

FEATURE SYNOPSIS

This feature provides an audit system to verify the integrity of Primary Rate Access (PRA) call processing data structures.

This feature also supports retransmission of Q.931 restart message, if there is no response to the last Q.931 restart message sent.

FEATURE DESCRIPTION

The audit system provided by this feature recovers data blocks that contain invalid, inconsistent or mismatched data.

If there is no response to a Q.931 restart message, the audit system retransmits the message until the remote side acknowledges it.

Ref: FDOC AC0444

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	ACLL PROCESSING
Feature	PRA/CCS7 INTERWORKING
Feature no	F6549

FEATURE SYNOPSIS

This feature provides a mapping of the Primary Rate Access (PRA) protocol to the Integrated Services Digital Network User Part (ISUP) protocol.

FEATURE DESCRIPTION

This feature addresses the protocol mapping for PRA to ISUP at the message level, at the parameter/information element level and finally, at the bit level.

This mapping allows these two message-based protocols to work together, thereby providing ISDN capability throughout the public network.

Ref: FDOC AC0339

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	MAINTENANCE
Feature	ISDN PRA MAINTENANCE - TEST LINES
Feature no	F6552

FEATURE SYNOPSIS

This feature implements the following means of monitoring trunk operations, and of detecting and isolating problems:

T101 Test Lines

Call Transfer from Trunk Test Position

Interactive Bit Error Rate Tester

Translation Verification from Trunk Test Position

Automatic Trunk Testing

FEATURE DESCRIPTION

T101 Test Lines

The T101 test line is used as a communication channel between two offices. It is not actually a test.

Call Transfer

Call Transfer (CALLTFR) transfers the call processing connection to the Trunk Test Position control position.

Bit Error Rate Tester

The Bit Error Rate Tester monitors and measures the Bit Error Rate of a DMS-100 switch.

Translation Verification

The TRNSLVF command from the TTP level of the MAP performs three functions:

Verifies the translation and routing data

Traces the data used to translate the incoming digits into a route

Displays the digits to be outpulsed on the posted circuit for a given test line code.

Automatic Trunk Testing

Automatic Trunk Testing provides automatic testing of outgoing trunks, the outgoing portion of two-way trunks, and the associated facilities.

Ref: FDOC AD1294

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	CALL PROCESSING
Feature	XPM WARM SWACT
Feature no	F6558

Synopsis

This feature provides a warm switch activation (SWACT) capability for XPM. If one XPM unit develops problems, the other XPM unit assumes processing tasks with only a minimal loss of service.

XPM SWACT is used:

- * to upgrade the BCS
- * to maintain call processing when an unrecoverable software trap occurs or a hardware fault is detected
- * for maintenance purposes

Implementation

To use XPM warm SWACT for a BCS upgrade:

- * the inactive unit is busied
- * new software is loaded
- * the inactive unit is returned to service
- * wait for data synchronization
- * perform warm SWACT

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Proprietary Business Networks - Basic
NTX108AA IBN - Display Features
NTX142AA DS-1 64 kbps Clear
NTX270AA New Peripheral Maintenance Package
NTX750AB ISDN Basic Access (upgrade of NTX750AA)
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature interacts with TPT SWACT, AB Trunk SWACT, ISDN Logical Link Management

Limitations

Only stable calls in the active unit with copies of the calls set up in the inactive unit are preserved during a warm SWACT.

Timer T315 is affected by a warm SWACT.

In-process messages do not survive a warm SWACT.

Reference: FDOC AG1298

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	CALL PROCESSING
Feature	PRA INTERWORKING WITH SL-100 AGENCIES I
Feature no	F6600

FEATURE SYNOPSIS

This feature provides all direct Primary Rate Access processing capability for the Integrated Business Network Attendant Console and Integrated Voice and Data (IVD) sets on the SL-100.

FEATURE DESCRIPTION

This feature provides layer 3 call control for the attendant console and the IVD set. These are two of the IBN agents not supported in basic call processing. This feature will allow the connection of the attendant console and IVD sets with the compatible agents for basic call processing.

Besides providing the capability for setting up a connection between a PRA interface and the attendant console, this feature also provides support of most of the existing attendant console features without any impact to the existing attendant console functionality.

Ref: AD0881, AC0280

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	CALL PROCESSING
Feature	NETWORK DIAL PLAN DISPLAY
Feature no	F7085

FEATURE SYNOPSIS

This feature formats a calling party number into a form consistent with the called party's dial plan. This reverse translation capability for calling numbers is provided through customer datafill of newly defined translation data tables.

The initial application of this feature consists of improving the existing Electronic Business Set display capabilities by displaying the calling number in a form which is dialable by the user.

FEATURE DESCRIPTION

This feature allows the customer to define a more uniform set of formatting rules based on the dial plan and has the added advantage that the number displayed may actually be used by the subscriber to recall the calling party.

The algorithms which determine the manner in which the calling party number is manipulated for display are defined through the datafill of two new translation tables, DNREGION and DNREVLXLA. Table DNREGION identifies groups of directory numbers belonging to the same region or community of interest, while Table DNREVLXLA provides digit manipulation algorithms based on the various regions defined in Table DNREGION.

These reverse translation tables are flexible enough to support any type of dial plan. Furthermore, they can be used to define algorithms for calls made over the public network as well as any number of private networks which may be supported by the office.

Ref: FDOC AG0981

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	CALL PROCESSING
Feature	PRA INTERWORKING WITH DMS TRUNK GROUP TYPES
Feature no	F7350

Synopsis

The Primary Rate Access Interworking to Meridian Digital Centrex feature allows an Integrated Services Digital Network (ISDN) Primary Rate Access (PRA) Interface to connect to the following DMS-100 call processing agents:

- * Automatic Message Recording 5 (AMR5) trunks
- * Coin lines
- * Dialed Loopback trunks
- * Operator (OP) trunks.

Specifically, this feature allows PRA to support the following additional call types:

- * PRA trunk calls that route to an AMR5 trunk group type, and calls from an AMR5 trunk group type to a PRA trunk
- * PRA trunk calls to Coin lines, and calls from Coin lines to PRA trunks
- * PRA trunk calls that terminate on a Dialed Loopback trunk.
- * PRA trunk calls that route to an OP trunk group type, and calls from an OP trunk group type to a PRA trunk

Implementation

No Operating Company action is required to implement this feature.

PRA trunk-to-AMR5 trunk connection supports basic voice connections and sends the billing number to the Centralized Automatic Message Accounting (CAMA) office.

AMR5 trunk-to-PRA trunk connection supports basic voice connections.

PRA trunk-to-Coin line and Coin line-to-PRA trunk connections support basic voice connections.

Since Dialed Loopback trunks provide a digital loopback from transmit path to receive path only, there is no Dialed Loopback trunk-to-PRA trunk call.

In the case of PRA trunk-to-Dialed Loopback trunk connection, the dialed loopback provides a digital connection from transmitted data to receive data only.

PRA trunk-to-OP trunk connection supports only basic voice connection.

OP trunk-to-PRA trunk connection is handled like a local or intertoll trunk-to-PRA trunk call.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTX100AA Integrated Business Networks - Basic
NTX106AA IBN - Proprietary Business Set
NTX108AA IBN - Display Features
NTX142AA DS-1 64Kbps Clear
NTX270AA New Peripheral Maintenance Package
NTX750AB ISDN Basic Access
NTX901AA Local Features I

Activation/Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing features.

Restrictions

This feature does not support the following:

- * Operator signaling, including coin control signaling on pay phones
- * Local Coin Overtime on pay phones
- * Call Hold features on AMR5 and Operator trunks.

Reference

FDOC AG1300

Package	NTX790AA03 ISDN - PRIMARY RATE ACCESS BASE
Feature set	MAINTENANCE
Feature	ISDN PRA MAINTENANCE - INTERACTIONS II
Feature no	F7364

Synopsis

This feature provides the interaction between CC maintenance and the XMS peripheral module (XPM) when events occur which require state changes to equipment. The following events cause changes in state:

- * system and IAC restarts
- * RTS of DS-1, DCH (D-Channel Handler), LL (Logical Link)
- * establish LL
- * system failure on DS-1, DCH or LL
- * maintenance of DS-1, DCH or LL
- * hardware failure

States can be change to:

- * out-of-service
- * CPB (Call Processing Busy)
- * CPD (Call Processing Deload)
- * INB (Installation Busy)
- * PMB (Peripheral Module Busy)
- * CFL (Carrier Fail)
- * Unchanged
- * LO

The CC or XPM changes the state of one or more of the following:

- * B-Channels in the CC and XPM
- * CPB and CPD trunks
- * XPM
- * LL

Implementation

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTXA40AA Directory Number (DN) Attributes
NTX100AA Integrated Business Networks - Basic (IBN)
NTX106AA IBN - Proprietary Business Networks - Basic
NTX108AA IBN - Display Features
NTX142AA DS-1 64 kbps Clear
NTX270AA New Peripheral Maintenance Package
NTX750AB ISDN Basic Access (upgrade of NTX750AA)
NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AD1615

NTX791AA02

Status: LTD PRA: NETWORK RING AGAIN

CALL PROCESSING	:	
NETWORK RING AGAIN - XPM SUPPORT		F6550
NETWORK RING AGAIN - CC SUPPORT		F7146
TANDEM NETWORK RING AGAIN ON PRA		F7229
MAINTENANCE	:	
OMS FOR NRAG ON PRA		F7258
CALL PROCESSING	:	
PRA/CCS7 NETWORK RING AGAIN		F7325
FACILITY REJECT MESSAGE ON PRA		F7326

Package	NTX791AA02 PRA: NETWORK RING AGAIN
Feature set	CALL PROCESSING
Feature	NETWORK RING AGAIN - XPM SUPPORT
Feature no	F6550

FEATURE SYNOPSIS

This feature provides the XPM support for Network Ring Again over a Primary Rate Access (PRA) interface.

FEATURE DESCRIPTION

Ring Again allows a user encountering a busy station to queue against that station and be recalled when it becomes idle. If the user accepts the recall, the original call is set up again, automatically.

This feature provides the software to support Network Ring Again for PRA.

Network Ring Again for PRA requires the implementation of connectionless transaction capabilities in the ISDN Access Controller. The messaging required for this feature is not associated with any call.

A protocol has been defined to support transaction signaling over a PRA interface. Transaction signaling is signaling not associated with an existing call.

Ref: FDOC AD1316

Package	NTX791AA02 PRA: NETWORK RING AGAIN
Feature set	MAINTENANCE
Feature	OMS FOR NRAG ON PRA
Feature no	F7258

Synopsis

This feature provides operational measurements (OMs) for connectionless signaling (signaling when no call is present) on Primary Rate Access (PRA). The OMs provided by this feature measure the volume of messages on the D channel generated by the initial application of NRAG (network ring-again) on PRA. Originating, terminating, and tandem messages are counted for each PRA trunk group.

Traffic measurements are used by the operating company to plan equipment requirements.

Implementation

New OM group PRAFAC (PRA FACility) monitors the activity of FACility and FACility REJect messages, which indicate the message traffic on the D channel. The registers in this group are:

- * FACMSGOR counts the number of FACility messages that originate at a switch.
- * FACMSGTM counts the number of FACility messages that terminate at a switch.
- * FACMSGTR counts the number of FACility messages transmitted by a switch.
- * DISNORTX counts the number of FACility messages discarded due to no routing translation for the given destination.
- * DISCNGST counts the number of FACility messages discarded due to congestion at the switch.
- * DISRTUNA counts the number of FACility messages discarded due to no available outgoing route.
- * REJMSGOR counts the number of FACility REJect messages that originate at a switch.
- * REJMSGTM counts the number of FACility REJect messages that terminate at a switch.
- * REJMSGTR counts the number of FACility REJect messages that are transmitted by a switch.
- * REJMSGDS counts the number of FACility REJect messages that are discarded by a switch.
- * REJNORTX counts the number of FACility messages that are rejected because there is no routing translation for the given destination.
- * REJCNGST counts the number of FACility messages that are rejected due to congestion at a switch.

* REJRTUNA counts the number of FACility messages that are rejected because there is no outgoing route for the given destination.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX790AA Primary Rate Access Base

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Registers DISCNGST and REJCNGST are not currently supported.

Reference: FDOC AD1508

Package	NTX791AA02 PRA: NETWORK RING AGAIN
Feature set	CALL PROCESSING
Feature	PRA/CCS7 NETWORK RING AGAIN
Feature no	F7325

Synopsis

This feature provides transmission of Network Ring Again (NRAG) messages between primary rate access (PRA) and common channel signaling (CCS7) trunks. Before this feature was available, NRAG messages could only be transmitted over one type of trunk, that of the original call. An NRAG message on an SS7 (signaling system 7) had to be routed to the destination switch through a Signaling Transfer Point (STP). These limitations are no longer in effect as a result of this feature.

By extending this feature across the network, NRAG increases revenues by allowing the operating company to provide services that increase productivity to businesses with multiple sites served by different central office switches.

Implementation

Subsystem INTERWRK is introduced to provide the new routing. INTERWRK is used instead of NRAG subsystem.

Table NETNAMES has new option for NETOPTS = "NINTRAG" (Non INTERworking Network Ring AGain), which results in messages being sent to the NRAG subsystem instead of new subsystem INTERWRK. This allows compatibility between systems with different versions of software.

Table NETNAMES has a new option for NETOPTS = "NMRTNRAG" (No Message Route Network Ring Again). The NRAG feature then works only with adjacent switches and switches connected by STP.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX790AA ISDN - Primary Rate Access Base

Activation and Deactivation

From an end user's perspective, the operation of NRAG is the same as nodal RAG.

Interactions

Each node in the network that wishes to offer this feature must contain the proper PRA and CCS7 networking software packages.

Limitations

Table NETNAMES options NETOPTS = "NMRTNRAG" and "NINTRAG" must be chosen together. They only apply when the original call is made over an SS7 trunk. Table NETNAMES option "NMRTNRAG" may not be successfully activated if the call is not SS7 throughout, because digits and PC are not returned in the RELease message.

A maximum of one SS7 selector is allowed per tuple in Table MSGRTE. The NRAG feature does not work between two switches that have different NRAG options in Table NETNAMES.

The original call must be entirely over PRA and SS7 trunks. The NRAG feature does not work over Per Trunk Signaling (PTS) trunks.

Reference: FDOC AD1673

Package	NTX791AA02 PRA: NETWORK RING AGAIN
Feature set	CALL PROCESSING
Feature	FACILITY REJECT MESSAGE ON PRA
Feature no	F7326

Synopsis

This feature provides DMS-100 with the PRA FACility REJect (FACREJ) message capability, defined by CCITT recommendation Q.932. This improves the operating company's ability to track routing problems in the ISDN network.

FACREJ returns the reason for not being able to route the FACility message. FAC transports service information for connectionless signaling, that is, signaling not associated with a call. This feature includes implementation of clearing for NRAG on PRA. Before this feature was available, FAC was rejected if routing was not possible at any node. With this feature, the reason for a message not being routed is returned to the originator.

Implementation

The feature is optional, and is specified for the network.

Table NETNAMES: option FACREJ activates FACREJ. If FACREJ is not activated, then the FACREJ message is not returned and the FAC message is discarded. Message types in FACREJ are:

- * 'No Translation for this Specific Address': network ID is found in Table MSGRTE, but the digits cannot be found in MSGRTE.
- * 'No Translation for Address of Such Nature': indicates that no route has been specified for this network
- * 'Unequipped Application': the switch does not support the feature.
- * 'Network Failure': the D-channel is not available.

The following message types are not supported:

- * 'Network Congestion': not supported because this cannot be detected in the software.
- * 'Application Congestion': not supported because TCAP message provides this information.
- * 'Application Failure'; not supported because TCAP message provides this information.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic

NTX790AA Primary Rate Access Base

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The system clears this feature for NRAG on PRA only. It is the responsibility of the originator to clear the feature when the FACREJ message is received for other applications.

Reference: FDOC AD1674

NTX801AA01 Status: RTM TOLL FEATURES I

MAINTENANCE AND TESTING	:		
TEST LINES:		1120-NONSYNCHRONOUS (ORIG.)	F0220
TEST LINES:		1181-SYNCHRONOUS (ORIG.)	F0221
TEST LINES:		OPEN CIRCUIT TERMINATION	F0223
TEST LINES:		SHORT CIRCUIT TERMINATION	F0227
SWITCHING AND TRANSLATION	:		
LOCAL CALL INTERCEPT			F0291
ADMINISTRATION	:		
TRAFFIC AND OPERATIONAL MEASUREMENTS (BASIC TOLL)			F0292
TOLL SERVICES	:		
VERIFICATION SWITCHING			F0294
ADMINISTRATION	:		
DIRECTORY ASSISTANCE CHARGING (411 CALLS TO AMA)			F0295
SIGNALING AND SUPERVISION	:		
SWITCHED MF/DP PULSE CONVERSION			F0298
SPECIAL BILLING CODES			F0299
SWITCHING AND TRANSLATION	:		
HOME/FOREIGN AREA TRANSLATION AND SCREENING			F0302
OFFICE CODE SHARING		THOUSAND DIGIT TRANSLATION	F0303
ROUTING ACROSS NPA BOUNDARIES			F0304
TRUNK CLASS SCREENING			F0305
UNAUTHORIZED/CODE BLOCKING			F0306
TOLL SERVICES	:		
SWITCHED ACCESS		FROM OPERATOR (NON-COIN)	F0307
SWITCHED ACCESS		TO OPERATOR (NON-COIN)	F0308
MAINTENANCE AND TESTING	:		
TEST LINES:		LOOP AROUND	F2281
ADMINISTRATION	:		
CLI - TRUNK TERMINATION			F2320

Package	NTX801AA01 TOLL FEATURES I		
Feature set	MAINTENANCE AND TESTING		
Feature	TEST LINES:	1120-NONSYNCHRONOUS	
Feature no	F0220		

DESCRIPTION

"Synchronous" type test lines are required for offices where ringing, tripping, and supervisory features are in the incoming trunk relay equipment. Marginal tests of the supervisory and tripping functions are provided.

A "non-synchronous" test line is required for all dial-type Class 5 offices including those having the synchronous-type test line. This line provides an operational test which is not as complete as the synchronous test but can be made more rapidly. The non-synchronous type is the only one required for those offices where marginal-type tests cannot be applied directly to the incoming trunk circuit as is frequently the case with step systems. However, test terminations provided for application of marginal-type tests to circuits, such as connectors in step-by-step offices, generally meet the minimum requirements for non-synchronous-type incoming trunk test lines and are frequently used for this purpose. In some instances, connector test terminations can be used to apply marginal tests to such circuits as toll transmission selectors.

The "loop around" test line in a class 5 office enables one person in a toll office to make 2-way transmission tests. Test calls directed to this test line are manually originated. It is used to measure the near-to-far loss of 4-wire or equivalent trunks. This test line has two terminations, each reached by means of separate customer-type telephone numbers. After having measured the far-to-near end loss of all trunks in the group (using 102 test line), one trunk is selected as a reference trunk. Using the reference trunk, one termination of this test line is dialed. Then taking each of the remaining trunks in turn, the other termination of this test line is dialed and a test signal is sent out over the trunk under test and received on the reference trunk. By knowing the far-to-near end loss of the reference trunk and the overall measurement of the two trunks, the near-to-far end loss is calculated by subtraction.

Package	NTX801AA01 TOLL FEATURES I	
Feature set	MAINTENANCE AND TESTING	
Feature	TEST LINES:	1181-SYNCHRONOUS (OR
Feature no	F0221	

SEE FEATURE NUMBER F0220

Package	NTX801AA01 TOLL FEATURES I	
Feature set	MAINTENANCE AND TESTING	
Feature	TEST LINES:	OPEN CIRCUIT TERMINA
Feature no	F0223	

DESCRIPTION

An open circuit termination is provided to test the stability of trunks having negative impedance type repeaters.

The features of this termination are as follows:

- 1) Trips machine ringing
- 2) Returns an off-hook signal to the calling end as long as the connection is held at the calling end
- 3) Provides an open circuit across tip and ring

REFERENCES

AT&T Notes on Distance Dialing
NTP 297-1001-516 in

Package	NTX801AA01 TOLL FEATURES I	
Feature set	MAINTENANCE AND TESTING	
Feature	TEST LINES:	SHORT CIRCUIT TERMIN
Feature no	F0227	

DESCRIPTION

A short circuit termination is provided to test the stability of trunks having negative impedance type repeaters.

The features of this termination are as follows:

- 1) Trips machine ringing
- 2) Returns an off-hook signal to the calling end as long as the connection is held at the calling end
- 3) Provides an AC short circuit across tip and ring

REFERENCES

AT&T Notes on Distance Dialing
NTP 297-1001-516

Package NTX801AA01 TOLL FEATURES I
Feature set SWITCHING AND TRANSLATION
Feature LOCAL CALL INTERCEPT
Feature no F0291

DESCRIPTION

LOCAL CALL INTERCEPT FEATURE IS REQUIRED IN A TOLL SWITCHING UNIT (DMS-200) FOR AN INCOMING CAMA OR AMR-5 TRUNK GROUP IF:

- 1) THE LOCAL ORIGINATING OFFICE IS INCAPABLE OF SCREENING LOCAL CODES (LIKE CERTAIN SXS CDO).
- 2) THE OPERATING COMPANY POLICY IS TO PERFORM LOCAL CALLING AREA SCREENING IN THE TOLL SWITCH IN PREFERENCE TO THE LOCAL SWITCH.

DATA TABLES ARE USED TO DETERMINE IF INTERCEPT IS REQUIRED AND THE CALL TREATMENT TO WHICH A CALL IS TO BE ROUTED.

REFERENCE

NTP 297-1001-451

Package	NTX801AA01 TOLL FEATURES I
Feature set	ADMINISTRATION
Feature	TRAFFIC AND OPERATIONAL MEASUREMENTS (BASIC TOLL)
Feature no	F0292

DESCRIPTION

THE ADDITIONAL OPERATIONAL MEASUREMENTS FOR A DMS-200 TOLL OFFICE INCLUDE:

(A) AMA MEASUREMENTS

- TOTAL AMA CALL ENTRIES ON TAPE
- AMA TAPE TRANSFERS

(B) CAMA ONI POSITIONS

- PEG COUNTS AND USAGE

(C) TRAFFIC ANALYSIS - A REGISTER (MAX 256) IS ASSIGNED TO COUNT CALLS BETWEEN A DESTINATION (OUTGOING TRUNK GROUP) AND A SOURCE (INCOMING TRUNK GROUP OR GROUP TYPE).

REFERENCE

NTP 297-1001-114

Package	NTX801AA01 TOLL FEATURES I
Feature set	TOLL SERVICES
Feature	VERIFICATION SWITCHING
Feature no	F0294

DESCRIPTION

VERIFICATION SWITCHING FROM AN OPERATOR IS USED IN THE FOLLOWING CIRCUMSTANCES:

- TO VERIFY THAT THE CALLING SUBSCRIBER HAS GIVEN THE CORRECT CALLING NUMBER IN ONI CALLS
- TO PROVIDE FOR THE CHECKING OR MONITORING OF "BUSY" OR "UNABLE TO CONNECT" LINES UPON REQUEST FROM THE FAR-END OPERATOR OR SUBSCRIBER

TO DO THIS, THE OPERATOR SEIZES AN OUTGOING TRUNK TO THE TOLL OFFICE AND DIALS THE SUBSCRIBER'S DIRECTORY NUMBER (WITH OR WITHOUT PREFIX DEPENDENT ON CONFIGURATION). THE TOLL OFFICE, RECOGNIZING THIS AS A VERIFICATION CALL, SEIZES A VERIFICATION TRUNK AND OUTPUTS THE DIGITS TO THE END OFFICE.

Package NTX801AA01 TOLL FEATURES I
Feature set ADMINISTRATION
Feature DIRECTORY ASSISTANCE CHARGING (411 CALLS TO AMA)
Feature no F0295

DESCRIPTION

'411' RECORDING ON MAG TAPE -----

THE ABILITY IS PROVIDED TO ALLOW RECORDING OF ALL '411' CALL DATA ON THE
CAMA TAPE.

Package NTX801AA01 TOLL FEATURES I
Feature set SIGNALING AND SUPERVISION
Feature SWITCHED MF/DP PULSE CONVERSION
Feature no F0298

DESCRIPTION

THIS PULSE CONVERSION FEATURE ALLOWS DESKS EQUIPPED WITH MF KEY-SETS DEDICATED TRUNK ACCESS TO DIAL PULSE OFFICES. ON TRUNK SEIZURE, THE MACHINE RECEIVES THE OPERATOR MF KEYPULSES AND OUTPUTS THE DIGITS ON A DP BASIS TO THE DISTANT OFFICE.

Package NTX801AA01 TOLL FEATURES I
Feature set SIGNALING AND SUPERVISION
Feature SPECIAL BILLING CODES
Feature no F0299

DESCRIPTION

ALSO KNOWN AS Q-Z BILLING OR DEPARTMENTAL BULK BILLING, THIS IS AN OFFERING TO BUSINESS CUSTOMERS (PBXS) WHERE TOLL CALLS CAN BE RECORDED AGAINST DEPARTMENTS, PROJECTS, SALES PERSONS OR OTHER GROUPS.

ANYONE WITHIN THE GROUP, WHO WANTS TO MAKE A LONG DISTANCE CALL, CAN PROVIDE THIS CODE TO THE CAMA SWITCHBOARD OR TOPS OPERATOR. THE OPERATOR WILL, IN TURN, KEY IN THIS CODE TO THE DMS TOLL OFFICE. DMS MACHINE PERFORMS A VERIFICATION AND, IF ACCEPTED, GIVES INDICATION TO THE OPERATOR WHO THEN ALLOWS THE CALL TO PROCEED. THE TOLL MACHINE RECORDS THIS BILLING CODE ON THE AMA TAPE.

IF THE VERIFICATION FAILS, THE OPERATOR WILL NOTIFY THE CALLING SUBSCRIBER ACCORDINGLY.

Package	NTX801AA01 TOLL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	HOME/FOREIGN AREA TRANSLATION AND SCREENING
Feature no	F0302

DESCRIPTION

3 DIGIT TRANSLATION (NPA OR NXX) PERMITS ROUTING OF CALLS DIRECT- LY TO OFFICES IN THE HOME NUMBER PLAN AREA.

6 DIGIT TRANSLATION PERMITS ROUTING CALLS DIRECTLY TO OFFICES IN OTHER NUMBERING PLAN AREAS.

Package	NTX801AA01 TOLL FEATURES I		
Feature set	SWITCHING AND TRANSLATION		
Feature	OFFICE CODE SHARING	THOUSAND DIGIT TRANS	
Feature no	F0303		

DESCRIPTION

THIS FEATURE ENABLES THE TOLL OFFICE TO PROVIDE DIFFERENT ROUTES FOR THOUSAND GROUPS OF DIRECTORY NUMBERS WITHIN THE SAME OFFICE CODE.

E.G. END OFFICE A 451-1XXX
END OFFICE B 451-2XXX

THE DMS MAKES USE OF THE 4-DIGIT TRANSLATION CAPABILITY TO ACHIEVE THIS, AND IS TERMED NON STANDARD DIGIT MANIPULATION.

Package	NTX801AA01 TOLL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	ROUTING ACROSS NPA BOUNDARIES
Feature no	F0304

DESCRIPTION

TWO CASES OF ROUTING ACROSS NPA BOUNDARIES ARE PROVIDED:

- A) FOR DIRECT ROUTING BETWEEN THE TOLL AND THE END OFFICES, THE NUMBERS OUTPULSED ARE 7D.
- B) FOR NON-DIRECT ALTERNATE OR NON-FINAL ROUTE, THE DIGITS OUTPULSED ARE 10D.

THIS IS ACHIEVED BY THE INHERENT DELETING AND PREFIXING CAPABILITIES OF DMS MACHINES.

Package	NTX801AA01 TOLL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	TRUNK CLASS SCREENING
Feature no	F0305

DESCRIPTION

SCREENING BY TRUNK CLASS OF SERVICE (CAMA, TWX, OPRC, ETC.) IS AVAILABLE IN DMS-200 AND IS ENTERED AS OFFICE DATA.

THE CLASS OF SERVICE SCREENING DETERMINES IF A CALL SHOULD ROUTE ACCORDING TO THE DIGITS DIALLED OR IF THE ROUTING SHOULD BE ALTERED DEPENDING ON THE ORIGINATOR'S CLASS OF SERVICE. A TRUNK GROUP MAY HAVE ITS OWN SCREENING CLASS OR MANY GROUPS MAY SHARE THE SAME CLASS.

Package NTX801AA01 TOLL FEATURES I
Feature set SWITCHING AND TRANSLATION
Feature UNAUTHORIZED/CODE BLOCKING
Feature no F0306

DESCRIPTION

CALLS DESTINED FOR THE UNAUTHORIZED CODES WILL BE BLOCKED AND THE CALLING STATION, VIA THE END OFFICE, WILL EITHER RECEIVE A RE-ORDER TONE OR BE RE-ROUTED TO AN ANNOUNCEMENT.

UNAUTHORIZED CODE BLOCKING CAN APPLY TO ANY ONE OF THE FOLLOWING:

- UNAUTHORIZED OFFICE CODE - UNAUTHORIZED AREA CODE - UNAUTHORIZED COUNTRY CODE

UNAUTHORIZED CODES ARE ENTERED AS OFFICE DATA.

CODE BLOCKING IN EMERGENCY SITUATIONS IS COVERED UNDER NETWORK MANAGEMENT FEATURE.

Package	NTX801AA01 TOLL FEATURES I		
Feature set	TOLL SERVICES		
Feature	SWITCHED ACCESS	FROM OPERATOR (NON-C	
Feature no	F0307		

DESCRIPTION

A TOLL SWITCHBOARD HAS INCOMING TRUNK APPEARANCES ON THE DMS SWITCH.
ALL OUTGOING CALLS FROM THE OPERATOR ARE TANDEMED VIA THE DMS SWITCH.

Package	NTX801AA01 TOLL FEATURES I		
Feature set	TOLL SERVICES		
Feature	SWITCHED ACCESS	TO OPERATOR (NON-COI	
Feature no	F0308		

DESCRIPTION

OPERATOR HANDLED OR ASSISTED CALLS HAVE TRADITIONALLY BEEN CARRIED OUT THROUGH THE USE OF 3 PORT OPERATOR OFFICE TRUNK (OO) TO THE TOLL CENTRE SWITCHBOARD OR THROUGH THE USE OF RECORDING COMPLETING TRUNK (RC) TO THE TOLL POINT SWITCHBOARD.

WITH DMS, THESE CALLS CAN BE SWITCHED THROUGH THE TOLL CENTRE VIA THE NORMAL CAMA OR TOPS TRUNK TO THE TOPS OR 3CL SWITCHBOARD.

WHERE THE 0 CALLS COME FROM SEVERAL END OFFICES, INTEGRITY OF THE GROUP WILL BE MAINTAINED BY THE DMS.

Package	NTX801AA01 TOLL FEATURES I		
Feature set	MAINTENANCE AND TESTING		
Feature	TEST LINES:	LOOP AROUND	
Feature no	F2281		

DESCRIPTION

The loop around test line (located in a class 5 office) allows one person in the toll office to make 2-way transmission tests. Test calls directed to this test line are manually originated. It is used to measure the near-to-far loss of 4-wire or equivalent trunks. This test line has two terminations, each reached by means of separate customer-type telephone numbers. After having measured the far-to-near end loss of all trunks in the group (using 102 test line), one trunk is selected as a reference trunk. Using the reference trunks, one termination of this test line is dialed. Then taking each of the remaining trunks in turn, the other termination of this test line is dialed and test power is sent out over the trunk under test and received on the reference trunk. By knowing the far-to-near end loss of the reference trunk and the overall measurement of the two trunks, the near-to-far end loss is calculated by subtraction.

Package	NTX801AA01 TOLL FEATURES I
Feature set	ADMINISTRATION
Feature	CLI - TRUNK TERMINATION
Feature no	F2320

DESCRIPTION

This feature is activated by an input command registering the called number external to the switching unit on a CLI list. All calls to the called number are identified whether the called party answers or not. An output record is generated as follows:

a) Trunk to Trunk (tandem)

Incoming trunk number, DN of called party, date and time

b) Line to Trunk (originating)

DN of calling and called parties, date and time. If the calling directory number cannot be identified, the number will be replaced by originating equipment number and tip and ring side identification, if available.

NTX802AA04 Status: RTM TOLL FEATURES II

ADMINISTRATION	:	
MAG TAPE UNIT FOR OM		F0270
SWITCHING AND TRANSLATION	:	
NAILED UP CONNECTIONS		F0272
MAINTENANCE AND TESTING	:	
104 ORIGINATING AND TERMINATING TEST LINE		F0277
SWITCHING AND TRANSLATION	:	
TANDEM SWITCHING- NO DIGITS INCOMING (2WAY TRUNKS)		F0289
TANDEM SWITCHING-NO DIGITS INCOMING (1-WAY TRUNKS)		F0290
MAINTENANCE AND TESTING	:	
105 TERMINATING TEST LINE		F0331
SWITCHING AND TRANSLATION	:	
COMBINED VERIFICATION AND TOLL COMPLETING		F0332
INWATS/OUTWATS		F0334
COMBINED MF TRUNK GROUPS (1+,0+,0-,COIN,NON-COIN)		F0829
MAINTENANCE AND TESTING	:	
REPEAT TWO TEST		F1084
E&M TEST		F1085
SWITCHING AND TRANSLATION	:	
LOCAL TANDEM (TOLL)		F2151
TOLL SERVICES	:	
COIN CONTROL LINE NUMBER METHOD		F2312

Package	NTX802AA04 TOLL FEATURES II
Feature set	ADMINISTRATION
Feature	MAG TAPE UNIT FOR OM
Feature no	F0270

DESCRIPTION

The operational measurement data is recorded on a 9 track magnetic tape and identified by header and trailer labels recorded in IBM format for standard tape labels. The labels are encoded in EBCDIC.

The tapes may then be processed down stream to produce long term reports or trend analysis.

REFERENCES

NTP 297-1001-114
NTP 297-1001-117
NTP 297-1001-518

Package	NTX802AA04 TOLL FEATURES II
Feature set	SWITCHING AND TRANSLATION
Feature	NAILED UP CONNECTIONS
Feature no	F0272

DESCRIPTION

This feature sets up a permanent trunk to trunk path through the network. The connection is commonly used for special services, such as permanent computer link.

To implement this feature, a new trunk group type of 'nu' has been defined. These groups have no special data other than the common group and member data. This group type may contain any existing trunk circuit type (analog or digital).

A new table NLUPCLLI has also been defined. This table is keyed by connection number. Two members from an 'nu' group may be selected and entered into a connection number tuple. When the tuple is changed with an 'y' in the connect field, the two trunk circuits are connected. Their state will change from idl to szd on the TTP. Conversely, when a connection is to be released, the tuple is changed with the connect field set 'n'. The network connection is released and the trunks return to idl.

A force release cannot be made from the TTP. The trunks must be first released via the NLUPCLLI table.

If a network failure occurs, the audit process will continually try to re-establish the connection.

If a cold restart occurs, the audit process will continually try to re-establish the connection.

Up to 1024 nailed up connections can be allowed per nailed up "trunk group".

This feature does not require any hardware.

Package	NTX802AA04 TOLL FEATURES II
Feature set	MAINTENANCE AND TESTING
Feature	104 ORIGINATING AND TERMINATING TEST LINE
Feature no	F0277

DESCRIPTION

The 104 Test Line is used for trunk testing. It enables 2-way transmission tests and one way noise checking.

The originating end sends a 1000 Hz tone to the terminating end which measures the near-to-far loss. The terminating end sends a 1000 Hz tone to enable the originating end to measure the far-to-near loss. After a timed interval the terminating end sends a 1000 Hz tone through adjustable pads which are equal to the previously measured near-to-far loss. This provides the near-to-far loss information to the originating end.

104 Terminating Test Line

The DMS responds to the incoming 105 code initiated from the originating end, switches the TTU/TTT as and when it is required, performs measurement or sends tones to the far end as described above.

104 Originating Test Line

The test is initiated from a TTP. The same common equipment is as in 104 Terminating Test Line. The results are displayed in real time on the terminal.

Package	NTX802AA04 TOLL FEATURES II
Feature set	SWITCHING AND TRANSLATION
Feature	TANDEM SWITCHING- NO DIGITS INCOMING (2WAY TRUNKS)
Feature no	F0289

DESCRIPTION

This feature is an add-on to the previous one (F0290 - Tandem Switching - No digit incoming - 1 way trunk). It enables the Tandem Switching - No digit incoming trunk group to be used as a two way group so that toll completing calls to the tributary can be completed over the same trunk group as 0- calls to the switchboard. It is also possible to specify whether the trunk group is joint control or calling party control.

Package	NTX802AA04 TOLL FEATURES II
Feature set	SWITCHING AND TRANSLATION
Feature	TANDEM SWITCHING-NO DIGITS INCOMING (1-WAY TRUNKS)
Feature no	F0290

DESCRIPTION

Calls arriving at the DMS-100/200 from tributaries are automatically switched to an outgoing trunk group upon seizure of the incoming trunk (i.e. no digits are received over the incoming trunk). The outgoing trunk group can carry dedicated or combined traffic and therefore utilizes digit prefixing capabilities where appropriate. In addition, calls from a number of incoming trunk groups can be switched to a common outgoing trunk group. It is also possible to specify whether AMA recording is required for this type of call.

Package	NTX802AA04 TOLL FEATURES II
Feature set	MAINTENANCE AND TESTING
Feature	105 TERMINATING TEST LINE
Feature no	F0331

DESCRIPTION

The 105 test line provides for automatic 2-way transmission and 2-way C-message weighting noise measurements on trunks. It is a hardware and translation feature. The hardware is a Northeast Electronic 105 Responder (TTS1050C) and 105 Test Line (A3111-12-900) housed in the Miscellaneous frame and requiring a trunk appearance (either E&M or Loop Trunk will do). This feature provides for 105 terminating test line capability. The DMS responds to the incoming 105 code initiated from the originating end, translate it into an outgoing trunk appearance which is connected to the responder via 105 test lines.

Package	NTX802AA04 TOLL FEATURES II
Feature set	SWITCHING AND TRANSLATION
Feature	COMBINED VERIFICATION AND TOLL COMPLETING
Feature no	F0332

DESCRIPTION

This feature allows a single trunk group to be used for both verification and toll completing traffic.

To differentiate between these two types of calls, the toll office and/or switchboard operator will prefix the verification calls with "00" followed by the NXX + XXXX or any other suitable code designated by the telco.

The DMS end office will analyse this prefix code and give the appropriate treatment.

Verification is accomplished using one of two methods:

- Normal call processing if the line is "normal" or "idle"
- If the line is busy, the verification path is bridged into the "busy" line via the test access path.

Package	NTX802AA04 TOLL FEATURES II
Feature set	SWITCHING AND TRANSLATION
Feature	INWATS/OUTWATS
Feature no	F0334

DESCRIPTION

a) Inwats

Inwats Wide Area Telephone Service (Inwats) is a form of long distance service which allows a subscriber to receive "telephone calls originated within a specified service area without a charge to the originating party". Inwats is handled by means of special code assignments consisting of a Special Area Code (SAC) '800' followed by one or more specific NXX codes for each telephone NPA.

Translation, routing and screening features are required in a toll office. DMS-200 can serve as an Originating Screening Office (OSO), tandem office and Terminating Screening Office (TSO).

b) Outwats

Outward Wide Area Telephone Service (Outwats) gives subscribers with this service a reduced rate for long distance to certain Service Areas. The CAMA facility of DMS-200 records details of Outwats calls on magnetic tape.

REFERENCE

AT&T Notes on Distance Dialing

Package NTX802AA04 TOLL FEATURES II
 Feature set SWITCHING AND TRANSLATION
 Feature COMBINED MF TRUNK GROUPS (1+,0+,0-,COIN,NON-C
 Feature no F0829

DESCRIPTION

In a combined MF trunk group, DMS-100 makes use of the travelling class mark (ST signal) in the MF called number sending sequence to identify the call type (0-, 0+, 1+) and the station class (coin, non coin).

The format is KP-7/10 digits - STX

where STX can be ST, STP, ST2p, ST3p as follows:

Combined Coin -----	Combined Non-Coin -----	Combined Coin and Non-Coin -----
ST 1 + digits	1 + digits	1 + digits (coin)
STP 0-, 0+ digits	0-, 0+ digits	0-, 0+ digits (coin)
ST2p		1+ digits (non-coin)
ST3p		0-, 0+ digits (non-coin)

Package	NTX802AA04 TOLL FEATURES II
Feature set	MAINTENANCE AND TESTING
Feature	REPEAT TWO TEST
Feature no	F1084

DESCRIPTION

E&M Lead Test (TEM)

The E&M lead test provides a rapid continuity, signalling, and pulsing test to a distant office. The test is normally applied to trunks with E&M leads which terminate in step-by-step offices. The test itself is a limited version of either the T103, TSYN or TNSS test line test. The test sequence consists of a connection to the distant office test line and ends when the answer (off-hook) signal is received.

Repeat 2 Test (TRP2)

The repeat 2 test ensures that a trunk circuit in the distant office disconnects properly within the allotted time when the connection in the originating office is taken down. The test consists of two tests made in rapid succession on the same trunk circuit. The first test is the standard operational test line test (either a T103, TSYN or TNSS) that is followed by an E&M lead test. If the distant office fails to disconnect after the first test, a 120 signal is returned in the second test.

Package	NTX802AA04 TOLL FEATURES II		
Feature set	SWITCHING AND TRANSLATION		
Feature	LOCAL TANDEM		(TOLL)
Feature no	F2151		

DESCRIPTION

A tandem call is an incoming call whose destination requires it to be switched through a subsequent office. DMS can be arranged to handle local tandem traffic. Call on incoming trunks are switched to outgoing trunks thus using the DMS office as an intermediate switching point between any two subtending end offices.

Package	NTX802AA04 TOLL FEATURES II		
Feature set	TOLL SERVICES		
Feature	COIN CONTROL	LINE NUMBER	METHOD
Feature no	F2312		

DESCRIPTION

Coin line calls from CDO's will tandem through the DMS-100/200 and terminate at a co-located 3 C switchboard. When a customer deposits a coin at a pay station and establishes a connection to the operator via an operator office trunk group, the trunk will send a class of service tone from the tributary office to indicate that the call originated from a coin line.

In order to enable the operator to collect or return coins deposited, another operator office trunk is selected by the operator who will key (MF) the following codes:

- 1) KP NNX 12 XXXX ST - COIN COLLECT
- 2) KP NNX 17 XXXX ST - COIN RETURN

where XXXX is the coin box station number. DMS-100/200 will translate and outpulse 12XXXX or 17XXXX to the tributary office (NNX will be deleted). This will initiate coin collect/coin return function and the operator will receive high tone (coin return) or low tone (coin collect) from the tributary office.

The trunk group used by the operator to perform the line number method of coin control will also be used for operator codes (3 or 6 digits) and toll completing (7 or 10 digits). Therefore, the trunk group will receive variable digits i.e. 3, 6, 7, 9 or 10.

Note:

a) Audible ringing is provided by DMS-200 if the 3CL switchboard cannot provide it.

b) The following is an example of implementation:

Coin lines originating from end offices will access 2-way operator office trunk to DMS-200. These trunks may be type SC or IS depending on application.

The incoming coin call presents a seizure to DMS-200 which tandems the call to a 3CL board on seizure and no digits.

When the 3CL operator answers (plugs cord in) the answer supervision is repeated by DMS-200 to the originating office. This answer supervision causes the originating coin trunk to generate a class of service tone to the operator (signalling a coin call) and also to collect the subscriber's initial deposit.

To perform the coin control function, the operator selects an MF outgoing trunk to DMS-200. This should be an IT type trunk. By key pulsing a certain string of digits, a call is set up to the originating office over a different trunk than that occupied by the incoming coin call. The certain set of digits contain the information that the originating office needs to identify the coin box line and whether coin collect or return is to be done. For example:

KP NXX 12 XXXX ST Coin Collect

KP NXX 17 XXXX ST Coin Return

Note that the digits are the NXX XXXX of the coin box line but that 12 or 17 is inserted between the office NXX and the line XXXX.

The specific digits outputted depend upon the DMS-200 translation but usually the NXX is deleted and the coin serving office receives 17XXXX or 12XXXX (i.e., the NXX is deleted).

Note that the operator could also access the serving office in the normal fashion of key pulsing the 7 digit NXX XXXX. Therefore, variable digit (pre)translation must be used.

This method requires that the coin serving NXX's do not have 17 or 12 thousands/hundreds line groups. That is, no lines of the form NXX 12XX or NXX 17XX.

A pretranslator is set up to pretranslate on NXX 12 and NXX 17 and set a route accordingly. All other forms would go through translation for route selection.

NTX806AA01 Status: RTM ENHANCED CALL FORWARDING - POTS

STATION FEATURES	:	
CALL FORWARDING - BUSY LINE (CFBL)		F2801
CALL FORWARDING - NO ANSWER (CFNA)		F2802
ENH. CALL FORWARDING	:	
MULTIPLE SIMULTANEOUS CALL FORWARDING		F2915

Package	NTX806AA01 ENHANCED CALL FORWARDING - POTS
Feature set	STATION FEATURES
Feature	CALL FORWARDING - BUSY LINE (CFBL)
Feature no	F2801

FEATURE SYNOPSIS

The call forwarding busy line (CFBL) feature allows calls attempting to terminate on a busy POTS station to be forwarded to another station within or outside the host DMS. The number of calls that may be forwarded is implicitly controlled by the available lines at the destination and explicitly controlled by the Telco, which has the ability to limit the number of simultaneous forwardings.

FEATURE DESCRIPTION

The CFBL feature allows calls attempting to terminate on a busy POTS station (called the base station) to be forwarded to another station (called the forward-to station). The number of the forward-to station is fixed, cannot exceed 24 digits in length and must be entered when the CFBL feature is assigned to a POTS line. The number of simultaneous forwardings permitted is also fixed and must be entered at that time also.

When a call cannot be forwarded busy because the base stations maximum simultaneous forwarding limit has been reached, the call is routed to treatment CFOV (call forward overflow). If the forward-to station is busy, the originating station receives busy treatment.

Ref: LSSGR FSD 01-02-1401
FDOC BR0801

Package	NTX806AA01 ENHANCED CALL FORWARDING - POTS
Feature set	STATION FEATURES
Feature	CALL FORWARDING - NO ANSWER (CFNA)
Feature no	F2802

FEATURE SYNOPSIS

Subscribers may wish to have calls answered at a different destination whenever they don't answer their phones. This results in more calls being answered and improved communications between the callers. CFDA (call forwarding don't answer) permits redirection of calls that would normally go unanswered. Hunt groups can be assigned CFGDA (call forwarding group don't answer) and individual members CFDA.

FEATURE DESCRIPTION

Before terminating a call to a POTS station, the switch determines if that station (referred to as the base station) has been assigned the CFDA option. If so, the switch applies ringing for a Telco specified length of time to the base station and audible ringing tone to the calling party. If the base station has not answered within that time, the call is handled in one of two ways according to the forwarded-to station's location:

1. The forwarded-to number is in the same switch: if forwarded-to station is idle, the call is forwarded to that station. If busy, the base station continues to be rung and the caller continues to receive audible ringing tone until the call is answered or abandoned.
2. The forwarded-to number is in a remote office: audible ringing tone is removed and the call is forwarded to the remote office, which takes control of the call. If the forwarded-to station is idle, the remote office applies ringing/audible ringing. If busy, the remote office returns busy tone to the calling party.

If for any reason (e.g. all trunks busy) the call cannot leave the office, it is treated as if forwarded to a busy in the same office ie, ringing/audible ringing until abandoned.

The number of calls to be forwarded is limited by the available lines at the destination up to a maximum specified by Telco (1-1024 range).

Ref: BR0802 FDOC

Package	NTX806AA01 ENHANCED CALL FORWARDING - POTS
Feature set	ENH. CALL FORWARDING
Feature	MULTIPLE SIMULTANEOUS CALL FORWARDING
Feature no	F2915

FEATURE SYNOPSIS

This feature is an enhancement to POTS call forwarding services which permit only one call to be forwarded at a time. It will provide better service to a subscriber who forwards to destinations, such as hunt groups, which can handle multiple calls.

FEATURE DESCRIPTION

The multiple simultaneous call forward (CFS) feature allows forwarding more than one call concurrently through a POTS station with any form of local POTS call forwarding active. The maximum number of multiple simultaneous calls is Telco defined on a per line basis and on the basis of the type of call forwarding (CFW-fixed or variable, CFBL, CFDA). CFS cannot be applied to CFW-USP.

Ref: LSSGR FSD 01-02-0801
AL0362 FDOC

Package	NTX807AA01 ENHANCED CALL WAITING - POTS(UPG. BY NTX807AB)
Feature set	STATION FEATURES
Feature	CANCEL CALL WAITING - POTS
Feature no	F2711

FEATURE SYNOPSIS

Cancel call waiting (CCW) is an addition to the call waiting (CWT) feature in DMS-100 POTS. It provides CWT subscribers with the ability to disable CWT feature for the duration of a telephone call. A global office parameter provides CCW feature for all customers subscribing to CWT feature (which is a line parameter).

FEATURE DESCRIPTION

Occasions arise when subscribers of the CWT feature would like to inhibit it for the duration of a call. This feature provides two methods of doing this: prior to originating the call and while the call is in talking state.

1. Prior to originating a call. To do this, the CWT subscriber will go off-hook, receive dial tone, and dial the CCW access code. After the access code is dialed, the subscriber will receive special dial tone which is a prompt for him to dial the number of the subscribers to whom he wishes to talk without CWT in effect. For the duration of this call, the CWT feature will be inhibited. When the call is disconnected, call waiting will be automatically restored to the CWT subscriber's line. If after the CWT subscriber dials the CCW access code and receives special dial tone, he fails to dial a complete directory number, the attempt to cancel CWT will fail.

2. Flashing while talking in a call. A subscriber disables CWT by first flashing the switchhook. On recognition of the switchhook flash, and if the CCW_ACTIVE office parameter is Y, the system will place the other party on hold and return special dial tone to the CWT subscriber. The subscriber then dials the CCW access code. On receiving the access code, the system will return confirmation tone to inform the subscriber that the request to disable the CWT feature has been honored. After returning confirmation tone, the system reestablishes the original connection between the subscriber and the other party. CWT is disabled for the duration of the call and automatically restored when the subscriber disconnects. If the feature requestor goes on hook during activation of the CCW feature he will be re-rung. The other party will remain on hold until the requestor goes back off hook or the other party itself also goes on hook.

Ref: FDOC BR0711
FSD 01-02-1204

NTX807AB01 Status: RTM ENHANCED CALL WAITING - POTS(UPG. OF NTX

STATION FEATURES	:	
CANCEL CALL WAITING - POTS		F2711
CALL WAITING FOR 3-WAY CALLING		F2810

Package	NTX807AB01 ENHANCED CALL WAITING - POTS(UPG. OF NTX807AA)
Feature set	STATION FEATURES
Feature	CANCEL CALL WAITING - POTS
Feature no	F2711

FEATURE SYNOPSIS

Cancel call waiting (CCW) is an addition to the call waiting (CWT) feature in DMS-100 POTS. It provides CWT subscribers with the ability to disable CWT feature for the duration of a telephone call. A global office parameter provides CCW feature for all customers subscribing to CWT feature (which is a line parameter).

FEATURE DESCRIPTION

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Ref: FDOC BR0711
FSD 01-02-1204

Package	NTX807AB01 ENHANCED CALL WAITING - POTS(UPG. OF NTX807AA)
Feature set	STATION FEATURES
Feature	CALL WAITING FOR 3-WAY CALLING
Feature no	F2810

FEATURE SYNOPSIS

This feature allows non-controlling parties in a three way call with the call waiting option to have incoming calls waited against them. Users of this feature are POTS and IBN stations using 500/2500 sets.

FEATURE DESCRIPTION

Currently only an EBS (p-phone) user with call waiting key can have incoming calls waited when involved in a three-way call (controlling and non-controlling). This feature allows a 500/2500 set user (POTS or IBN) with call waiting feature to be call waited when involved in a three-way call as a non-controller.

Ref: BR0810 FDOC

Package	NTX808AA01 ENHANCED 3-WAY CALLING - POTS
Feature set	STATION FEATURES
Feature	3-WAY CALL CHAINING
Feature no	F2800

FEATURE SYNOPSIS

This feature permits chaining of three way calls. A non-controlling party in an existing three way call can flash to add another party to the call. A subsequent flash will include the add-on party in a conference. The new controller, if he has sufficient privileges, can go onhook to transfer the call to the add-on party. This feature is applicable to both POTS and IBN, 500, 2500 and EBS. However, call transfer is blocked in POTS environment.

FEATURE DESCRIPTION

Three way call chaining allows a non-controlling party in a simple three way call or existing chain to flash and initiate another three way call provided he has either the 3WC line option or a call transfer option (IBN only) datafilled on his line or customer group. To flash, the non-controlling party must be in a held or talking state.

With 3WC chaining, the functionality of simple 3WC remains the same except that two new capabilities have been added per LSSGR, FSD 01-02-1301: controller ringback and conferencing of treatment.

The feature is applicable interactively i.e., both non-controlling parties can add on new parties, potentially creating a large chain of 3 way conferences. The maximum length of chain is determined by the number of three way conference circuits available in the office and the value of MAX_NO_OF_3_PORTS_IN_CHAIN datafilled in table OFCENG. The number of feature control blocks and feature data blocks will also be a limiting factor as one of each is required for each two port connection in the chain.

Ref: BR0800 FDOC

LSSGR FSD 01-02-1301

NTX812AA03 Status: RTM CENTRALIZED MAP

ADMINISTRATION	:	
DMS PASSTHROUGH MAP APPLICATION ENTITY		F5955
ADMINISTRATION AND MAINTENANCE	:	
CENTRALIZED MAP DMS ENHANCEMENTS		F6222
DYNAMIC ALLOCATION OF CENTRALIZED MAP SESSIONS		F6412

Package	NTX812AA03 CENTRALIZED MAP
Feature set	ADMINISTRATION
Feature	DMS PASSTHROUGH MAP APPLICATION ENTITY
Feature no	F5955

FEATURE SYNOPSIS

This feature provides an interface between the DMS communication channel to the DNC and a number of DMS subsystems which control MMI terminals. In terms of the OSI protocol model, this feature forms the application entity on the DMS side.

FEATURE DESCRIPTION

This feature along with F5956 constitute the DMS end of pass through DMS access (PTDA). With corresponding features at the DNC end a craftsperson at the DNC terminal has access to DMS CI session. DMS and DNC communicate via a NOP protocol on top of X.25. This allows data transfer using remote operations (RO). The corresponding DNC features are:

PTDE - Pass Through Display Emulator, and
PTRO - Pass Through Remote Operations

Ref: DDOC BC2126
CCITT Recs. X.409, X.410

Package	NTX812AA03 CENTRALIZED MAP
Feature set	ADMINISTRATION AND MAINTENANCE
Feature	CENTRALIZED MAP DMS ENHANCEMENTS
Feature no	F6222

FEATURE SYNOPSIS

This feature enhances the capabilities of centralized DMS MAP (CMAP) applications in DMS by providing two distinct sections:

- CMAP protocol improvement
- the implementation of the DMS I/O device concept for a CMAP session

FEATURE DESCRIPTION

The communication between Dynamic Network Controller (DNC) and the DMS is via network operations protocol (NOP). It allows data transfer using Remote Operations (RO). This feature implements two additional ROs for CMAP in DMS. CMAP protocol improvement is provided by a trigger mechanism originating from DMS and the other improvement allows CMAP session to be recognized as an I/O device to DMS when the communication link is established.

Ref: DDOC AG0097 DMS CMAP Enhancements

Package	NTX812AA03 CENTRALIZED MAP
Feature set	ADMINISTRATION AND MAINTENANCE
Feature	DYNAMIC ALLOCATION OF CENTRALIZED MAP SESSIONS
Feature no	F6412

FEATURE SYNOPSIS

The DNC craftsperson can register each Centralized MAP session to the DMS as an I/O device or a CI session. When a CMAP session is recognized as a DMS device several CI commands may be issued that access this device. (See FDOC AG0098 for examples.) Specifically, logs may be directed to this device. This feature ensures that after DMS warm or cold restarts or communication link failure each CMAP remote device that is autologged in, and had been specified as a log device, has its logs resume. Following a reload restart only the CMAP device with name 'CMAP' will have its logs resume upon re-connection. By using this device name, no manual intervention is necessary (once connected) to restore SCCS log operation through restarts.

FEATURE DESCRIPTION

This feature corrects the inconsistent communications between CMAP sessions and DMS log devices. Currently, once a CMAP session is registered as a DMS device with device name X and logs are routed to this device X, the following may occur:

- The DNC user disconnects device X and then reconnects it. Logs which had been routed to device X DO RESUME.
- The DNC user disconnects device X and connects device Y. Logs which had been routed to device X automatically RESUME on the screen of device Y.
- A DMS warm or cold restart occurs and the DNC autologin feature performs a login for device X; however, logs previously routed to device X DO NOT RESUME.
- A DMS reload restart occurs, and the devices datafilled in table LOGDEV have logs started to them. All other log devices that were previously active DO NOT RESUME, including CMAP devices which are not currently datafilled.
- There is a communication link failure and the DNC user exists CMAP during the autologin process. After the DMS-DNC links is re-established the user initiates a CMAP session as DMS device X and logs for device X DO RESUME.
- There is a communication link failure and the DNC user exits the CMAP during autologin. After the DMS-DNC links is re-established, the user initiates a CMAP session registered as DMS device Y and

logs, which had been routed to device X, DO RESUME on the screen of device Y.

This feature corrects the above anomalies, which are caused by the present organization of mapping between session number and device number. Namely, following a DMS warm or cold restart or communication link failure, logs will automatically resume to output only to the device to which they were previously directed. If the DNC user exits CMAP while autologin is being performed, or disconnects a DMS device registered by a CMAP session at any other time, then logs will not resume to the devices to which they were previously directed once these are reconnected. For reload restarts, a CMAP device name 'CMAP', has been reserved to be datafilled in the table. Thereby on every reload restart logs will start to this CMAP device once the DMS-DNC connection is re-established.

Ref: FDOC AG0375

NTX813AA01 Status: RTM CENTRALIZED ALARMS

ADMINISTRATION AND MTCE :
CENTRALIZED ALARMS

F6098

Package	NTX813AA01 CENTRALIZED ALARMS
Feature set	ADMINISTRATION AND MTCE
Feature	CENTRALIZED ALARMS
Feature no	F6098

FEATURE SYNOPSIS

This is one of several features which constitute the basic software package to implement Centralized Alarm Reporting (CALM) capability.

This DMS resident feature is responsible for acquisition of current alarm status information and transmitting them to Dynamic Network Controller (DNC) CALM for further downstream processing and screen image compilation.

FEATURE DESCRIPTION

CALM is one of many capabilities to centralize OAM activities for the Large Business Remote (LBR) switch network at a hosting DNC. It retrieves the current alarm conditions of all switches under its surveillance and distributes the alarm information to all login DNCs which update their respective screen images for the new information. A screen image provides integrated alarm status display of the LBR switch network in summarized formats at the DNC workstations, thereby allowing the user to take further analytic actions for the alarms of interest as required.

At the present time, this feature will not provide the user with capabilities to directly control its processing from DNC other than the routine login and logout sequences which start and stop its alarm monitoring process respectively. The user capabilities will be further enhanced in subsequent phases.

Ref: AG0100, AG0271

Package	NTX820AA01 ENHANCED 3-WAY CALLING - IBN
Feature set	STATION FEATURES
Feature	3-WAY CALL CHAINING
Feature no	F2800

FEATURE SYNOPSIS

This feature permits chaining of three way calls. A non-controlling party in an existing three way call can flash to add another party to the call. A subsequent flash will include the add-on party in a conference. The new controller, if he has sufficient privileges, can go onhook to transfer the call to the add-on party. This feature is applicable to both POTS and IBN, 500, 2500 and EBS. However, call transfer is blocked in POTS environment.

FEATURE DESCRIPTION

Three way call chaining allows a non-controlling party in a simple three way call or existing chain to flash and initiate another three way call provided he has either the 3WC line option or a call transfer option (IBN only) datafilled on his line or customer group. To flash, the non-controlling party must be in a held or talking state.

With 3WC chaining, the functionality of simple 3WC remains the same except that two new capabilities have been added per LSSGR, FSD 01-02-1301: controller ringback and conferencing of treatment.

The feature is applicable interactively i.e., both non-controlling parties can add on new parties, potentially creating a large chain of 3 way conferences. The maximum length of chain is determined by the number of three way conference circuits available in the office and the value of MAX_NO_OF_3_PORTS_IN_CHAIN datafilled in table OFCENG. The number of feature control blocks and feature data blocks will also be a limiting factor as one of each is required for each two port connection in the chain.

Ref: BR0800 FDOC

LSSGR FSD 01-02-1301

Package	NTX821AA01 TANDEM OPERATOR SERVICE ROUTING
Feature set	ACCESS TANDEM
Feature	LATA SCREENING ON 0+ CALLS
Feature no	F2882

FEATURE SYNOPSIS

This feature allows inter and intra LATA of traffic to be routed over separate trunk groups to different operator systems.

FEATURE DESCRIPTION

This feature adds an interlata conditional route selector which allows 0+ traffic arriving over incoming trunks to be routed over different trunk groups: intralata to operating telco (DTC) operator system and interlata to interlata carrier (IC) operator system.

Since the TOPS package (NTX187AA) already provides this functionality this feature applies to DMS-200 office without TOPS.

Lata screening depends on having both the calling number and called number. When calling number is not available (calls arriving over incoming IT trunks, ONI calls, ANI fail calls) the call is assumed to be intralata and routed to OTC operator system. All international calls are inter LATA.

Ref:

GFX386AA Access Tandem Switch
GFX187AA TOPS Equal Access
AL0168 FDOC

Package	NTX822AA01 EBS AS MESSAGE CENTRE
Feature set	IBN FEATURE
Feature	EBS AS A MESSAGE CENTER
Feature no	F2888

FEATURE: F2888

TITLE: EBS as a Message Center

FEATURE SYNOPSIS:

This feature provides the Electronic Business Set (EBS) with the ability to function as a message center. In this capacity, incoming trunk or internal calls are automatically routed to the EBS if they are not answered at the original destination. The EBS can activate or deactivate message waiting indications at user stations via a single key operation.

In order to function as a message center, an EBS should have a display and two special function keys with LCD's. The Message Waiting Indication (MWIDC) key is mandatory, while the Message Waiting Query key is desirable.

FEATURE DESCRIPTION:

This feature allows the EBS to perform the main functions of a message center which consist of:

- receiving and recording messages for forwarded calls
- conveying messages on request to called stations
- activating and deactivating message waiting indications for user stations.

The message center user may have either a 500/2500 set or a business set with message waiting capabilities.

Two types of calls can be presented to the message center, direct or indirect.

A direct call results when a station accesses the message center for message retrieval by one of the following means:

- dialing the DN (PDN in the case of MADN's) of the EBS message center.
- dialing the retrieval code.

An indirect call results when a call is forwarded to the message center because Call Forward Don't Answer (CFD), Call Forward Busy (CFB) or Call Forward All Calls was in effect.

When a direct or indirect call is presented to a message center operator and the operator depresses the PDN, the MWIDC LCD assumes one of the following states:

- On if the message waiting indication of the called station has not previously been activated.
- Flashing if the message waiting indication has previously been activated.
- Winking if the called station is not equipped with message waiting or if it is disabled.

For indirect calls, the operator records the caller's message and activates the message waiting indicator of the called station as appropriate.

For direct calls, the operator deactivates the message waiting indicator of the calling station as appropriate and conveys whatever messages exist for the caller. If the displayed DN differs from the DN specified by the caller, the operator uses the MWQRY key in conjunction with the MWIDC LCD to manually enter the DN and cancel the message waiting indicator of the caller's station.

REFERENCE: DDOC AL0206

Package	NTX824AA01 ENHANCED CALL WAITING - IBN(UPG. BY NTX824AB)
Feature set	SERVICES
Feature	IBN CANCEL CALL WAITING
Feature no	F6163

FEATURE SYNOPSIS

The cancel call waiting feature (CCW) allows a station user to prevent for the duration of a telephone call any incoming calls to 'call-wait' on his line. The incoming calls will be given instead of the destination - busy treatment. The CCW feature can operate from a 500/2500 station or an EBS station.

FEATURE DESCRIPTION

An IBN station user can activate CCW for the duration of a call. When the line has gone back to idle, CCW will be automatically deactivated. The station user can choose to activate CCW prior to placing the call, or after that the connection has been established. The station user activates CCW by dialling an access code. This access code is definable by Telco, separately for each customer group. CCW is intended to enhance the way call waiting operates. CCW is not a line option. It is an optional enhancement package which is available to Telco.

Also, operational measurements will be provided to Telco on the number of CCW activations and also on the number of destination - busy's due to CCW-in-effect at the destination line.

NTX824AB01 Status: RTM ENHANCED CALL WAITING - IBN(UPGR. OF NTX

STATION FEATURES	:	
CALL WAITING FOR 3-WAY CALLING	:	F2810
SERVICES	:	
IBN CANCEL CALL WAITING	:	F6163

Package	NTX824AB01 ENHANCED CALL WAITING - IBN(UPGR. OF NTX824AA)
Feature set	STATION FEATURES
Feature	CALL WAITING FOR 3-WAY CALLING
Feature no	F2810

FEATURE SYNOPSIS

This feature allows non-controlling parties in a three way call with the call waiting option to have incoming calls waited against them. Users of this feature are POTS and IBN stations using 500/2500 sets.

FEATURE DESCRIPTION

Currently only an EBS (p-phone) user with call waiting key can have incoming calls waited when involved in a three-way call (controlling and non-controlling). This feature allows a 500/2500 set user (POTS or IBN) with call waiting feature to be call waited when involved in a three-way call as a non-controller.

Ref: BR0810 FDOC

Package	NTX824AB01 ENHANCED CALL WAITING - IBN(UPGR. OF NTX824AA)
Feature set	SERVICES
Feature	IBN CANCEL CALL WAITING
Feature no	F6163

FEATURE SYNOPSIS

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Also, operational measurements will be provided to Telco on the number of CCW activations and also on the number of destination - busy's due to CCW-in-effect at the destination line.

NTX825AA02 Status: RTM EXCHANGE ALTERNATE BILLING SERVICE

SERVICE	:	
MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION		F1601
MCCS - CUSTOMER DIALED ON TOPS TRUNKS		F1602
SCREENING	:	
BILLED NUMBER SCREENING		F1603
MCCS	:	
LIMIT TO NUMBER OF SEQUENCE CALLS		F2680
RATING AND CHARGING	:	
EXCHANGE ALTERNATE BILLING SERVICE		F2906
SERVICE	:	
MCCS - CUSTOMER DIALED ON LINES		F3390
MCCS - CUSTOMER DIALED SEQUENCE CALLS		F3391
MCCS - OPERATOR ASSISTED CCV		F3395
ADMINISTRATION	:	
ACCS ENHANCEMENTS		F6416
TOPS AMA	:	
AUTOMATIC CALL GAPPING		F7062

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	SERVICE
Feature	MCCS - OPERATOR ASSISTED MANUAL INWARD VALIDATION
Feature no	F1601

FEATURE DESCRIPTION

This feature allows a TOPS office to act as a host for manual inward validation of credit card numbers for operators in offices not equipped for CCIS/DS type verification. The term "manual" means that the number must be given verbally by the distant operator to the TOPS operator, who then enters it at the TOPS position for validation. This feature does not include the automatic form by which the number is keyed at the distant office without involving an operator in the TOPS switch.

Calls are originated in the distant office by seizing a trunk and outpulsing 1160 to the TOPS office.

Translations must be arranged in the TOPS office to use table TOPS routing to bring the call to a TOPS position, as with other inwards calls (such as 121 & 115x). A new call origination, 1160, is being provided to handle this feature.

When the call reaches a TOPS position, the TOPS operator will request the 14 digit credit card number from the distant operator.

The TOPS operator will key the number at the position, using the kp spl key, which will cause a CCIS/DS query to the BVC database.

While waiting for the reply, the 14 digit number will be displayed with the 4 PIN digits replaced by the letters 'XXXX' for security. The number will be followed by the letters 'VFY'.

When the reply is received from the BVC, the letters 'VFY' will be erased, and the display updated as follows: 1) Number invalid - flash full 14 digit display (including PIN as keyed) to allow full verification and reentry.

2) RAO known, PIN unrestricted - display RAO digits in place of 'VFY'

3) RAO known, PIN restricted - display RAO digits followed by the letter 'R'.

4) RAO unknown - no display beyond the 14 digit number.

The operator will then pass the reply on verbally to the distant operator.

If the number is invalid, the distant operator can check with the subscriber and give another number for the TOPS operator to check as above.

When the operators have finished, the TOPS operator releases the call, and becomes available for further traffic. The trunk is also idled normally when the distant operator releases it.

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	SERVICE
Feature	MCCS - CUSTOMER DIALED ON TOPS TRUNKS
Feature no	F1602

FEATURE DESCRIPTION

INTRODUCTION

In an attempt to reduce operator involvement in credit card type calls and to reduce the incidence of fraud for both credit card and special billing type calls, a new set of features referred to as Mechanized Calling Card Service (MCCS) is being developed. This document will describe the workings of customer dialed calling card validation of MCCS. This feature will allow customers to enter their calling card numbers and complete their calls without access to an operator on automatically identified 0+ and 01+ (international) calls.

BACKGROUND

The present credit card format is 14 digits comprised of a 10 digit billing number in the form of:

1. NPA+NXX+XXXX
2. RAO+0/1 XX-XXXX

plus a 4 digit number consisting of a 3 digit RAO code and a single check digit. It is possible, using a check digit algorithm, to determine the validity of a RAOD type credit card.

The AT&T Co. has introduced calling cards with a very similar format except that the RAOD digits are replaced with a Personal Identification Number (PIN). A PIN is a 4 digit code where the first digit may not be a 1 or 0 but the remaining three digits may have any value from 0-9.

A PIN may be designated by the subscriber to be either a restricted or an unrestricted PIN. A restricted PIN will permit only station to station calls to the billing number (collect only service). An unrestricted PIN is valid for calls to all destinations and may be used for station or person billing.

Any DTMF telephone is capable of being used by a customer to key in a calling card number. If MCCS is available, the number will be forwarded to a Billing Validation Centre (BVC) for verification. For subscriber dialled calling card calls, no operator intervention is required. An announcement system is provided which provides verbal instructions and prompts to the subscriber. A list of announcements is provided at the end of this section.

The billing validation data base is maintained in several distributed BVC's which are accessed via CCIS/DS, the Direct Signalling feature of the CCIS network. All data for a given RAO or NPA-XXX resides in a single BVC, allowing a routing of queries by the number being queried. Routing data is maintained by AT&T Long Lines; the BVC's are associated with the Originating Toll Centres; and the data is provided by telco's.

A BVC query is expected to have an average response time approaching 1 second with a maximum of 2 seconds. Queries can be lost due to CCIS network failure or congestion, or due to failure or congestion in an individual BVC. (Provision is made in reply messages to indicate congestion, which should cause a fraction of the MCCS queries to be discarded.) CCIS links must be suitably provisioned as described in AT&T TA62.

ORIGINATING STATION TREATMENT

The first step in customer dialed calling card validation is to apply Originating Station Treatment(OST). This is done immediately after a customer has picked up his handset and dialed 0+ or 01+. This is necessary because the feature is accessible from all lines. There are three types of originating station treatments:

1. no customer dialed MCCS service (which means that a subscriber would route to an operator)
2. alerting tone;
3. alerting tone plus prompt announcement.

Customers at phones without MCCS service such as rotary dial phones would receive treatment 1. Subscribers at phones with MCCS service and where the caller would be expected to be familiar with the service such as a DTMF phone located in a residence would receive treatment 2. Customers at phones with MCCS service and where the caller could be unfamiliar with MCCS such as a public DTMF phone would receive treatment 3.

In order to determine the type of OST to apply to a call, a new optional table, MCCSOST, will be created. This table should contain one tuple for each incoming and two way TOPS trunk group in an office. Each tuple will be composed of two parts. One part will apply to the calls which originated on public phones and the other part will apply to calls that originated on nonpublic phones. In each part, one of three statuses should be specified: no service, calling card service, or BVC lookup. If the value is no service, then OST 1 will be applied. If the value is calling card service, then the telco must specify that either OST 2 or OST 3 is to be applied. If the value is BVC lookup, then the telco must specify the default action to take when the BVC lookup cannot be done (either OST 1, 2, or 3). The BVC lookup will either return a result which corresponds to one of the three originating station treatments or it will fail and the failure OST specified by the telco will be applied. If a call originates in an MCCS office on a TOPS trunk group which does not have an entry in table MCCSOST, then OST 1 will be applied.

It should be noted that a trunk group can only have a status of no service or MCCA service if all calls which originated on public phones or all calls which originated on private phones on that trunk group can be given the same OST. Otherwise, it must have a status of BVC lookup. Also note that each trunk group has two statuses and they are independent. For example, the calls which originate on public phones on a trunk group could have a status of MCCA service, while the calls which originate on private phones on the same trunk group could have a status of BVC lookup.

REACHING AN OPERATOR

After OST 2 or 3 has been applied, the customer may decide that he wants an operator. If so, there are three options. He may wait 5 seconds for a timeout, he may flash the switchhook, or he may key '0#' to cause an operator to be attached. If the customer does not seize this moment to route to an operator and begins to key his calling card number, he can no longer reach an operator without hanging up.

ENTERING THE CALLING CARD NUMBER

If the subscriber does not want an operator, he keys in his 14 digit calling card number or his 4 digit PIN if the billing number is the same as the called number. A format check is then applied to the number. If the customer keyed 14 digits, then the number must be in one of the formats listed in the Background section of this document along with a 4 digit PIN. Also, even though 800 is a valid NPA, it is not valid when used in a calling card. If the subscriber entered a 4 digit PIN the first digit cannot be 0 or 1. Also, the called number may not be INWATS, directory assistance or overseas. If the number passes the format check, then a BVC inquiry is made via the CCIS network. If the calling card number is valid then the number is outpulsed and the 'thank you' announcement is returned to the caller. If the BVC inquiry is unsuccessful, announcement #2 is returned to the caller which requests that the calling card number be reentered. If no dialing occurs within 3 seconds (T4-see the list of timeouts at the end of this section), the MCCA alerting tone is given. The customer then has 3 seconds (T5) to start dialing before being prompted by announcement #3. After this announcement, the customer has 5 seconds (T6) to dial. If no digit is dialed in this interval, the customer is given announcement #9 and the call is ended. If the customer enters a second calling card number and if this number again fails to pass the checks, then announcement #4 is played and the call is terminated. If the second attempt is successful, the number is outpulsed and the 'thank you' announcement is sent to the caller.

TIMEOUTS

Timeouts are defined following those in AT&T Technical Advisory #62. A table of timeouts is presented at the end of this document. A basic

interdigit timeout of 5 seconds (T9) applies to MCCS calls. Longer timeouts are used after natural breaks in a keying sequence such as after entering an NPA.

After a customer dials 0+, OST is applied. If the OST is tone only, then the customer has 5 seconds (T9) in which to begin dialling the calling card number or to take action to attach an operator. If the OST is tone plus prompt announcement, the subscriber has 1 second (T2) to begin action. If no action is begun, announcement #1 will be played. The customer is then given an additional 5 seconds (T3), to start dialling or take action to get an operator. If the customer has done nothing by the end of this time, an operator is attached to the call.

If a customer dials 4 digits after OST, interfield timing of 2 seconds (T12) is done. If no digits are dialed in this interval, a tentative assumption is made that this is a PIN and a validation is performed. While this is occurring, the customer has 3 more seconds in which to enter more digits. If no more are entered, the action indicated by the PIN validation is executed.

A complete definition of interdigit timing is provided at the end of this section.

ERROR CONDITIONS

Several different error conditions can occur during an MCCS keying sequence. A timeout as described above, can occur after a customer has begun dialling a calling card number. The '#' could be used incorrectly. This is an optional end of digit indicator. However, the customer could miss one of the digits in the calling card number and generate an error condition by striking the '#'. Also, if the subscriber keyed '#' immediately after OST had been applied (thereby indicating a calling card number of 0 digits), an error condition would be generated. An invalid character, such as an '3' could be entered which would cause an error condition to arise. Since these errors are equivalent to invalid calling card numbers, they are treated in the same manner. If this is the first attempt, then announcement #2 is played and the subscriber is given a second chance to enter the calling card number. If this is the second attempt, announcement #4 is played and the call is terminated.

DISCONNECTS AND FLASHES

As usual, disconnects will cause a call to be terminated. Also, flashes will normally be ignored. There are two exceptions to this. After OST has been applied, if the subscriber flashes, or if the subscriber pulses 0 and then flashes, the call will be brought to an operator.

UNEXPECTED DIGITS

Digits that arrive during a prompt announcement or tone will usually be ignored. However, there are four exceptions. If the digits arrive during announcements #1, #2 or #3 or during the OST tone, they will be processed normally and the announcement/tone will be stopped.

DTMF PAD ENABLEMENT

In order that MCCS can work, DTMF lines in local offices must be engineered so that DTMF pads are enabled on 0+ calls. In particular, the local office must be in a coin retention mode when processing coin first coin phones since it is necessary that the initial deposit be in the hopper in order to enable the DTMF pads on these types of phones. When coin retention mode is in effect, the coins will be returned on calling customer disconnect.

ANNOUNCEMENTS

The following is a list of announcements that will be provided with MCCS. They are taken from AT&T Technical Advisory #62. Only the subset of announcements which pertain to customer dialed calling card validation is listed here.

Announcement #1: Prompt announcement on a customer-dialed CC call using the tone plus prompt announcement OST.

"Please dial your card number or zero for an operator now".

Announcement #2: A customer dialing error has occurred on a customer-dialed CC call.

"Please dial your card number again now. (Pause) The card number you have dialed is not valid."

Announcement #3: Prompt announcement after an error has occurred and the alerting tone has been given.

"Please dial your card number".

Announcement #4: An invalid CC number was entered and the error threshold has been reached; the customer must hang up and reoriginate the call.

"Please hang up and dial zero plus the number you are calling. (Pause) The card number you have dialed is not valid."

Announcement #9: Termination announcement after error threshold has been reached, without another number being entered.

"Please hand up and dial zero plus the number you are calling."

Announcement #16: The following announcement is applicable whenever the subscriber has entered the card number correctly.

"Thank you."

Announcement #17: Alert tone prompt for calling card dialing. This is a complex tone consisting of 60 ms dtmf #-tone (941/1477hz * -10dbm) followed immediately by 940 ms of exponentially decayed dial tone (440/350 hz with time constant of 200ms initially at -10dbm)

The announcements will be produced by Digital Recorded Announcement Machine (DRAM). These will be switched into the call when required and remain with the call until a valid calling card number is received or the call is terminated. It will not be possible to utilize a conventional announcement machine for this feature.

HARDWARE ERRORS OR FAILURES

The actions taken on hardware errors or failures will depend on the type and severity of the errors. Service will be maintained as long as is possible. For example, if a DRAM fails before the 'thank you' message has been played but after the calling card digits have been collected, then the call will continue. However, if no DRAM's are available immediately after a subscriber dials 0+, the call will be routed to an operator.

ORIGINATION RESTRICTIONS

0+ calls from hotels which require nocharge messages will route to an operator in order to obtain the calling customer's room number.

MCCS is only defined for coin calls which arrive on trunks with multiwink or extended inband coin signalling. Calls which arrive on other circuits will timeout and route to an operator if the keypad is disabled by the end office when routing to an operator. Trunks from these offices should be datafilled for no service in table MCCSOST.

In BCS14, calls which originate from lines in 100/200 offices must be routed to TOPS via loop around trunks in order to receive MCCS service. This can be done by appropriately modifying the pretranslator pointed at by the entry for the line in table LINEATTR. It must point to an entry in

table POSITION which routes directly to a looparound trunk, not to TOPSPOS.

TIMING PARAMETERS

- T1 = Initial timing after MCCS for tone-only treatment (5 seconds).
- T2 = Initial timing after MCCS tone for tone-plus-prompt treatment (1 second)
- T3 = Timing after prompt announcement (5 seconds).
- T4 = Timing after error announcement (3 seconds).
- T5 = Timing after tone in error sequence (3 seconds).
- T6 = Timing after prompt in error sequence (5 seconds).
- T7 = Sequence call timing parameter.
- T8 = Sequence call timing parameter.
- T9 = Total timing after 4th digit (5 seconds).
- T10 = Interfield timing on all calls (6 seconds).
- T11 = not used.
- T12 = Timing after fourth digit on MCCS call to distinguish PIN only (2 seconds).
- T13 = Interdigit timing on all calls (7 seconds).
- T14 = Sequence call timing parameter.
- T15 = Sequence call timing parameter.

INTERDIGIT TIMING
CUSTOMER DIALLED MCCS CALL

PIN ONLY	N	Y	Y	Y (#)										
MCCS NUMBER	N	P	A	N	X	X	X	X	X	X	N	Y	Y	Y (#)
MCCS NUMBER	R	A	O	0/1	X	X	X	X	X	X	N	Y	Y	Y (#)
INTERDIGIT TIMING														
	T9	T9			T9		T9	T9	T9		T13	T13	T13	
INTERFIELD TIMING			T10			T9								
AFTER 1ST 4 DIGITS				T9										
AFTER 1ST 10 DIGITS										T13				

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	SCREENING
Feature	BILLED NUMBER SCREENING
Feature no	F1603

FEATURE SYNOPSIS

Billed Number Screening (BNS) is a feature used to curb attempts to fraudulently bill calls to collect or third numbers. CCIS-DS is used to pass queries from the DMS-TOPS office to a centralized database where the number quoted by the subscriber is screened against a file of numbers marked as restricted stored in the database. This feature is particularly useful to prevent charging to public telephone directory numbers

FEATURE DESCRIPTION

The Billed Number Screening (BNS) feature allows a customer to designate that collect and/or third-number billing will not be accepted at a specified line number. Any calling party, using TOPS and attempting to bill a collect or third-number call to that number, will have the call denied before it advances beyond the TOPS. BNS also includes a Public Telephone Check (PTC) feature which allows telephone companies to prevent collect or third-number billing to their public telephones. BNS should help reduce the amount of fraud in billing to public telephones or nonworking numbers.

BNS will be applied to all conventional collect or third-number calls placed through a TOPS operator. The feature will allow numbers to be designated one of the following billing restrictions: collect denied, third-number denied, and public telephone check.

Any attempt by an operator to key a number as collect or third-number billing will cause a BNS (if available) query of a billing validation database, to see if any billing restrictions exist. The billing validation databases are located at several distributed BVC's (billing validation centres) which are accessed via CCIS/DS, the direct signalling feature of the CCIS network. All the BNS information is grouped along with the MCCS (mechanized calling card service) information, according to their NPA-NXX and it is up to the individual telco's to administer their own data. Total turnaround time of a database query should be less than 2 seconds. These databases return a code to indicate whether or not the query was successful as well as an explanation of what went wrong.

While the query is taking place AMA VFY will appear at the position to inform the operator that a verification is in progress and it will disappear as soon as the response is received. During the query the ST TMG and CA TMG keys will have no effect, along with KP FWD, KP BACK, all the class charge keys and KP SPL. Once the database query is completed, the operator will be informed if the type of billing requested has been denied or if the billing number is that of a public telephone or nonworking number.

This will be indicated at the operator position. The following table shows the possible results of the database query and the displays that will appear on the operators position.

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	MCCS
Feature	LIMIT TO NUMBER OF SEQUENCE CALLS
Feature no	F2680

FEATURE SYNOPSIS

This feature provides the capability for the Telco to limit the number of sequence calls that can be made from a single billing validation centre query - in the case of MCCS calls.

FEATURE DESCRIPTION

The implementation of this limiting feature is by providing an office wide parameter to the Telco MCCS-SEQ-CALL-LIM. The Telco can decide what is the maximum number of allowed sequence calls on a single validation query and fill the table with values in the range of 0-127 with default at 127.

To prevent sequence calls, the datafill is zero. At the end of each call, the calling subscriber keys in the octothorpe (#) to continue with another call and once the limit is reached, he is routed to a treatment - announcement #9.

This feature needs F1602 and F3391.

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	RATING AND CHARGING
Feature	EXCHANGE ALTERNATE BILLING SERVICE
Feature no	F2906

FEATURE SYNOPSIS

This feature provides Automated Calling Card Service (ACCS) software capability to query a Line Information Database (LIDB) via the Signalling System #7 (SS7) network using Transaction Capability Application Part (TCAP). ACCS provides capabilities similar to Mechanized Calling Card Service (MCCS), i.e., calling card validation (CCV) queries and billed number screening (BNS) queries, but provide additional line information as well. A database simulator is provided via a local application.

FEATURE DESCRIPTION

The feature functionally performs calling card verification and billed number screening services. However, within these basic services are separate definitions of what makes up each. They include:

- Calling card service - a billing option that allows the customer to charge calls to a 10 digit account number, which is either a line or special billing number called a calling card account number.
- Call completion service - the operator services system completes intraLATA calls between calling and called parties. This service is not changed by this feature.
- Person service - provided by an operator, at the customer's request, to verify that a particular person, extension, department, etc, is the recipient of the call. This service is not changed by this feature.
- Collect service - a billing option in which the called party agrees to pay for a completed call.
- Third number billing - a billing option that allows the customer to charge calls to a number other than the calling or called number.

Ref: AL0285

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	SERVICE
Feature	MCCS - CUSTOMER DIALED ON LINES
Feature no	F3390

FEATURE SYNOPSIS

This feature allows MCCS services from lines to be supported in a DMS-100/200/TOPS environment without the need for loop around trunks. Originating station treatment is determined from the DTMF class of service indicator in the Line Attribute Table.

FEATURE DESCRIPTION

Currently calls which originate on lines in a 100/200/TOPS office route to MCCS via loop around trunks. This feature will allow 1FR ani lines without options, coin lines, 1FR hotel lines and PBX hotel lines to route directly to MCCS.

Lines will only be a candidate for MCCS service if they have DTMF service. If a line has DTMF service, then Originating Station Treatment (OST) must be applied. The OST applied to a line will determine if a line receives MCCS service and if so, whether a tone or tone and announcement is played to prompt the calling subscriber. In order to determine the type of OST to apply to a line, lines will be associated with TOPS trunk group CLLI names. This will be done by associating the entry in the ZEROMPOS field of table LINEATR with a CLLI in table TOPLNDIS. This CLLI name will be used to index table MCCSOST which contains the OST information.

Since CCF coin phones require that the initial deposit be retained in order to have their DTMF keypads enabled, offices which use this feature must be in a coin retention mode. The initial deposit will be returned upon calling customer disconnect.

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	SERVICE
Feature	MCCS - CUSTOMER DIALED SEQUENCE CALLS
Feature no	F3391

FEATURE SYNOPSIS

This feature allows MCCS subscribers who have successfully entered their calling card numbers to make additional calls without re-entering their calling card number. The "#" sign is used to signal to the DMS-TOPS office that the subscriber has requested a sequence call. This feature is an extension of the feature MCCS- Customer dialled on TOPS trunks (F1602). A partial list of announcement used for sequence call is provided at the end of the Feature Description.

FEATURE DESCRIPTION

a) Basic Call Flow

When a MCCS call which was made with a calling card with an unrestricted pin (or a pin whose status is unknown) is completed, the calling subscriber waits for the called customer to go on hook. Once this has occurred, the customer keys an '#' followed by a valid dialing sequence (valid dialing sequences are described below). Then a 'thank you' message is played to the subscriber. If the called number can be successfully translated, then the calling customer is connected to the desired party. Otherwise, he is connected to a standard tone or announcement.

After the calling subscriber keys an '#', he has two seconds, to begin keying the called number. If he does not begin keying in this time, he will be prompted by announcement #5. After announcement #5 has been played, he then has 10 seconds to begin entering the called number. If he does not do so, then announcement #5 will be played again. He then has 10 additional seconds to key in the called number. If he does not do so, then announcement #9 is played and the call is terminated.

If a calling subscriber does not receive answer from a successfully dialed MCCS call, he can terminate that call and begin a MCCS sequence call by striking the '#'. Note that this applies to all calls in the sequence including the first call.

There is no limit to the number of sequence calls that a subscriber can make.

b) Valid Dialing Sequence

A valid dialing sequence is one of the following:

1. International sequence call: 01 + country code + national number followed by an optional '#'.
2. Other sequence calls: (optional 0+) 7 or 10 digit called number followed by an optional '#'

ie. either
NXX XXXX (#) - 7 digit number,
or
NPA NXX XXXX (#) - 10 digit number.

c) Partial List of Announcement

1. Announcement #5: Prompt announcement on a customer-dialled MCCS sequence call "you may dial another call now".
2. Announcement #9: Termination announcement after error threshold has been reached without another number being entered. "Plase hang up and dial zero plus the number you are calling".

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	SERVICE
Feature	MCCS - OPERATOR ASSISTED CCV
Feature no	F3395

FEATURE DESCRIPTION

Operator-Assisted Calling Card Service

Operator-assisted calling card service is part of the Mechanized Calling Card Service (MCCS) feature. MCCS normally provides a subscriber with the ability to dial billing information without the assistance of an operator, as follows: The subscriber places the call from a telephone capable of DTMF signalling by first dialing zero plus a seven-digit or ten-digit called number ('0+' call). Then, in response to an alert tone or announcement, a personalized fourteen-digit calling card number is dialed. If all goes well, the call is automatically connected and billed to the calling card.

There are cases, however, where calling card billing still requires the assistance of an operator.

- (1) The originating station is not equipped for DTMF signalling.
- (2) The toll billing office is not equipped for automated calling card digit reception.
- (3) The local office is not equipped for Automatic Number Identification (ANI).
- (4) ANI failure occurs at either the local or toll office.
- (5) Announcement circuits or DTMF receivers are all busy.
- (6) Subscribers elect not to dial the calling card themselves, or don't know how to do so, or perhaps require operator assistance for some other reason such as a person call.
- (7) Other kinds of calls (not '0+') reach an operator and calling card billing is requested, such as '0-' or '1+ coin' or '1+ hotel'.

Operator-assisted calling card service is available for these subscribers. This feature supports the MCCS method of calling card validation, which is by a direct signalling (CCIS) query to the Billing Validation Centre (BVC) data base. This query is sent when the operator enters the calling card on behalf of the subscriber. It takes approximately one second for the BVC to reply, at which time the status of the calling card is displayed to the operator.

Reaching the Operator

The prompt tones and announcements which request the subscriber to dial his calling card on '0+' calls, and the receivers which collect the DTMF digits, are provided by the toll switching office to which the call has been routed. On a trunk group basis the toll switch can determine whether the originating station has MCCS service. Alternatively, a direct signalling query to a centralized Billing Validation Centre (BVC), based on the calling number already identified by ANI signalling, can determine MCCS capability. Where no MCCS service is indicated, the subscriber is routed directly to an operator in the same manner as prior to the MCCS feature application.

Where MCCS service is provided, the subscriber receives the prompt tone or announcement when the toll office is ready to receive the calling card DTMF digits. At this point, a subscriber electing not to dial the calling card may reach an operator by one of three methods:

- (1) Do nothing. (A timeout occurs.)
- (2) Dial zero (DTMF only).
- (3) Flash the switch-hook.

In all three cases, the automatic calling card reception is terminated and an operator is attached. NOTE. Once the subscriber begins to dial in the calling card, operator access is thereafter available only by hanging up and re-originating the call.

The previous paragraphs describe how a '0+' origination can reach an operator. Understand, however, that '0-' or '1+' originations can also reach an operator in the usual way. This feature encompasses all types of originations for which either the calling party or the called party request calling card billing.

Operator Handling

Once the subscriber has reached an operator, he then quotes the appropriate calling card number to the operator, who keys in the information. The proper charge class for calling party billing to a calling card is 'station special calling' or 'person special calling'. For collect calls billed to a calling card, the charge class is 'station special called' or 'person special called'. (NOTE. A charge class restriction is described in the section entitled 'Restricted PIN'.) The call progresses much in the same manner as any other operator-handled call requiring special billing, except for the method of calling card validation.

Note that the operator may be called upon to provide any of the standard services available to subscribers. For example, collect or person-to-

person call handling, a change to third number billing, or a new called number. Once the billing information is accepted by the system, the call is automatically outpulsed and the operator may float the call.

Calling Card Validation

The calling card number is a fourteen-digit number consisting of a ten-digit billing number plus a four-digit Personal Identification Number (PIN).

The billing number is usually the directory number to which the call is to be billed, of the form 'NPA-NXX-XXXX' but may also be a special (non-directory) billing number of the form 'RAO-(0/1)XX-XXXX', where RAO is the Revenue Accounting Office which has assigned the billing number. These two forms of billing numbers are distinguished by examining the fourth digit.

The PIN is of the form 'NYYY' where 'N' is neither digit '0' nor digit '1'.

If the calling card number keyed by the operator does not conform to the formats specified above, the card is immediately rejected. Otherwise, it is validated by automatically performing a direct signalling query to the Billing Validation Centre (BVC). The reply from the BVC indicates if the calling card is acceptable. In all cases, the validation status is displayed on the operator's screen. If the billing is not accepted, a calling card number may be re-entered by the operator for validation and display. The call is not allowed to complete until an acceptable calling card number is entered, or an alternate billing class is entered.

Restricted PIN

There are two types of PIN which may be associated with a directory billing number. An 'unrestricted' PIN is valid for calls to all destinations and for station or person calls. A 'restricted' PIN, however, is valid only for station calls to the billing number (collect only service). In the latter case the subscriber needs only to quote the four-digit PIN to the operator, rather than the full fourteen-digit card number, as the billed number and the called number are the same.

If the operator keys only a four-digit calling card, it is assumed to be a PIN and the calling card is constructed from the ten-digit called number and the four-digit PIN. It follows that if the called number is an operator code or an overseas, INWATS or Directory Assistance number then the PIN is immediately rejected. It also follows that if the called number is

absent, as could be the case when a '0-' origination requires calling card billing, then calling card validation must be delayed until the called number is entered.

Irregardless of whether the operator keys a four-digit or a fourteen-digit calling card, the reply to a Billing Validation Centre query may indicate that the calling card is restricted. In all such cases, person calls are not allowed, and if the billing number does not match the called number the calling card is rejected.

Special Number Displays

Calling cards are displayed in the special number field on the TOPS console in the format '999-999-9999-XXXX' where 9's are digits and the PIN is masked with X's for security. The following displays are possible. Angle brackets are not displayed but mean that the enclosed characters are displayed in flashing mode.

SPL #	The subscriber could have dialed a calling card but chose not to. Displayed on call arrival, this informs the operator to encourage the subscriber to dial the calling card directly.
SPL # XXXX	A four-digit PIN has been keyed by the operator and displayed when the CLD number is absent. The full calling card number will be displayed when the CLD number is keyed.
SPL #<XXXX>	The four-digit PIN and the called number are not compatible. May be displayed when the operator keys either number.
SPL # 999-999-9999-XXXX VFY	A fourteen-digit calling card number has been keyed or a four-digit PIN has been keyed when a domestic called number is present. Validation (VeriFY) is in progress.
SPL # 999-999-9999-XXXX	The calling card could not be validated because of data base access problems. It is assumed to be valid and unrestricted. The Revenue Accounting Office (RAO) is unknown.

SPL # 999-999-9999-XXXX 999 The calling card number is valid and unrestricted. The RAO is displayed in the last 3 digit positions.

SPL # 999-999-9999-XXXX 999 R The calling card is valid and restricted. The RAO is displayed in the last 3 digit positions.

SPL #<999-999-9999-9999> The calling card number is not valid. Note that the PIN is not masked.

SPL #<999-999-9999-XXXX 999 R> The restricted calling card is not valid because it does not match the called number. May be displayed when the operator keys either number.

AMA Record Modifications

For billing purposes, it is necessary to record the following information regarding MCCS calling card validation:

- (1) the Revenue Accounting Office (RAO) returned from the Billing Validation Centre,
- (2) whether the calling card was customer-dialed or operator-assisted, and
- (3) whether or not the Billing Validation Centre was successfully accessed.

Because there is no need to record the four-digit PIN portion of the calling card (in fact, it should be deleted for security reasons), it can be conveniently replaced by the three-digit RAO followed by an information digit to be interpreted as follows:

- 0: BVC validated, customer-dialed
- 1: BVC validated, operator-assisted
- 2: BVC failure, customer-dialed
- 3: BVC failure, operator-assisted

'BVC validated' means that the calling card has been successfully validated by a Direct Signalling query to the Billing Validation Centre, and a valid RAO is present. Otherwise, 'BVC failure' is implied and the RAO has value '000'.

This method of recording the calling card validation information requires no format changes to the existing E0 AMA entry, which is where special billing numbers are recorded. What changes is the interpretation of the last four digits of the fourteen-digit special number when the special

number is a domestic credit card and the billing office is equipped for MCCS.

Note that these AMA modifications apply as well to customer-dialed MCCS calls - feature V1114.

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	ADMINISTRATION
Feature	ACCS ENHANCEMENTS
Feature no	F6416

FEATURE SYNOPSIS

Provide Exchange Alternate Billing Service(EABS) with three Common Channel Signalling System 7(CCS7) enhancements. First, a Regional Accounting Office(RAO) indicator is included in the query result formats from the Line Information Database(LIDB). Second, optional parameters in the query result formats is handled. Lastly, the decode of Automatic Call Gapping(ACG) results is handled, although the actual implementation of ACG will not be done.

FEATURE DESCRIPTION

The purpose of this feature is to provide enhancements for BCS24 to Exchange Alternate Billing Services (EABS). EABS is described in GFX825AA01 of the DMS-100 Family Package. The enhancements include providing three additional capabilities to the feature. They include handling 3 items to be returned from the Line Information Database (LIDB) that were not handled before. These items include the addition of a 3-digit Revenue Accounting Office (RAO) code for Automatic Message Accounting (AMA) purposes, the addition of Spare and Telco Spare indicators (which are optional parameters which may or may not be included in a LIDB response), and the ability to perform the decode of an Automatic Call Gapping (ACG) response from the LIDB.

Ref: AF0737

Package	NTX825AA02 EXCHANGE ALTERNATE BILLING SERVICE
Feature set	TOPS AMA
Feature	AUTOMATIC CALL GAPPING
Feature no	F7062

FEATURE SYNOPSIS

This feature provides Automatic Call Gapping (ACG) to Automated Calling Card Service (ACCS). Automatic Call Gapping controls queries to a Service Control Point (SCP) during overload conditions. The mechanism from instructing the source to reduce its traffic is the ACG message. The ACG message specifies the rate at which the queries for a given code (NPA-NXX) should be sent to an SCP. The rate is given in terms of the gap interval, which is the time between successive releases of the queries from the source to the SCP.

FEATURE DESCRIPTION

The number of queries sent to SCP may be reduced at the request of the SCP. The request from the SCP comes in the form of an Automatic Call Gapping (ACG) message. The request for ACG can only be sent as part of a response to a Calling Card Validation or Billed Number Screening query.

The ACG message contains the NPA-NXX for which control is requested, the duration of the control and the control gap interval.

Once ACG control is initiated, a minimum length of time is maintained between calls from the NPA-NXX that are allowed to make a database query. This length of time is called the gap interval. The gap interval begins when the ACG message is received from the SCP. Subsequent queries for the same NPA-NXX are blocked until the gap interval has expired. The gap interval is reset on the first call allowed to launch a query. The gap interval is continually reset until the duration expires.

Ref: FDOC AF1251

Package	NTX827AA02 NEW PERIPHERALS PERFORMANCE MEASUREMENTS
Feature set	MAINTENANCE
Feature	XPM REALTIME AND PERFORMANCE TOOLS
Feature no	F6168

FEATURE SYNOPSIS

The intent of this feature is to provide information on performance and activity of individual peripherals.

FEATURE DESCRIPTION

The information on the peripheral's performance will be provided via a newly created MAP level which will be available from the present PM level. The new MAP level will have 2 sublevels; PMAct and Delays.

PM ACTIVITY (PMACT): This sublevel will contain information indicating real time available in the SP and the MP within the peripheral. The real time being used will be divided into three categories - call processing occupancy, high priority background occupancy and the low priority background. The combination of the first two occupancies will provide service information while the third one for audits and diagnostics.

In addition, UTR and p-side channel usage information will be available indicating peak, average usage and availability of channels. The data provided is the last minute and the average for the last 15 minutes.

DELAYS: This sublevel will provide information on call processing delays i.e., dialtone delay, dialtone removal delay, post dialing delay, answer, speech path and PCM cut through.

The data for each component of delay will be divided into:

- i) Average delay
- ii) 50 percentile delay
- iii) 95 percentile delay

The delay values will represent the previous 15 minutes. The screen is updated every minute.

Ref: FDOC AC0024

Package	NTX827AA02 NEW PERIPHERALS PERFORMANCE MEASUREMENTS
Feature set	MAINTENANCE
Feature	XPM PERFORM TOOL ROBUSTNESS
Feature no	F6444

FEATURE SYNOPSIS

This feature extends the usefulness and robustness of feature AC0024: XPM real time and performance tools.

The existing tool will be split into a performance tool base layer and an application layer. Currently only the Line Trunk Controller (LTC), Line Group Controller (LGC), Digital Trunk Controller (DTC), and Remote Cluster Controller (RCC) are supported. The base will have a strictly defined interface. This will allow other applications to easily build on it as they come along.

The benefits of this setup will be:

- any XPM type will be able to build on top of the base layer;
- the tool will be more robust due to strict interfaces and modular design;
- new applications will be easier to add.

Users of the current tool will notice only minor differences:

- the XPM load name will now be printed with the logs as well as on the MAP display;
- the tool will now report on the MAP display if the XPM is not responding, indicating that it either does not support the tool (e.g., small memory DTC loads) or that something serious is wrong with the XPM;
- the load name and status lines will now appear on the screen as soon as the PERFORM sublevel is entered.

As well, known errors in data displays will be corrected.

FEATURE DESCRIPTION

This feature implements enhancements to feature AC0024: XPM real time and performance tools (whose functionality is covered briefly in the section titled "Feature Background"). The main reasons for the enhancements are to:

- provide a software base upon which specific XPM applications such as the Message and Switching Buffer (MBS) and Cell Site Controller (CSC) can be built;
- make the tool more robust by correcting deficiencies in the original implementation and by enforcing a strict interface to all applications.

The current tool was designed to be used on only LTC, LGC, DTC and RCC type XPMs. The enhancements will separate this application from the base code opening the way for other XPMs such as MSB and CSC to build applications specific to their internal structure.

By defining a strict interface, the base code will be isolated from each particular XPMs implementation details. Two basis tools were provided by the feature: PM activity (PMAct) and DELAYS. Their basic functionality is explained in the following sections.

PM Activity:

PMAct measures and records real time used in the signal processor (SP) and the master processor (MP). Within each processor the real time is divided into two categories:

- call processing
- low priority background.

Origination and termination counts are displayed below the occupancy data. These counts can be used to quickly determine the approximate call rate on the peripheral.

Also displayed at this level is p-side channel and UTR usage. The total available, peak in use and average in use numbers are displayed.

DELAYS:

DELAYS provides information on call processing delays such as:

1. Dialtone Delay - the period of time from when the peripheral sees the offhook to the time when dialtone is applied. It does not include the offhook filter time in the LCM. Dialtone delay is subdivided into three categories: dial pulse/electronic business set lines (DP/EBS), Digitone (DT) lines and DT lines using Universal Tone Receivers (UTRs).
2. Dialtone Removal Delay - the time from when the peripheral sees the first digit until IDLE tone is applied and dialtone is removed. This does not include any filtering in Channel Supervision Messaging (CSM) for digitone digits. This measurement is divided into three categories: DP/EBS lines, DT lines and UTR serviced lines.
3. Post dialing Delay - the time from the last digit dialed until the application of audible ringing. Post dialing delay is divided into three categories: DP/EBS lines, DT lines and UTR serviced lines.
4. Answer - the time from the terminating line answer seen by the

LGC to the transmission of the offhook to the originating end.

5. Speech path - the time from the offhook seen by the originating party to the application of PCM (speech path) between the two parties. This time includes the CSM filter time.

6. PCM Cutthrough (CT) - the combination of answer and speech path. This is the time to connect speech path after the offhook.

The data for each call processing delay is divided into the following three sections for each of DP and DT:

- average delay
- 50 percentile - 50th of all delays were less than this value
- 95 percentile - 95th of all delays were less than this value.

The DELAYS level shows values for the previous 15 minutes as a moving average. The screen is updated every minute.

Ref: FDOC AG0485

NTX833AA03 Status: RTM STP OPERATIONS

SOS	:	
TPS(3.5) WITH TASKED MESSAGE HANDLING		F6610
LIM DIAGNOSTICS	:	
STP - LIM RATE ADAPTER DIAGNOSTICS		F6612
STP - LIM CLOCK DIAGNOSTIC		F6613
LIV7 DIAGNOSTICS	:	
LIV7 DIAGNOSTICS		F6635
LIV7	:	
LIV TO LIV PROTOCOL		F6637
LIM CONTROL	:	
LIM OM AND LOGS		F6640
LIM RATE ADAPTER ENHANCEMENTS		F6641
FTS MAINTENANCE	:	
FTS ROBUSTNESS AND FAULTS		F6642
LIV7 CONTROL	:	
9X74 FIRMWARE		F6644
LIM DIAGNOSTICS	:	
LIM CLOCK DIAGNOSTICS		F6645
LIM MAINTENANCE	:	
LIM CORE MAINTENANCE I		F6663
LIM CORE MAINTENANCE II		F6664
LIM LOCAL MAINTENANCE		F6665
LIM F BUS MAINTENANCE		F6666
MTP	:	
STP - MESSAGE TRANSFER PART		F6679
FTS BUFFER	:	
BUFFER MANAGEMENT SYSTEM		F6967
TPS ROBUSTNESS AND FAULTS		F6968
MTP	:	
STP MTP ROUTESET MANAGEMENT		F6978
STP MTP CAPABILITY CODES		F6979
MAINTENANCE	:	
PHYSICAL LEVEL MAINTENANCE FOR FBUS		F7108
FTS MAINTENANCE	:	
FTS PHASE I		F7110
MAINTENANCE	:	
STP STP LIU7 MAINTENANCE		F7111
SS7 MTP LINKSET MANAGEMENT		F7112
STP LIM LOCAL CONTROL		F7114
STP LIM MMI		F7115
STP LIM MAP		F7116
LIV7 MAINT	:	
LIV7 CORE MAINTENANCE II		F7135
MAINTENANCE	:	
TABLE CONTROL FOR STP LIM		F7154

Package	NTX833AA03 STP OPERATIONS
Feature set	MTP
Feature	STP - MESSAGE TRANSFER PART
Feature no	F6679

FEATURE SYNOPSIS

This feature provides the Message Transfer Part (MTP) functions required for the DMS-STP (Signaling Transfer Point) product.

FEATURE DESCRIPTION

MTP comprises the first 3 layers of CCS7 protocol. The overall function of the MTP is to serve as a transport system providing reliable transfer of signaling messages, in correct sequence without loss or duplication, between the Signaling Points (SP) of the network.

The MTP is separated into three functional levels:

1. Signaling Data Link Level
2. Signaling Link Function Level
3. Signaling Network Function Level

This feature conforms to the ANSI/ECSA specification for MTP (T1X1, Bellcore TR246, Bellcore TR82).

Ref: DDOC AC0247

NTX835AA01 Status: RTM STP - SEAS (1.1) OPERATIONS

SEAS	:	
CAPABILITY (1.1)		F6976
SEAS COMMANDS	:	
STP - SEAS DELAYED ACTIVATION COMMANDS		F7148
SEAS	:	
SEAS DATA COLLECTION II		F7348
SEAS - TABLE CONTROL REPORTING		F7362

Package	NTX835AA01 STP - SEAS (1.1) OPERATIONS
Feature set	SEAS
Feature	CAPABILITY (1.1)
Feature no	F6976

FEATURE SYNOPSIS

This feature implements the Signaling, Engineering, and Administration System (SEAS) interface.

FEATURE DESCRIPTION

The SEAS interface allows the Operating Company to perform all the engineering and administration required for their Signaling Transfer Point (STP) network from a single center, referred to as a SEAC (Signaling Engineering and Administration Center).

The layered design of the DMS SEAS interface allows new messages to be added to the interface protocol and changes to be made to existing messages without requiring large amounts of restructuring.

Five major administrative functions are provided through the SEAS interface.

Engineering

Service Surveillance and Administration (Network Monitoring)

CCS Network Management Reporting

CCS Network Maintenance Surveillance

Recent Change and Verification (Provisioning)

The information flow between the SEAC and the STP consists of request messages from the SEAC and response and autonomous messages from the STP. These messages are grouped into five functional categories.

Data Collection Messages

Recent Change and Verification (Provisioning) Messages

STP-SEAC On-Occurance Autonomous Messages

SEAC-STP Application Control Messages

Transparent-Mode (Flow Through) Messages

A new log class, SEAS, has been added to identify the various logs generated by SEAS.

A new table, SEASPVC, has been added to allow specification of the data on the Private Virtual Circuits (PVC) used on the X.25 links connecting the STP to the Signaling, Engineering, and Administration Center (SEAC). Several new office parameters have also been added to allow some control over the disk utilization.

A new MAP level has been added. This SEAS MAP level is found off the CCS7 MAP level and is used to monitor and maintain the SEAS system.

Ref: FDOC AC0318

Package	NTX835AA01 STP - SEAS (1.1) OPERATIONS
Feature set	SEAS COMMANDS
Feature	STP - SEAS DELAYED ACTIVATION COMMANDS
Feature no	F7148

Synopsis

This feature allows recent change and verify (RC&V) commands from the SEAC to be stored and executed at a later time. This permits flexible use of DMS-STP resources.

Implementation

The time to execute the command is specified in the SEAC command.

RC&V commands that have time-of-activation parameter set are executed at the specified time

RC&V commands that request delayed activation without a specified time are grouped by item and order number. They are executed when an activation command arrives from the signaling engineering and administration center (SEAC).

RC&V commands are deleted from the delayed activation database when the command arrives from the SEAC.

Up to 24 different activation times are allowed for delayed activation of commands.

Up to 100 different commands are allowed to be pending for delayed activation.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- BTX001AA Common Basic
- NTX832AA STP Base
- NTX833AA STP Operations

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

Unexecuted commands are lost during a BCS upgrade or reload restart.

Reference: FDOC AC0175

Package	NTX835AA01 STP - SEAS (1.1) OPERATIONS
Feature set	SEAS
Feature	SEAS DATA COLLECTION II
Feature no	F7348

Synopsis

This feature collects OM history for 30-minute, 60-minute, and 24-hour time intervals. Commands to request OM history from the signaling engineering and administration center (SEAC) are introduced. This simplifies the production of custom-design reports.

Implementation

The new SEAC commands are:

- * SEND-SCH-MEAS, which requests the signaling transfer point (STP) to send scheduled measurements to the SEAC. These include:
 - 30-minute schedules P_SYSTOT and P_COMP
 - 24-hour schedule P_MTCD
 - snapshot P_RBASE
- * SEND-DEM-MEAS, which requests the STP to send demanded measurements to the SEAC. These include:
 - 30-minute schedules P_SYSTOT and P_COMP
 - 60-minute schedule D_MTCH
 - 5-minute schedules D_NM and A_NM
 - 24-hour schedule P_MTCD
 - snapshot P_RBASE
 - day to hour schedule D_MTCPTH

OM history data are stored in 74 disk files on disk volume D000SEASBF. They are created when SEAS goes from offline to man-busy. They are erased when SEAS goes from man-busy to offline. The amount of disk store required is 1068.8 kwords.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX832AA STP Base
NTX833AA STP Operations

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The INH-COLL and ALW_COLL commands are not supported.

OM history disk files do not survive reload restarts.

Schedules P_SERV and P_SPST are not supported.

Reference: FDOC AL0986

Package	NTX835AA01 STP - SEAS (1.1) OPERATIONS
Feature set	SEAS
Feature	SEAS - TABLE CONTROL REPORTING
Feature no	F7362

Synopsis

This feature provides a two-way flow of information between the signaling transfer point (STP) and the signaling engineering and administration center (SEAC) to ensure that both have the same information about the STP's link, routing, and global title translation data. Recent change and verification (RC&V) messages are used to provision an STP.

Implementation

RC commands that result from table-control changes:

- * ASGN-SID assign self-identity
- * CHG-SID change self-identity
- * ASGN-RTE assign ordered route
- * DLT-RTE delete ordered route
- * CHG-RTE change ordered route
- * ADD-LS add a link set
- * DLT-LS delete link sets
- * CHG-LS change a link set's attribute
- * ASGN-SLK disconnect signaling link
- * DISC-SLK disconnect signaling link
- * ADD-GTT add ordered GT translation objects
- * DLT-GTT delete ordered GT translation objects
- * CHG-GTT change ordered GT translation objects

These commands apply to the following databases:

- * C7NETWRK CCS7 network table
- * C7ALIAS capability code (alias) table
- * C7LKSET linkset table
- * C7LINK link table
- * C7RTESET routeset table
- * C7GTT global title table

RC commands that result from link-state changes:

- * CHG-SLK change link attributes

Three link-states are recognized:

- * ACT active
- * UAV unavailable

* OOS out of service

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX832AA STP Base
NTX833AA STP Operations

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

There are no restrictions on the use of this feature.

Reference: FDOC AC0167

Package	NTX839AA01 STP - ENHANCED MAINTENANACE AND BERT
Feature set	BERT
Feature	MTP - BERT CAPABILITY FOR STP
Feature no	F6977

FEATURE SYNOPSIS

This feature provides Bit Error Rate Testing (BERT) access and control at the LIU7 level of the Maintenance and Administration Position (MAP) to allow the craftsperson to test the integrity of the data path on selected CCS7 signaling links in the DMS Signaling Transfer Point (STP).

FEATURE DESCRIPTION

Bit Error Rate Testing (BERT) is a facility to measure the quality of a digital transmission path. This facility is provided by this feature to enable the craftsperson to evaluate the performance of a CCS7 signaling link before putting it into service, and to aid in isolating hardware troubles that are affecting the performance of the link.

Ref: FDOC AC0420

Package	NTX840AA01 STP - GATEWAY MESSAGE SCREENING
Feature set	GATEWAY
Feature	STP GATEWAY
Feature no	F7194

Synopsis

The DMS-STP Gateway Screening feature allows the operating company to control access to its CCS7 network thereby permitting revenue-generating intelligent network services without putting proprietary information at risk. Initial applications include operating company verification of out-of-region credit cards, and implementation of Custom Local Area Signaling Services (CLASS) in metropolitan areas served by more than one operating company.

When placed on a DMS-STP at the entrance to a CCS7 network, STP Gateway Screening can use MTP and SCCP information to prevent unauthorized access to any data base in the network and to prevent the use of unleased facilities and services. Traffic from unstable CCS7 networks can also be quickly blocked when signs of messaging difficulties appear.

To increase flexibility, a different set of screening instructions can be specified for each signaling data linkset that interfaces the DMS-STP.

Implementation

New log CCS500 reports that the threshold value for the number of MSUs discarded by the screening functions has been reached for a particular linkset.

New log CCS501 reports that the threshold value for the number of MSUs received from other networks has been reached for a particular linkset.

New log CCS502 reports that a MSU has been discarded by a screening function.

New log CCS503 reports when an error occurs within a screening function.

New log CCS504 reports when a screening function rule cannot be sent to a LIU7 peripheral.

New table C7GTWLKS defines the gateway screening parameters associated with a linkset.

New table C7ALWOPC specifies screening functions for allowed originating point codes.

New table C7BLKOPC specifies screening functions for blocked originating point codes.

New table C7ALWDPC specifies screening functions for allowed destination point codes (DPC).

New table C7BLKDPC specifies screening functions for blocked destination point codes.

New table C7ALWSIO specifies screening functions for allowed service information octets (SIO).
New table C7DSTFLD specifies screening functions for the destination field of signaling network management messages.
New table C7CGPA defines the gateway screening functions for the SCCP calling party address (CGPA).
New table C7ALWGTT defines the gateway screening functions for SCCP global title translation types (GTT).
New table C7CDPA defines the gateway screening functions for the SCCP called-party address (CDPA).
New table C7AFTPC defines the gateway screening functions for the SCCP management (SCMG) affected point code and subsystems.

New OM group C7GTWSCR keeps track of the number of messages discarded by each screening function.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX833AA STP Operations

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

A maximum of 1000 OM tuples can be defined in OM group C7GTWSCR.

A linkset cannot be added to C7GTWLKS unless it is in C7LKSET. A linkset cannot be removed from C7LKSET unless it is first removed from C7GTWLKS.

The number of screening functions defined for each linkset is limited by the available data store in the LIU7s. If there is not enough space, the LIU7 may not go in service or screening errors could occur.

Reference: FDOC AC0432

Package	NTX843AA01 CELLULAR INTERCONNECT
Feature set	ADMINISTRATION
Feature	TYPE 2A CELLULAR INTERCONNECTION
Feature no	F2916

FEATURE SYNOPSIS

This feature allows type 2A interconnection from a Cellular Mobile Carrier (CMC) to a DMS-200 switching system. Calls may be routed to an interexchange carrier (IEC), another CMC, or to a termination within the Local Access and Transport Area (LATA).

FEATURE DESCRIPTION

Type 2A interconnection applies to signaling between the CMC switch and the Access Tandem (AT).

This feature adds the trunk type CELL to Table TRKGRP. Trunks requiring type 2A interconnection to a CMC should be datafilled as CELL trunks.

Two new call codes have been added by this feature. A call code 64 record is made for all calls originating to a CMC; a call code 66 record is made for all calls terminating from a CMC.

Ref: FDOC AL0380

Package	NTX843AB01 CELLULAR INTERCONNECT(UPG. OF NTX843AA IN BCS27
Feature set	ADMINISTRATION
Feature	MF MONITOR FOR TYPE 2A CELLULAR INTERCONNECT
Feature no	G0115

Synopsis

Multifrequency (MF) Monitor for Type 2A Cellular Interconnect allows the access tandem to monitor the MF digit stream of Feature Group D calls from a cellular mobile carrier (CMC). This permits the called number to be included in Automatic Message Accounting (AMA) records, in compliance with Bellcore FSD 20-25-0100.

The signaling on Feature Group D calls from a CMC over a Type 2A interconnection to an interexchange carrier (IC) is identical to that provided on connections from Equal Access End Offices. The access tandem receives the signal from the CMC, establishes the connection to the IC, and puts the connection through. The MF outputting, consisting of the calling and called numbers, then passes directly from the CMC to the IC normally undetected by the access tandem. This feature permits the DMS-200 access tandem to attach an MF monitor to collect the requisite digits.

Implementation

Table OCCINFO has new field CCMON. CCMON is set to 'Y' to monitor the connection between the CMC and IC/INC. The connection is monitored to determine the called directory number. The originating IC/INC billing record, call code 110, and the terminating CMD billing record, call code 66, are updated if CCMON = 'Y'.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
 NTX001AA Common Basic
 either NTX186AA Equal Access End Office
 or NTX386AA Access Tandem Switch
 either NTX098AA AT&T Cama Format
 or NTX159AA AT&T Lama Format
 either NTX801AA Toll Features I
 or NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

This feature only applies to FGD calls: national, international and 950.

Reference: FDOC AF1451

Package	NTX850AA01 TOPS ALTERNATE ANNOUNCEMENT
Feature set	TOPS DRAM ANNOUNCEMENTS
Feature	TOPS ALTERNATE ANNOUNCEMENT
Feature no	F2917

FEATURE SYNOPSIS

This feature provides a unique identifier for each DRAM announcement, allowing the telephone operating company to change any single announcement independently of any other (e.g., company handling of thank-you's).

FEATURE DESCRIPTION

This feature is part of NTX850AA TOPS Alternate Announcements. It is used in conjunction with MCCS and for ACTS.

The new tables for interLATA carrier "thank you" announcements, may be datafilled only in offices equipped with TICS.

DRMUSERS to provide a unique index for each announcement in an MCCS or ACTS call. In offices equipped with TICS, two new tables, EAMCCSAN and EAACTSAN may be datafilled to allow interLATA carriers to customize "thank you" announcements.

Ref: AL0417

Package	NTX851AA01 SMDR DERIVED FROM BCR AMA
Feature set	AMA
Feature	SMDR VIA RAO - BELLCORE AMA RECORD
Feature no	F2923

FEATURE SYNOPSIS

This is an optional feature that provides a new indicator in the "Service Observed, Traffic Sampled" field of Bellcore Automatic Message Accounting (AMA) records. The purpose of this indicator is to designate the AMA record as one which requires Revenue Accounting Office (RAO) processing for Station Message Detail Recording (SMDR) purposes.

FEATURE DESCRIPTION

AMA records will be marked if the originator of the call belongs to an Integrated Business Network (IBN) customer group that has been designated for derived SMDR. IBN originators applicable to this feature include IBN line, IBN trunk, attendant console, virtual facility group, direct inward system access.

Each DMS Bellcore AMA record which requires RAO processing for SMDR purposes will have character 1 of the "Service Observed, Traffic Sampled" field set to the value of "4".

This feature is applicable to all Bellcore AMA call codes from the previously mentioned IBN originators.

Designating an IBN customer group for derived SMDR is done at the option of the Telco via table CUSTSMDR. Designating an IBN customer group for derived SMDR does not force an AMA record to be produced. Unbillable calls made by members of such a group will not produce an AMA record solely because the group is designated for derived SMDR.

Package	NTX856AA02 IBN ATTENDANT CONSOLE OM ON AN INDIVIDUAL CONSOLE
Feature set	ATTENDANT FEATURE
Feature	IBN ATTENDANT CONSOLE OM ON AN INDIVIDUAL CONSOLE
Feature no	F2946

FEATURE SYNOPSIS

This feature provides Operational Measurements (OM) for individual Attendant Consoles.

FEATURE DESCRIPTION

A new OM group, IBNAC, is introduced to allow individual Attendant Console OMs to be reported over various periods of time. In addition, several new fields have been added to the OM group IBNSG, to ensure that all individual console OMs have an equivalent subgroup OM which can be scheduled through an OM report.

This feature introduces a new MAP screen, INACOM, with several peg count fields to display data on an individual console basis. The IBNMEAS menu area has been expanded to include the new INACOM command to allow selection of the INACOM MAP display.

All counts included in the MAP display are available through an OM report, but the new OM group contains some usage counts that will not appear on the MAP display.

Ref: FDOC AL0522

Package	NTX856AA02 IBN ATTENDANT CONSOLE OM ON AN INDIVIDUAL CONSOLE
Feature set	IBN
Feature	PEG COUNTS ON LISTED DIRECTORY NUMBERS ON ATTENDANT
Feature no	F2982

Synopsis

This feature expands the current Operational Measurements (OM) system for Attendant Consoles by providing separate peg counts for each Listed Directory Number (LDN) assigned in a console customer group. Eight new LDN count fields are added and pegged each time an attendant answers a call to the LDN; thus, OMs are provided on an individual console basis per LDN. Information is recorded for up to seven LDNs each time an attendant console answers a call to the LDN. The eighth field is pegged for calls that are routed from another group or subgroup, for example, a call is rerouted if the terminating attendant console is in night service.

The data can be either requested or scheduled using the same procedures as currently exist through the OM system.

Implementation

New IBN OM group IBNSGLDN has eight fields for up to eight LDNs. Each field counts the number of times an attendant answers a call to the corresponding LDN. These are provided on a customer subgroup basis.

Existing IBN OM group IBNAC has eight new LDN fields. Each field counts the number of times an attendant answers a call to the LDN. These are provided on an individual console basis per LDN.

New field LDN_OM_REPORT is prompted for if the directory number selector, DN_SEL is 'M' in table WRDN. This field can take values 'Y' or 'N'. A value of 'Y' indicates that this LDN tuple is one of seven LDNs of the customer subgroup to be pegged.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX410AA Dynamic Attendant Console Measurements
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature adds additional fields to INACOM MAP displays.

Limitations

Only LDNs with field DN_SEL = 'M' in Table WRDN are included in the OMs provided by this feature.

More than seven LDNs can be assigned to a customer subgroup but attempting to datafill LDN_OM_REPORT with a 'Y' on the eighth tuple or higher generates an error message and is disallowed.

Reference: FDOC AD1439

Package	NTX857AA01 CALL FORWARDING SPECIAL - MDC
Feature set	STATION FEATURES
Feature	IBN-OPTIONAL CALL FORWARD LINKS
Feature no	G0017

FEATURE SYNOPSIS

The Optional Call Forward Links feature allows the Meridian Digital Centrex (MDC) or Residential Enhanced Services (RES) customer to designate the number of times a terminating intra-office call can be forwarded to remote stations.

FEATURE DESCRIPTION

The Optional Call Forward Links feature assigns the maximum number of times an incoming call may be consecutively forwarded. This number is applicable to all the various types of Call Forward features assigned to the lines belonging to the customer group.

This feature is implemented through a new option, CFXOL, in Table CUSTSTN. When the option CFXOL is entered, a new subfield, MAXLINK should be datafilled with the maximum number of call forward links allowed for all lines belonging to the customer group. If this subfield is not datafilled, a default value of 5 is assigned to the customer group.

When an incoming call to an MDC or RES line with a Call Forward feature assigned to it is about to be forwarded, a check is made to determine if this next call forward link will exceed the maximum link value. If so, the forwarding will not be allowed, and appropriate treatment will be given to the call.

Ref: FDOC AL0655

Package	NTX857AA01 CALL FORWARDING SPECIAL - MDC
Feature set	STATION FEATURES
Feature	STATION ACTIVATION OF CFW BUSY/DONT ANSWER
Feature no	G0018

FEATURE SYNOPSIS

This feature allows Meridian Digital Centrex (MDC) station users to program, activate and deactivate Call Forward Busy or Call Forward Don't Answer from their sets using access codes.

FEATURE DESCRIPTION

Call Forward Busy (CFB)

Call Forward Busy allows an MDC station user to redirect calls intended for the base station to another station when the base station is busy.

Call Forward Busy can be programmed and activated in three ways:
 the default method
 the fixed method
 the programmable method

A subfield, CFBCNTL, is added to tables IBNFPEAT and KSETFEAT to indicate which method is used.

The default method of programming and activating CFB uses Service Orders. The programming is done at datafill time and CFB is activated when the feature is assigned to the set. To deactivate CFB, the feature is removed from the set.

This feature introduces the fixed and programmable methods of programming and activating CFB.

The fixed method allows the MDC station user to activate or deactivate CFB, but the programming of the feature is done by the Operating Company using Service Orders.

The programmable method allows the MDC station user to program, activate and deactivate CFB.

A unique set of access codes for CFB activation and deactivation are defined in Table IBNXLA.

Call Forward Don't Answer (CFD)

Call Forward Don't Answer allows a MDC station user to redirect calls intended for the base station to another station when the base station does not answer within a predefined time.

Call Forward Don't Answer is programmed and activated in the same three ways as Call Forward Busy.

A subfield, CFDCNTL, is added to tables IBNFEAT and KSETFEAT to indicate which method is used.

A unique set of access codes for CFD activation and deactivation are defined in Table IBNXLA.

Ref: FDOC AL0656

NTX871AA01 Status: RTM REMOTE TOPS MP O.C. DATA LINK HANDLING

TOPS	:	
REMOTE ONI VIA O.C.		F2602
INTERFACE	:	
REMOTE TOPS MP O.C.-DATA LINK HANDLING		F2938

Package	NTX871AA01 REMOTE TOPS MP O.C. DATA LINK HANDLING
Feature set	TOPS
Feature	REMOTE ONI VIA O.C.
Feature no	F2602

FEATURE SYNOPSIS

Remote Operator Number Identification (RONI) is provided on an office equipped with the operator centralization (OC) remote package.

FEATURE DESCRIPTION

This feature will make RONI compatible with the OC environment as well as standalone.

The method applied here is the concept of gating. Instead of duplicating everything for each environment a 'gate' is added in common code to access environmental specific functions.

The two environments in TOPS are:

- stand alone
- centralized

A table is set up to be indexed by environment and the type of function to be performed.

Package	NTX871AA01 REMOTE TOPS MP O.C. DATA LINK HANDLING
Feature set	INTERFACE
Feature	REMOTE TOPS MP O.C.-DATA LINK HANDLING
Feature no	F2938

FEATURE SYNOPSIS

The Operator Centralization (OC) feature provides the operating company the capability of serving traffic for several remote toll centers at one centralized operator location. This feature creates an optional software package for TOPS-MP application to DMS-200 TOPS OC- remote offices. It enables the remote office to use TOPS-MP positions provided by the TOPS host office.

FEATURE DESCRIPTION

An OC data link is used to carry all call processing information between a host and remote TOPS office. TOPS-MP positions require unique messaging between the host and remote offices to support TOPS-MP capability.

Calls originating from a remote TOPS office are assigned an operator position to serve the call by the host office. If the host selects a TOPS-MP position, the remote must contain this optional TOPS-MP software package in order to be able to communicate properly with the TOPS-MP position.

The messages for screen displays and key functions on TOPS-MP differ from the messages employed for earlier versions of TOPS. This feature supplies the software to support the new TOPS-MP control messages over the OC data link used by the remote office to the position in the TOPS host office.

Ref: F2938

Package	NTX873AA01 HOST TOPS MP O.C. - DATA LINK HANDLING
Feature set	INTERFACE
Feature	HOST TOPS MP O.C.-DATA LINK HANDLING
Feature no	F2940

FEATURE SYNOPSIS

This feature creates an optional software package for TOPS-MP application to DMS-200 TOPS OC-host offices. This feature enables the host office to provide operator services to remotely located DMS-200 TOPS Remote Offices equipped with TOPS-MP hardware/software.

FEATURE DESCRIPTION

The existing subsystem YMPSUB includes software modules which are required for the correct operation of TOPS-MP positions. Specifically, subsystem YMPSUB contains the software for the unique messaging requirements which allow communication with TOPS-MP positions.

In addition, this feature creates a new optional subsystem, YHMPSUB. The exclusion of this optional package allows for the rejection of requests from remote offices for service from TOPS-MP positions. Its inclusion allows TOPS-MP service.

Ref: AF0808

Package	NTX875AA01 CCS7 MASS TRUNK CONVERSION
Feature set	MAINTENANCE
Feature	PTS TO CCS7 MASS TRUNK CONVERSION
Feature no	F2945

FEATURE SYNOPSIS

This feature is designed to help Telcos to minimize the time and effort to convert PTS trunks to ISUP trunks. This feature will be very useful to those offices with large number of trunks to convert. This feature will automate the conversion process where possible.

FEATURE DESCRIPTION

This feature will implement the process and outline the procedure to convert the trunks from PTS to SS7 signalling. Currently, the trunks have to be converted manually by updating tables. This is time consuming if the number of trunks to convert is very large. This feature will automate part of the manual process.

This feature allows Telcos to pre-datafill ISUP trunk data prior to the actual cut over from PTS to ISUP. MAP commands are provided to perform the data conversion to verify ISUP trunks are properly aligned between two switches.

Ref: AL0520

Package	NTX877AA01 INTERFACE TO NON-DATA LINK CONSOLE
Feature set	SERVICES
Feature	NON-DATA LINK CONSOLE CALL EXTENSION
Feature no	F2953

Synopsis

This feature allows 50B customer premises system (CPS) attendant consoles (non-data link) served by the DMS-100 to extend incoming calls with or without a private announcement. This feature also provides a 70 millisecond open interval on the attendant loop answer by the extended-to party.

Implementation

This feature requires a three-port conference circuit.

Table IBNFEEAT has new field, 3WCPUB, with two parameters. The first parameter, set to "Y", applies this feature to a non-data link console. The second parameter designates either the star or octothorp key as the console's SPLIT digit.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX100AA Integrated Business Networks - Basic (IBN)
NTX901AA Local Features I

Activation and Deactivation

The attendant requests public announcement by pressing the START button on the 50B. The START button generates a flash to the central office. When the 50B receives dial tone, the attendant dials the new extension. Both parties receive audible ringing.

The attendant requests private announcement by pressing the SPLIT button on the 50B. This generates a FLASH followed by either an octothorp (#) or a star (³). The attendant then dials the new extension. The other party on the call is placed on hold until the attendant presses the SPLIT button again.

When the extended-to party answers, a 70 millisecond open interval is placed on the attendant loop.

Interactions

To function properly, the attendant line must have the call transfer option assigned.

Limitations

This feature may only be applied to IBN lines served by line concentrating modules.

This feature may not be applied to electronic business sets.

The multi-button electronic set (MET) version of the 50B CPS is not supported.

Reference: FDOC AL0537

NTX878AB02 Status: RTM ENHANCED ELECTRONIC BUSINESS SET SERVICE

IBN	:	
OPTIONAL PRIVACY ON MADNS		F2837
IBN FEATURE	:	
PRIVACY RELEASE CONFERENCE CONTROL		F2889
BUSINESS SERVICES	:	
LAST NUMBER REDIAL ASSOCIATED TO H SET		F2956
INDIVIDUAL PAGE FROM GIC		F2957
ENHANCEMENTS	:	
RING AGAIN ON IDLE EBS		F2963
BUSINESS SERVICES	:	
MAKE SET BUSY EXCEPT GIC		F2964
CALL PARK RECALL IDENTIFICATION		F2967
ORIGINATING/TERMINATING LINE SELECT		F2987
FEATURES	:	
ENHANCED MAON CALL CONTROL		F6682

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	IBN
Feature	OPTIONAL PRIVACY ON MADNS
Feature no	F2837

FEATURE SYNOPSIS

Single-bridge Arrangement (SBA) is a variant of the Multiple Appearance Directory Number (MADN) feature such as Single Call Arrangement (SCA) and Multiple Call Arrangement (MCA). A MADN SBA line, like SCA lines, allows only one call to be set up with an external party. However, only SBA lines allow any group member to bridge into an existing call. Bridging is a process whereby a party conferences itself into a call. In addition, MADN SBA provides a privacy option which can be invoked by any active member to inhibit any other member from bridging into the call.

FEATURE DESCRIPTION

The SBA option is similar to SCA in that only one active call per group is permitted. The key difference is that idle SBA group members can conference themselves into the call provided it is in a stable talking state. Furthermore, any SBA group member active on the call may use the privacy option to prevent other idle members from bridging in. Thus an active SCA call is normally private and an active SBA call normally available to all SBA group members.

SBA bridging uses a single three-port conference circuit whereas SCA privacy release uses at least one six-port conference circuit. The maximum number of conferees allowed in a bridged call is, including the external party, three (3) for an SBA line and thirty (30) for SCA privacy release. Bridged SBA calls can interact with certain conferencing features which may be active on the external party. Thus the actual number of parties active in a call involving at least one SBA line may vary. A stringent conferee number limit was placed on SBA lines to maintain good voice quality.

EBS OPERATION

SBA Operation for Incoming Calls:

Every MADN member's lamp flashes for unanswered incoming calls.

When an idle member presses his MADN key, the call is answered and each MADN member's lamp goes solid. Hence, there is no difference between the MADN lamp states of the active and idle members. The call is now said to be in a 'stable talking state'.

If no idle member has yet bridged into the call, the active member, having full control of the call, may attempt to activate any IBN feature. For example, the active member may activate MADN hold. The state of each MADN

member's lamp is winking. Any member may access the call by pressing his MADN key. The call returns to a stable talking state and the lamps of all members return to the solid state.

Setting up a Conference Bridge:

Any idle member may attempt to bridge into an active call by pressing his MADN key. If bridging cannot be allowed, the idle member will be given treatment and then locked out. Otherwise, the active parties will receive a warning tone and a three-party conference bridge will be established. The state of each MADN member's lamp remains unchanged. The only confirmation the bridging member receives is a voice connection.

An idle member who attempts to bridge into a call will receive audible treatment and be locked out if a call is private or if a three-party conference bridge is currently established.

Activating the Privacy Option:

Any active member may activate the privacy option by pressing a dedicated key on the EBS or by flashing and dialling an access code. This active member, who is now the privacy controller, will hear a confirmation tone as there is no lamp associated with the privacy key. The state of each MADN member's lamp remains unchanged.

Cancelling the Privacy Option:

The privacy controller is the only member allowed to cancel privacy on a call. Cancellation is achieved by pressing the privacy key or by dialling the privacy access code. The privacy controller will hear a confirmation tone. The state of each MADN member's lamp remains unchanged.

Leaving a Conference Bridge:

An active member may leave the call at any time by pressing the release key or by going onhook. The MADN lamp of the releasing member remains solid if the call is still up. The lamp state of all other members remains unchanged. If the member who leaves a private call is the privacy controller, the call will remain private until it is taken down.

Remarks:

If a multi-party conference is still established and an active member presses his hold key or another DN key, the call becomes locally held. Local hold, unlike MADN hold, is transparent to all other parties in the call. The result is that the MADN lamp of the locally held member winks and the lamp state of all other members remains unaffected. The locally held member may reaccess the call by pressing his MADN key.

If only a single member remains in the call and the external party is still present, the active member retains full control of the call and may

activate any IBN feature. It should be noted, however, that privacy cannot be activated or cancelled while another IBN feature is active on the call.

If the external party leaves a multi-party conference, all bridging and privacy activation/cancellation attempts are ignored. The result is an isolated conference comprised of the SBA members who were already active on the call.

500/2500 Set Operation:

The functionality for these sets is the same as for EBS's. However, all references made to lamp states and key hits do not pertain. In particular, an idle member bridges in a call by going offhook. Privacy and MADN hold are enabled and cancelled via access codes.

Ref: FDOC BR0837 Optional Privacy on MADN's

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	BUSINESS SERVICES
Feature	LAST NUMBER REDIAL ASSOCIATED TO H SET
Feature no	F2956

FEATURE SYNOPSIS

The feature Last Number Redial Associated with Set (LNRA) provides the means to redial the last number called from a Meridian Business Set (MBS) by either depressing a single key or dialing a feature access code. LNRA is an IBN feature, applicable to DMS-100 and SL-100.

FEATURE DESCRIPTION

LNRA is a feature that is offered for MBS's and is assigned on a per set basis. It allows a user to access any free DN compatible with LNRA on the set and by activating the feature, have the last number dialed from the set automatically redialed. After choosing a DN key, LNRA can be activated three ways:

- depress # key once
- depress # key twice
- dial feature access code.

If # key is depressed twice, the call is placed sooner than if # key is depressed once.

The feature access code for LNRA is the same as that for LNR.

When LNRA is first assigned to a set, no number is stored as the last number dialed. In this case, a reorder tone will be heard if the user attempts to activate the feature.

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	BUSINESS SERVICES
Feature	INDIVIDUAL PAGE FROM GIC
Feature no	F2957

FEATURE SYNOPSIS

This feature provides for one member of a GIC (Group Intercom) group, using the GIC key of his MBS (Meridian Business Set), to activate the built in alerting speaker of another GIC member's MBS for paging purposes. Both of these GIC members must be in the same GIC group. If a two-way conversation is desired, the called party may depress the 'ON' key of his handsfree unit or lift his handset.

FEATURE DESCRIPTION

This feature provides individual paging through MBS's within GIC groups.

When MBS-1 calls MBS-2 via a GIC key, if upon receiving audible ringing MBS-1 again depresses his GIC key, a one-way speech path will be established between MBS-1 and the built in speaker of MBS-2. (This is providing that MBS-1 is not involved in any type of conference call and that MBS-2 has no active DN's). Once this one-way speech path has been established, if MBS02 answers the GIC call, either via the 'ON' key of his handsfree unit or lifting his handset, a two-way speech path will result.

If the originator called the terminating GIC member via an alternate key, i.e., a three way call key, a transfer key, or a conference key, the terminator may not be paged. Any attempts to page will be ignored and no indication will be given to the originator.

If the terminator has any active DN's (i.e., is actively talking with someone, programming a key, or dialing) when the second GIC key depression occurs, the originator's GIC lamp will start to flash for about 5 seconds and the GIC call will proceed as if the GIC 'page' feature was not requested (i.e., the originator will keep hearing audible ringing). The originator's lamp will then return to the solid state. Note, if any actions are performed during the 5 seconds of the GIC key flashing which involves changing the state of the GIC key lamp, the 5 second flashing state will be overridden. All subsequent GIC keyhits will be ignored.

If while being 'paged' the terminator depresses another DN key, the GIC originator will be put on hold with no indication just as if a normal two-way speech connection existed.

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	ENHANCEMENTS
Feature	RING AGAIN ON IDLE EBS
Feature no	F2963

Synopsis

This feature modifies existing Ring Again (RAG) operation by preventing Ring Again Call Back to the Ring Again originator unless the Meridian Business Set (MBS) is idle. The recall is made only if all of the DN keys on the MBS are idle.

Implementation

The Ring Again "Call Back to an Idle Meridian Business Set" is provided by an option at the customer group level. Table CUSTSTN parameter RAGCOPT is set to 'Y' to activate the feature. The default value for this parameter is 'N'.

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic (IBN)
- NTX101AA IBN - Enhanced Business Services
- NTX106AA IBN - Proprietary Business Set
- NTX901AA Local Features I

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature does not affect the operation of any existing feature.

Limitations

The caller must have an MBS with RAG assigned to use this feature.

It is not recommended that this feature be used with MBSs with ADDONS (many DNs) because of the real time required to determine whether the set is idle.

Reference: FDOC AD0637

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	BUSINESS SERVICES
Feature	MAKE SET BUSY EXCEPT GIC
Feature no	F2964

FEATURE SYNOPSIS

This feature applies only to "keysets" (i.e., p-phones and SL-100 Meridian sets). Only keysets with make set busy (MSB) key are affected.

MSB is an existing feature, which allows the user to busy out his/her entire set by pressing a MSB feature key.

This feature will permit incoming calls to terminate on some keyset DN appearances, even while the MSB feature is active on the set. There will be two 'flavours' of MSB selection:

1. The first is an exemption from MSB of incoming Group Intercom (GIC) calls.
2. The second is a selection of DNs on a keyset which will have MSB applied when the MSB key is pressed by the user. The remaining DNs will be exempted from MSB. This will allow incoming calls to terminate on these DNs.

FEATURE DESCRIPTION

With respect to the second flavour of MSB selection, code activated MSB and key-activated MSB will interact. After activating MSB on selected (possibly all) DNs by pressing the MSB key, the user can use MSB activation and deactivation codes to "touch up" the MSB configuration on the keyset.

The function of the MSB lamp will change from indicating that all the DNs are MSB to indicating that at least one DN is MSB. Both key and code-activated MSB will be able to update the lamp.

GIC MSB Exemption: The system administrator will be able to designate an Intercom Group as exempted from MSB, at the time when the group is created. It will also be possible to change the exemption status of a previously existing Intercom Group. GIC calls in MSB exempted groups will terminate normally, regardless of the state of the MSB key.

DN Key MSB Selection: The system administrator will also be able to designate a subset of DN keys on a keyset that are affected by a MSB key activation. Incoming calls terminating on these DNs will receive busy treatment. Incoming calls terminating on any other DNs on the set will complete.

The user may use MSB activation/deactivation codes to override the default MSB configuration.

Interaction: The two flavours of MSB selection will interact in the following way:

GIC exemption will always take precedence over DN selection. This means that if the user has GIC MSB exemption, the GIC line will always be exempt, regardless of DN MSB selection datafill. If GIC MSB exemption is removed, the system administrator may still use DN MSB selection to exclude the GIC line from MSB.

MSB Selection with ACD, MADN & KSH: MSB selection and ACD will be incompatible. This feature will interact successfully with hunt groups, MADN and KSH.

Ref:

FDOC AL0619, Make Set Busy Except GIC
FDOC BV0936, P-Phone Make Set Busy
FDOC BC0930, P-Phone Group Intercom

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	BUSINESS SERVICES
Feature	CALL PARK RECALL IDENTIFICATION
Feature no	F2967

FEATURE SYNOPSIS

This feature provides the ability to distinguish Call Park (PRK) and Directed Call Park (DCPK) recall type calls from other call types.

FEATURE DESCRIPTION

This feature enables an Electronic Business Set (EBS) user to distinguish PRK and DCPK recall type calls from other call types. If the user has a display set with a PRK/DCPK feature key, the Call Park or Directed Call Park recall will be identified by a flashing directory number (DN) liquid crystal display (LCD), distinctive ringing, a flashing Call Park or Directed Call Park key LCD, and a displayed Call Park recall message. If the EBS does not have a display, the recall will be identified in the same manner as just described except that no display message will be given. In a like manner, if the user has an EBS with a display but accesses the PRK/DCPK feature via a feature access code instead of via the PRK/DCPK feature key, the recall will occur in the same fashion as detailed above except that the only LCD that will flash upon recall is that of the DN which parked the call.

This feature also functions in a limited manner for an EBS that does not have a display or a PRK/DCPK feature key and for a 500/2500 set. The only way for users of these types of sets to distinguish call park recall type calls is by distinctive ringing.

Ref: FDOC - AD0908

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	BUSINESS SERVICES
Feature	ORIGINATING/TERMINATING LINE SELECT
Feature no	F2987

Synopsis

The Originating/Terminating Line Select feature provides Electronic Business Sets (EBS), M5000 series sets, and M2000/M3000 series sets with various selection options for originating or answering calls. The originating selection options are Idle Line Select and No Line Select. The terminating selections options are Incoming Call Select and No Line Select. The Idle Line Select and Incoming Call Select options automatically connect a line when the set user goes off-hook. With the No Line Select option the set user must manually select a line.

Implementation

This feature adds two new options to Table KSETFEAT to define originating line selection options (OLS) and terminating line selection options (TLS).

The following feature packages are necessary for this feature to operate:

- NTX000AA Bilge
- NTX001AA Common Basic
- NTX100AA Integrated Business Networks - Basic
- NTX101AA IBN - Enhanced Business Services
- NTX106AA IBN - Proprietary Business Set
- NTX901AA Local Features I

Activation/Deactivation

If the Originating Line Selection (OLS) option is Idle Line Select, an idle line is automatically connected when the set user goes off-hook.

If the Originating Line Selection option is No Line Select, the set user must manually select the originating line by pressing the desired DN key. Silent treatment is provided until a DN key is manually selected.

If the Terminating Line Selection option is Incoming Call Select, an incoming call is automatically selected when the set user goes off-hook.

If the Terminating Line Selection option is No Line Select, the set user must manually select the line to answer by pressing the desired DN key. Silent treatment is provided until a DN key is manually selected.

Interactions

Any DN datafilled in Table KSETLINE can potentially be selected on an idle search. If the DN selected on an OLS idle search would typically send the originator to treatment, it will do so in this case.

Restrictions

Only one Originating and one Terminating Selection Option can be defined through datafill at any one time.

Terminating selection options take precedence over originating selection options when an incoming call is presented to the set.

Originating Line Select and Terminating Line Select options can only be datafilled against the Primary Directory Number.

Automatic Call Distribution sets are not subject to originating and terminating options; Originating Line Select and Terminating Line Select options can not be datafilled for Automatic Call Distribution sets.

Reference

FDOC AD1514

Package	NTX878AB02 ENHANCED ELECTRONIC BUSINESS SET SERVICES(UPG. OF
Feature set	FEATURES
Feature	ENHANCED MAON CALL CONTROL
Feature no	F6682

FEATURE SYNOPSIS

This feature introduces a new table, MDNGRP, which contains a list of options and attributes for every MADN group appearing on a DMS-100 switch. This datafill scheme offers greater potential for customizing MADN lines.

FEATURE DESCRIPTION

Single Bridged Arrangement (SBA), Multi-Bridged Arrangement (MBA), or custom bridging functionality can be obtained by datafilling the following options and attributes for a particular Single Call Arrangement group in Table MDNGRP.

Denial Treatment

Defines the type of audible treatment which should be given to a member in response to an invalid bridging attempt.

Bridging Allowed

Indicates whether the corresponding Single Call Arrangement group has bridging capability.

Conference Bridge Size

Expresses the maximum conference bridge size.

Bridge Tone Required

Indicates whether a barge-in warning tone should be heard by all active parties when a new member bridges into the call.

Initial Privacy Status

Indicates whether a call is normally private or not. The bridging user interface is largely based on this setting.

Privacy Release Mode

Determines the operation mode of Privacy Release (PRL).

Ref: FDOC AG0977

Package	NTX881AA01 SWITCH BIT ERROR RATE MAINTENANCE(UPG.BY NTX881AB)
Feature set	MAINTENANCE
Feature	SWITCH BER INDICATOR
Feature no	F6355

FEATURE SYNOPSIS

The purpose of this feature is to develop a tool which a customer can use to monitor the bit error rate performance of their switch.

FEATURE DESCRIPTION

A test from the BERP level is actually composed of many individual Bit Error Rate Tests (BERT). A single BERT consists of connecting an IBERT either to itself or to a Data Line Card (DLC) and transmitting a known bit pattern. The known bit pattern is reflected back to the IBERT where it is compared to what was sent. Any errors found in the returned bit stream are recorded. The results of all the individual BERTs comprise the result of the BERP test.

The key statistics generated by these test calls will be number of calls made, number of calls in error, total number of bit errors encountered in the test run, total number of seconds of all the calls made in the test and total number of errored seconds in the test. While tests are running, these figures along with an indication of the fact that tests are running will be updated in real time at the MAP level. When tests are not running the last known test statistics will be displayed along with an indication that tests are not currently running.

The output which will be directed to the output file device and file name, if defined, will contain a detailed record of each errored call.

Once all the test calls are finished, a summary report will be generated and placed on the output file. This will contain the number of calls made, number of errored calls, number of error free calls and the total number of calls which had no sync (calls were setup but were unable to successfully transmit any data bits due to internal protocol problems).

NTX881AB02 Status: A+M SWITCH BIT ERROR RATE NTCE(REP. BY NTX88

MAINTENANCE	:	
DTU BERT		F6352
SWITCH BER INDICATOR		F6355
SWITCH BER INDICATOR FOR TRUNKS		F6448
IBERT RESOURCE MANAGEMENT		F6599

Package	NTX881AB02 SWITCH BIT ERROR RATE NTCE(REP. BY NTX881AC)
Feature set	MAINTENANCE
Feature	DTU BERT
Feature no	F6352

FEATURE SYNOPSIS

This feature will allow the digital test unit (DTU) to be used as a vehicle for bit error rate testing (BERT).

FEATURE DESCRIPTION

The DTU is a downloadable single line trunk card. Each single physical DTU hardware has two virtual trunk circuit appearances that can operate independently. With the proper firmware downloaded to the DTU using the downloading facility provided by AG0275 (Downloading DTU), it will have the ability to perform various applications on the DMS system (e.g., TTT/TTU Replacement).

For BERT, the DTU does not need to be downloaded with any firmware from the CC. The application firmware for BERT is already existing within the DTU's EPROM.

This feature will provide the CC software support to allow integrate the DTU into the existing DMS BERT facilities such as bit error rate performance (BERP) and trunk bit error rate testing (TRKBERT). The actual integration is provided by another BCS24 feature AG0521. For the description on the above DMS BERT facilities, refer to the feature document AG0360.

The following restrictions and limitations apply to this feature:

- DTU is not supporting TLINK protocol until BCS25.
- The DTU will not be used for datapath testing in BCS24.
- At present, only those DTUs that are connected to MTM are used by this feature.

Ref: AG0275, AG0521, AG0360

Package	NTX881AB02 SWITCH BIT ERROR RATE NTCE(REP. BY NTX881AC)
Feature set	MAINTENANCE
Feature	SWITCH BER INDICATOR
Feature no	F6355

FEATURE SYNOPSIS

The purpose of this feature is to develop a tool which a customer can use to monitor the bit error rate performance of their switch.

FEATURE DESCRIPTION

A test from the BERP level is actually composed of many individual Bit Error Rate Tests (BERT). A single BERT consists of connecting an IBERT either to itself or to a Data Line Card (DLC) and transmitting a known bit pattern. The known bit pattern is reflected back to the IBERT where it is compared to what was sent. Any errors found in the returned bit stream are recorded. The results of all the individual BERTs comprise the result of the BERP test.

The key statistics generated by these test calls will be number of calls made, number of calls in error, total number of bit errors encountered in the test run, total number of seconds of all the calls made in the test and total number of errored seconds in the test. While tests are running, these figures along with an indication of the fact that tests are running will be updated in real time at the MAP level. When tests are not running the last known test statistics will be displayed along with an indication that tests are not currently running.

The output which will be directed to the output file device and file name, if defined, will contain a detailed record of each errored call.

Once all the test calls are finished, a summary report will be generated and placed on the output file. This will contain the number of calls made, number of errored calls, number of error free calls and the total number of calls which had no sync (calls were setup but were unable to successfully transmit any data bits due to internal protocol problems).

Package	NTX881AB02 SWITCH BIT ERROR RATE NTCE(REP. BY NTX881AC)
Feature set	MAINTENANCE
Feature	SWITCH BER INDICATOR FOR TRUNKS
Feature no	F6448

FEATURE SYNOPSIS

This feature is primarily concerned with gating terminal dependent software and movement of bit error rate performance (BERP) code into common to enable the facility to be used in toll offices.

FEATURE DESCRIPTION

This feature will provide the ability to use the digital test unit (DTU) as a tool for BERP at both the local and toll office.

This feature is dependent upon AG0273 - CC support for DTU BERT integration.

AG0274 - CC support for DTU busy, RTS and test.
AG0275 - CC support for DTU downloading.

Ref: AG0521, AG0274, AG0273, AG0275

Package	NTX881AB02 SWITCH BIT ERROR RATE NTCE(REP. BY NTX881AC)
Feature set	MAINTENANCE
Feature	IBERT RESOURCE MANAGEMENT
Feature no	F6599

FEATURE SYNOPSIS

The feature provides resource management for Integrated Bit Error Rate Testers (IBERTs). This feature will provide the ability to reserve an IBERT for use by a specific application or share it among a number of applications.

A method is provided to prevent a foreground IBERT user such as the Line Test Position (LTP) or Trunk Test Position (TTP) to seize an IBERT for a background user such as the Bit Error Rate Performance (BERP) level under certain conditions.

This feature also allows the Digital Test Unit (DTU) to be used as an IBERT at the LTPDATA level for datapath BERT.

FEATURE DESCRIPTION

As of BCS-25, the following applications make use of IBERTs:

- Bit Error Rate Performance
- Line Test Position (BERT command at the LTPDATA sublevel)
- Trunk Test Position (BERT command at the DATA sublevel)
- Automatic Trunk Test

Because a number of such applications can compete for a potentially limited number of IBERTs, situations may arise in which certain applications are unable to obtain an IBERT. It is desirable then to have a method of reserving an IBERT for use by a specific application, or share an IBERT among a subset of all applications. This feature provides such an ability.

To provide this functionality, a means must be introduced to relate a given IBERT to a given application. This will be provided through table control.

Two new tables are introduced:

- FMRESIVN : Facility Maintenance RESource INVENTORY
- FMRESUSE : Facility Maintenance RESource USERS

This feature also allows the LTP to claim a DBERT being used by BERP. This is only permitted if the LTP was unable to obtain another DBERT from those that have been reserved for LTP use and the IBERT being claimed must have been reserved for use by both BERP and the LTP. Control of this in-

errupt facility is provided by an optional parameter on the BERT START command.

Ref: DDOC AG0665FN IBERT RESOURCE MANAGEMENT

NTX881AC02 Status: RTM SWITCH BIT ERROR RATE MAINTENANCE(UPG. O

MAINTENANCE	:	
DTU BERT		F6352
SWITCH BER INDICATOR		F6355
SWITCH BER INDICATOR FOR TRUNKS		F6448
IBERT RESOURCE MANAGEMENT		F6599
BIT ERROR RATE PERFORMANCE COVERAGE ENHANCEMENTS		F6963

Package	NTX881AC02 SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB
Feature set	MAINTENANCE
Feature	DTU BERT
Feature no	F6352

FEATURE SYNOPSIS

This feature will allow the digital test unit (DTU) to be used as a vehicle for bit error rate testing (BERT).

FEATURE DESCRIPTION

The DTU is a downloadable single line trunk card. Each single physical DTU hardware has two virtual trunk circuit appearances that can operate independently. With the proper firmware downloaded to the DTU using the downloading facility provided by AG0275 (Downloading DTU), it will have the ability to perform various applications on the DMS system (e.g., TTT/TTU Replacement).

For BERT, the DTU does not need to be downloaded with any firmware from the CC. The application firmware for BERT is already existing within the DTU's EPROM.

This feature will provide the CC software support to allow integrate the DTU into the existing DMS BERT facilities such as bit error rate performance (BERP) and trunk bit error rate testing (TRKBERT). The actual integration is provided by another BCS24 feature AG0521. For the description on the above DMS BERT facilities, refer to the feature document AG0360.

The following restrictions and limitations apply to this feature:

- DTU is not supporting TLINK protocol until BCS25.
- The DTU will not be used for datapath testing in BCS24.
- At present, only those DTUs that are connected to MTM are used by this feature.

Ref: AG0275, AG0521, AG0360

Package	NTX881AC02 SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB
Feature set	MAINTENANCE
Feature	SWITCH BER INDICATOR
Feature no	F6355

FEATURE SYNOPSIS

The purpose of this feature is to develop a tool which a customer can use to monitor the bit error rate performance of their switch.

FEATURE DESCRIPTION

A test from the BERP level is actually composed of many individual Bit Error Rate Tests (BERT). A single BERT consists of connecting an IBERT either to itself or to a Data Line Card (DLC) and transmitting a known bit pattern. The known bit pattern is reflected back to the IBERT where it is compared to what was sent. Any errors found in the returned bit stream are recorded. The results of all the individual BERTs comprise the result of the BERP test.

The key statistics generated by these test calls will be number of calls made, number of calls in error, total number of bit errors encountered in the test run, total number of seconds of all the calls made in the test and total number of errored seconds in the test. While tests are running, these figures along with an indication of the fact that tests are running will be updated in real time at the MAP level. When tests are not running the last known test statistics will be displayed along with an indication that tests are not currently running.

The output which will be directed to the output file device and file name, if defined, will contain a detailed record of each errored call.

Once all the test calls are finished, a summary report will be generated and placed on the output file. This will contain the number of calls made, number of errored calls, number of error free calls and the total number of calls which had no sync (calls were setup but were unable to successfully transmit any data bits due to internal protocol problems).

Package	NTX881AC02 SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB
Feature set	MAINTENANCE
Feature	SWITCH BER INDICATOR FOR TRUNKS
Feature no	F6448

FEATURE SYNOPSIS

This feature is primarily concerned with gating terminal dependent software and movement of bit error rate performance (BERP) code into common to enable the facility to be used in toll offices.

FEATURE DESCRIPTION

This feature will provide the ability to use the digital test unit (DTU) as a tool for BERP at both the local and toll office.

This feature is dependent upon AG0273 - CC support for DTU BERT integration.

AG0274 - CC support for DTU busy, RTS and test.
AG0275 - CC support for DTU downloading.

Ref: AG0521, AG0274, AG0273, AG0275

Package	NTX881AC02 SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB
Feature set	MAINTENANCE
Feature	IBERT RESOURCE MANAGEMENT
Feature no	F6599

FEATURE SYNOPSIS

The feature provides resource management for Integrated Bit Error Rate Testers (IBERTs). This feature will provide the ability to reserve an IBERT for use by a specific application or share it among a number of applications.

A method is provided to prevent a foreground IBERT user such as the Line Test Position (LTP) or Trunk Test Position (TTP) to seize an IBERT for a background user such as the Bit Error Rate Performance (BERP) level under certain conditions.

This feature also allows the Digital Test Unit (DTU) to be used as an IBERT at the LTPDATA level for datapath BERT.

FEATURE DESCRIPTION

As of BCS-25, the following applications make use of IBERTs:

- Bit Error Rate Performance
- Line Test Position (BERT command at the LTPDATA sublevel)
- Trunk Test Position (BERT command at the DATA sublevel)
- Automatic Trunk Test

Because a number of such applications can compete for a potentially limited number of IBERTs, situations may arise in which certain applications are unable to obtain an IBERT. It is desirable then to have a method of reserving an IBERT for use by a specific application, or share an IBERT among a subset of all applications. This feature provides such an ability.

To provide this functionality, a means must be introduced to relate a given IBERT to a given application. This will be provided through table control.

Two new tables are introduced:

- FMRESIVN : Facility Maintenance RESource INVENTORY
- FMRESUSE : Facility Maintenance RESource USERS

This feature also allows the LTP to claim a DBERT being used by BERP. This is only permitted if the LTP was unable to obtain another DBERT from those that have been reserved for LTP use and the IBERT being claimed must have been reserved for use by both BERP and the LTP. Control of this in-

errupt facility is provided by an optional parameter on the BERT START command.

Ref: DDOC AG0665FN IBERT RESOURCE MANAGEMENT

Package	NTX881AC02 SWITCH BIT ERROR RATE MAINTENANCE(UPG. OF NTX881AB
Feature set	MAINTENANCE
Feature	BIT ERROR RATE PERFORMANCE COVERAGE ENHANCEMENTS
Feature no	F6963

FEATURE SYNOPSIS

This feature increases the coverage of the Bit Error Rate Performance (BERP) tool.

FEATURE DESCRIPTION

By using the line subgroup loop arounds on a Line Concentrating Module (LCM) and a Line Concentrating Module ISDN (LCMI) three advantages are gained.

Any line card may be used to connect to an Intergrated Bit Error Rate Tester (IBERT).

All line subgroups in an LCM or LCMI can be included in a BERP test.

Fewer IBERTs are required to cover an office. One IBERT can sequentially cover all the line subgroups in many LCMS and LCMIs.

This feature expands the BERP to Line Modules (LM).

Ref: FDOC AG0949

NTX882AA03 Status: RTM BIT ERROR RATIO INDICATOR FOR TOLL SWITC

MAINTENANCE	:	
DTU BERT		F6352
SWITCH BER INDICATOR FOR TRUNKS		F6448
IBERT RESOURCE MANAGEMENT		F6599

Package	NTX882AA03 BIT ERROR RATIO INDICATOR FOR TOLL SWITCHES
Feature set	MAINTENANCE
Feature	DTU BERT
Feature no	F6352

FEATURE SYNOPSIS

This feature will allow the digital test unit (DTU) to be used as a vehicle for bit error rate testing (BERT).

FEATURE DESCRIPTION

The DTU is a downloadable single line trunk card. Each single physical DTU hardware has two virtual trunk circuit appearances that can operate independently. With the proper firmware downloaded to the DTU using the downloading facility provided by AG0275 (Downloading DTU), it will have the ability to perform various applications on the DMS system (e.g., TTT/TTU Replacement).

For BERT, the DTU does not need to be downloaded with any firmware from the CC. The application firmware for BERT is already existing within the DTU's EPROM.

This feature will provide the CC software support to allow integrate the DTU into the existing DMS BERT facilities such as bit error rate performance (BERP) and trunk bit error rate testing (TRKBERT). The actual integration is provided by another BCS24 feature AG0521. For the description on the above DMS BERT facilities, refer to the feature document AG0360.

The following restrictions and limitations apply to this feature:

- DTU is not supporting TLINK protocol until BCS25.
- The DTU will not be used for datapath testing in BCS24.
- At present, only those DTUs that are connected to MTM are used by this feature.

Ref: AG0275, AG0521, AG0360

Package	NTX882AA03 BIT ERROR RATIO INDICATOR FOR TOLL SWITCHES
Feature set	MAINTENANCE
Feature	SWITCH BER INDICATOR FOR TRUNKS
Feature no	F6448

FEATURE SYNOPSIS

This feature is primarily concerned with gating terminal dependent software and movement of bit error rate performance (BERP) code into common to enable the facility to be used in toll offices.

FEATURE DESCRIPTION

This feature will provide the ability to use the digital test unit (DTU) as a tool for BERP at both the local and toll office.

This feature is dependent upon AG0273 - CC support for DTU BERT integration.

AG0274 - CC support for DTU busy, RTS and test.
AG0275 - CC support for DTU downloading.

Ref: AG0521, AG0274, AG0273, AG0275

Package	NTX882AA03 BIT ERROR RATIO INDICATOR FOR TOLL SWITCHES
Feature set	MAINTENANCE
Feature	IBERT RESOURCE MANAGEMENT
Feature no	F6599

FEATURE SYNOPSIS

The feature provides resource management for Integrated Bit Error Rate Testers (IBERTs). This feature will provide the ability to reserve an IBERT for use by a specific application or share it among a number of applications.

A method is provided to prevent a foreground IBERT user such as the Line Test Position (LTP) or Trunk Test Position (TTP) to seize an IBERT for a background user such as the Bit Error Rate Performance (BERP) level under certain conditions.

This feature also allows the Digital Test Unit (DTU) to be used as an IBERT at the LTPDATA level for datapath BERT.

FEATURE DESCRIPTION

As of BCS-25, the following applications make use of IBERTs:

- Bit Error Rate Performance
- Line Test Position (BERT command at the LTPDATA sublevel)
- Trunk Test Position (BERT command at the DATA sublevel)
- Automatic Trunk Test

Because a number of such applications can compete for a potentially limited number of IBERTs, situations may arise in which certain applications are unable to obtain an IBERT. It is desirable then to have a method of reserving an IBERT for use by a specific application, or share an IBERT among a subset of all applications. This feature provides such an ability.

To provide this functionality, a means must be introduced to relate a given IBERT to a given application. This will be provided through table control.

Two new tables are introduced:

- FMRESIVN : Facility Maintenance RESource INVENTORY
- FMRESUSE : Facility Maintenance RESource USERS

This feature also allows the LTP to claim a DBERT being used by BERP. This is only permitted if the LTP was unable to obtain another DBERT from those that have been reserved for LTP use and the IBERT being claimed must have been reserved for use by both BERP and the LTP. Control of this in-

errupt facility is provided by an optional parameter on the BERT START command.

Ref: DDOC AG0665FN IBERT RESOURCE MANAGEMENT

Package	NTX883AA01 INTER OFFICE TRK BIT ERROR RATE TESTING
Feature set	MAINTENANCE
Feature	BERT FOR TRUNKS
Feature no	F6560

FEATURE SYNOPSIS

This feature provides bit error rate testing (BERT) of digital outgoing and two way trunk circuits to the next digital office. The terminating office must be equipped with the DIALED LOOPBACK on trunks terminating test line. The test can be invoked both on a manual and automatic basis.

BERT provides a means of determining confidence in a digital transmission path by measuring the level of deviation encountered on a received bit pattern from a predefined transmit sequence.

FEATURE DESCRIPTION

This feature can be initiated either manually from the Trunk Test Position (TTP) or automatically from Automatic Trunk Test (ATT) on a scheduled basis.

The automatic test will always require to terminate on the DIALED LOOPBACK on trunks terminating test line.

Manual testing can be invoked to any of the following terminations:

- 1) DIALED LOOPBACK ON TRUNKS terminating test line.
- 2) Termination indicated by called number.
- 3) Preset termination established manually prior to test.

In the case of the test line connection, the terminating office loops back the transmit path to the receive path in the network for the circuit on which the call was received and returns answer signal (see figure below). In other cases, the terminating office should have the termination preset prior to the test or should provide the required termination at time of connection.

The originating office connects test equipment to the circuit under test and sets it up for BERT. The test equipment transmits the test pattern on the trunk circuit transmit path and checks it on its receive path. Any deviation between the transmitted and the received bit pattern is recorded.

At the end of the test, the test results are recorded, connections released, and the circuits idled.

The manual test results are stored in a table which can store a maximum of 500 test results at any one time. The test results can be retrieved and displayed on the screen. When the circuit under BERT test is placed in the control position of the TTP DATA level of the MAP, the test results will be displayed and updated continuously.

The ATT test results are formatted into a log message and sent to the log system.

Ref: DDOC - BERT FOR TRUNKS AG0520

NTX885AA02 Status: A+M SWITCH PATH DIAGNOSTICS (UPG.BY NTX885AB

MAINTENANCE	:	
NETWORK PATH DIAGNOSTICS		F2877
INTEGRITY CHECK TRAFFIC SIMULATOR(ICTS)		F6356
XPM PERIPHERAL BIT ERROR TESTING		F6357

Package	NTX885AA02 SWITCH PATH DIAGNOSTICS (UPG.BY NTX885AB)
Feature set	MAINTENANCE
Feature	NETWORK PATH DIAGNOSTICS
Feature no	F2877

FEATURE SYNOPSIS

This feature will provide a new facility that will allow the user to perform fault isolation/verification on the network component of a speech path. This isolation/verification is performed by allowing the user to specify any valid speech path through the network and a corresponding test to be run on that path.

FEATURE DESCRIPTION

DMS-100 network speech path maintenance is handled by the NET INTEG package accessed at the NET INTEG level of the MAP. For intermittent problems the NET INTEG package provides a set of commands to display the correlations of the counts with respect to various hardware components. From these correlations, an educated estimate of the hardware at fault can be made and the 'suspect' hardware is changed. This feature will provide a means of testing 'suspicions' without changing the hardware. This tool should prove useful for the following activities:

- Tracking down intermittent integrity faults.
- Determining if the network is responsible for errors detected by the 'switch bit error rate indicator' and isolating the fault if the network is responsible.
- Isolating faults on problem paths identified by the 'integrity check traffic simulator' (ICTS).

The testing facility takes the following form:

- a new MAP level, the NETPATH level will be created (accessed from the NET level).
- commands available to the NETPATH level will be provided to define and monitor the progress of a series of user defined tests.
- tests may be specified from the information available from the NET INTEG package and the other features identified above.
- multiple tests may be defined.
- the tests run unattended, and do not tie up a MAP.
- the tests may be run on in-service or out-of-service networks.

This feature will support the following network types:

NT5X13, NT7X27, NT7X40 and NT8X11.

Ref: DDOC AL0154

Package	NTX885AA02 SWITCH PATH DIAGNOSTICS (UPG.BY NTX885AB)
Feature set	MAINTENANCE
Feature	INTEGRITY CHECK TRAFFIC SIMULATOR(ICTS)
Feature no	F6356

FEATURE SYNOPSIS

Integrity check traffic simulator (ICTS) provides a means to identify and correct network integrity problems in the absence of traffic. ICTS sets up a large number of network connections. The peripherals associated with a connection monitor the integrity and parity values transmitted over the connection. Faulty hardware will have the integrity counts incremented against the path data, as the connection is retained on the specified plane. These counts can be accessed through the MAP.

FEATURE DESCRIPTION

The ICTS is a 'resident' software package that performs integrity/PCM parity checking between two end points of a network connection.

The links involved with ICTS connections are set up by the user. These links are marked as available for ICTS use. ICTS works by scanning the set of ICTS links for two available channels. Once the two channels are found, a network connection is made, PCM is established, and integrity is enabled.

Messages are sent to the PMs involved, requesting the start up of integrity scanning. If an integrity or a parity failure occurs, the connection will continue scanning on the original plane.

The connections are left established until a command is performed to take down the connection or the connection does not pass the checks made by the audit process. For an inservice office, all ICTS connections will be cleared once a day. The default clear time is seven AM.

The ICTS tool will use call processing resources to make a path through the network. These calls can be up for an unlimited amount of time.

Ref: DDOC AL0154

Package	NTX885AA02 SWITCH PATH DIAGNOSTICS (UPG.BY NTX885AB)
Feature set	MAINTENANCE
Feature	XPM PERIPHERAL BIT ERROR TESTING
Feature no	F6357

FEATURE SYNOPSIS

This feature is intended to detect and measure PCM bit errors that occur in XPM and LCM/RLCM/ISLM circuit packs.

If bit errors are detected in these circuit packs, this feature isolates the scope of the problem to a small set of cards. In addition, the XBERT provides a facility for commissioning DS1/PCM30 links and trunks that have been physically looped back at the remote end without the use of a remote node.

FEATURE DESCRIPTION

XBERT can be supported by the following XPM types: LTC, LGC/ILGC, DTC, RCC, IAC. The XBERT diagnostic supports six separate tests that are capable of testing different hardware components in the peripheral speech/data paths. The tests are as follows:

XPMINT, XPMPSL, XPMPC, XPMBIC, XPMHLP and ISOLATE.

For accurate fault detection tests, each of the above tests must be run on an active in-service XPM units.

XBERT is designed to be a fault detection and isolation tool. It must be emphasized that XBERT should not be used as a tool for providing accurate bit error ratio assessments. It does not use the CCITT standard test patterns in its test procedure. Instead, it uses XPM tone PCM to provide the 64 kbps test bit stream.

After the preliminary hardware presence tests timeswitch (6X44), message card (6X69), XPM p-side interface card (6X48 or 6X50), then the individual XBERT tests are invoked to set up the channel connections for their individual test paths. Once the test path has been set up, XBERT passes data through the looped test path and verifies it as it comes through the loop. This data verification continues for a user specified length of time (up to nine hours).

NTX885AB01 Status: RTM SWITCH PATH DIAGNOSTICS (UPG. OF NTX885A

MAINTENANCE	:	
SCHEDULED TESTING OF DMS NETWORK		F2876
NETWORK PATH DIAGNOSTICS		F2877
INTEGRITY CHECK TRAFFIC SIMULATOR(ICTS)		F6356
XPM PERIPHERAL BIT ERROR TESTING		F6357

Package	NTX885AB01 SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA)
Feature set	MAINTENANCE
Feature	SCHEDULED TESTING OF DMS NETWORK
Feature no	F2876

FEATURE SYNOPSIS

This feature provides the ability to perform a scheduled test of the DMS-100 'Network Fabric'. The Network Fabric refers to the call paths through the network modules of the switch. Testing is conducted in the absence of live traffic, is non-disruptive and requires no manual intervention.

FEATURE DESCRIPTION

The testing provided by this feature utilizes the existing Integrity Check Traffic Simulator (ICTS) package. (The ICTS approach is to establish a series of connections through the network and perform integrity/parity checking in a controlled manner.) Highlights of this feature include:

- nightly 4-hour schedule of link and junctor port testing
- all link and junctor channels tested within three nights or less
- manual start/resume/stop control option
- networks remain in-service during testing
- start time selectable by office parameter
- current status or nightly log reports available
- problem call paths are identified and isolated for further diagnosis.

This feature integrates into the network maintenance system with the following interactions:

- Integrity faults detected are correlated by the Network Integrity Package (NETINTEG).
- Faulty paths are stored in a buffer that is accessible by the Network Path Test Tool (NETPATH) package for fault isolation.

Ref: FDOC AL0153

Package	NTX885AB01 SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA)
Feature set	MAINTENANCE
Feature	NETWORK PATH DIAGNOSTICS
Feature no	F2877

FEATURE SYNOPSIS

This feature will provide a new facility that will allow the user to perform fault isolation/verification on the network component of a speech path. This isolation/verification is performed by allowing the user to specify any valid speech path through the network and a corresponding test to be run on that path.

FEATURE DESCRIPTION

DMS-100 network speech path maintenance is handled by the NET INTEG package accessed at the NET INTEG level of the MAP. For intermittent problems the NET INTEG package provides a set of commands to display the correlations of the counts with respect to various hardware components. From these correlations, an educated estimate of the hardware at fault can be made and the 'suspect' hardware is changed. This feature will provide a means of testing 'suspicions' without changing the hardware. This tool should prove useful for the following activities:

- Tracking down intermittent integrity faults.
- Determining if the network is responsible for errors detected by the 'switch bit error rate indicator' and isolating the fault if the network is responsible.
- Isolating faults on problem paths identified by the 'integrity check traffic simulator' (ICTS).

The testing facility takes the following form:

- a new MAP level, the NETPATH level will be created (accessed from the NET level).
- commands available to the NETPATH level will be provided to define and monitor the progress of a series of user defined tests.
- tests may be specified from the information available from the NET INTEG package and the other features identified above.
- multiple tests may be defined.
- the tests run unattended, and do not tie up a MAP.
- the tests may be run on in-service or out-of-service networks.

This feature will support the following network types:

NT5X13, NT7X27, NT7X40 and NT8X11.

Ref: DDOC AL0154

Package	NTX885AB01 SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA)
Feature set	MAINTENANCE
Feature	INTEGRITY CHECK TRAFFIC SIMULATOR(ICTS)
Feature no	F6356

FEATURE SYNOPSIS

Integrity check traffic simulator (ICTS) provides a means to identify and correct network integrity problems in the absence of traffic. ICTS sets up a large number of network connections. The peripherals associated with a connection monitor the integrity and parity values transmitted over the connection. Faulty hardware will have the integrity counts incremented against the path data, as the connection is retained on the specified plane. These counts can be accessed through the MAP.

FEATURE DESCRIPTION

The ICTS is a 'resident' software package that performs integrity/PCM parity checking between two end points of a network connection.

The links involved with ICTS connections are set up by the user. These links are marked as available for ICTS use. ICTS works by scanning the set of ICTS links for two available channels. Once the two channels are found, a network connection is made, PCM is established, and integrity is enabled.

Messages are sent to the PMs involved, requesting the start up of integrity scanning. If an integrity or a parity failure occurs, the connection will continue scanning on the original plane.

The connections are left established until a command is performed to take down the connection or the connection does not pass the checks made by the audit process. For an inservice office, all ICTS connections will be cleared once a day. The default clear time is seven AM.

The ICTS tool will use call processing resources to make a path through the network. These calls can be up for an unlimited amount of time.

Ref: DDOC AL0154

Package	NTX885AB01 SWITCH PATH DIAGNOSTICS (UPG. OF NTX885AA)
Feature set	MAINTENANCE
Feature	XPM PERIPHERAL BIT ERROR TESTING
Feature no	F6357

FEATURE SYNOPSIS

This feature is intended to detect and measure PCM bit errors that occur in XPM and LCM/RLCM/ISLM circuit packs.

If bit errors are detected in these circuit packs, this feature isolates the scope of the problem to a small set of cards. In addition, the XBERT provides a facility for commissioning DS1/PCM30 links and trunks that have been physically looped back at the remote end without the use of a remote node.

FEATURE DESCRIPTION

XBERT can be supported by the following XPM types: LTC, LGC/ILGC, DTC, RCC, IAC. The XBERT diagnostic supports six separate tests that are capable of testing different hardware components in the peripheral speech/data paths. The tests are as follows:

XPMINT, XPMP SL, XPM PCC, XPM BIC, XPM HLP and ISOLATE.

For accurate fault detection tests, each of the above tests must be run on an active in-service XPM units.

XBERT is designed to be a fault detection and isolation tool. It must be emphasized that XBERT should not be used as a tool for providing accurate bit error ratio assessments. It does not use the CCITT standard test patterns in its test procedure. Instead, it uses XPM tone PCM to provide the 64 kbps test bit stream.

After the preliminary hardware presence tests timeswitch (6X44), message card (6X69), XPM p-side interface card (6X48 or 6X50), then the individual XBERT tests are invoked to set up the channel connections for their individual test paths. Once the test path has been set up, XBERT passes data through the looped test path and verifies it as it comes through the loop. This data verification continues for a user specified length of time (up to nine hours).

Package	NTX888AA01 EAOSS
Feature set	EAE0 SIGNALLING
Feature	EAE0 EXCHANGE ACCESS OPERATOR SERVICES SIGNALLING
Feature no	F2960

FEATURE SYNOPSIS

This feature provides the operator services system (OSS) with all the information necessary to process calls arriving on a single combined trunk group. This trunk group may contain calls requiring any subset or all of the operating company (OC) interlata/international carriers (IC/INC) toll and assistance (TA), OC directory assistance (DA), OC intercept, OC and IC/INC new services, and OC and IC/INC direct distance dialing (DDD).

FEATURE DESCRIPTION

The purpose of this feature is to enable the OC to route different types of traffic over the same trunk group. In particular, to enable the OC to combine operator traffic with non-operator traffic on the same trunk group. OP trunk groups provide this capability. Changes to the existing multi frequency (MF) signaling arrangements between an EAE0 and an AT are required to accomplish this.

The first change is that an OSS calls to the AT associated with an OC OSS an ST' (ST prime) is signaled on the first set of digits (KP+PZZ+XXX+ST') to indicate that OC OSS processing is required on the call. Other calls will be signaled with an ST.

The KP signals of the ANI sequence are also modified by this feature. The following explains their meaning:

KP Rotary dial station - customer did not dial 10XXX
 KP' rotary dial station - customer dialed 10XXX
 KP'' DTMF station - customer did not dial 10XXX
 KP''' DTMF station - customer dialed 10XXX

To realize these additional indications, two new boolean fields are added to table OCCINFO:

DTMIND indicates whether or not the IC wishes to have rotary dial DTMF indication on OSS calls routed directly to the IC.

OPSERV indicates whether or not OC OSS processing is required on OSS calls where the IC is explicitly dialed (ie, 10XXX, OO calls).

Also in table TRGRP for OP trunks the field DBLANIDG (double ANI info digits) is replaced with field EA (a boolean) which indicates whether or not EA signaling (and therefore double ANI info digits) is being used on the trunk. If {Yes', then two other new fields have to be set for OP trunk groups:

EAOSS which indicates whether or not EAOSS signaling is required on the trunk, and

RTEVIAAT which indicates whether or not the trunk is to be used to route calls to an AT associated with OC OSS.

To prevent a trouble condition on a call requiring the hold function from holding a line out of service for an extended period, timing is provided when the line goes on hook but the IC is in the off hook condition. If the line remains on hook and neither an on hook nor an expanded inbaud signal is received from the IC within this timeout (1-4 minutes), the connection is released and a TRK121 log report is produced.

A new conditional route is added to enable the OC to route 10XXX calls differently from non-10XXX dialed calls.

Ref: GFX186AA, GFD-EAEO, BR0633 DDOC

NTX891AA01 Status: RTM TOPS - EXCHANGE ACCESS OPR SERV SIG

SWITCHING AND TRANSLATION :
TOPS - EXCHANGE ACCESS OPERATOR SERVICES SIGNALLING F2959

Package	NTX891AA01 TOPS - EXCHANGE ACCESS OPR SERV SIG
Feature set	SWITCHING AND TRANSLATION
Feature	TOPS - EXCHANGE ACCESS OPERATOR SERVICES SIGNALLIN
Feature no	F2959

FEATURE SYNOPSIS

The feature "TOPS - Exchange Access Operator Services System Signaling" (EAOSS) provides the ability for a TOPS office to receive feature group D operator services signalling from an EAEO (equal access end office). This signaling also provides all the information necessary to process calls arriving on a single combined trunk group carrying 1 plus and 0 plus traffic.

FEATURE DESCRIPTION

This feature provides:

- Send all types of operator and non-operator traffic on the same trunk group(s) from an end office.
- Receive carrier information sent from the end office.
- Receive indication of call origination from a DTMF or a rotary dial station in all cases regardless of the carrier pic'd.
- Allow the optional indication of operator involvement by altering the double ANI digits sent to the IC.
- Allow telco OCC processing for non-presubscriber customer.

The new signalling type of "EAOSSIC" is to be used only by offices that need to ignore first stage, all other offices to use EOASS signaling.

A new field has been added for ATC trunk groups - OSIND is Y/N which indicates ani id digits charged to 34.

Ref: AF0719

NTX892AA03

Status: LTD MPC MULTILINK MANAGEMENT

MPC

:

MPC-OM GROUP DEFINITION/COLLECTION FOR MPCFAST SUBSYS

F6998

LINK ENHANCEMENTS FOR MPC MULTILINK MANAGEMENT

F7244

Package	NTX892AA03 MPC MULTILINK MANAGEMENT
Feature set	MPC
Feature	MPC-OM GROUP DEFINITION/COLLECTION FOR MPCFAST SUB
Feature no	F6998

FEATURE SYNOPSIS

This feature adds a new Operational Measurement (OM) group, MPCFASTA, and implements collection of data for registers in the group. MPCFASTA measurements are specifically applicable to users of the Multi-Protocol Controller Multilink Management package.

FEATURE DESCRIPTION

The MPCFASTA OM group contains one tuple for each application datafilled in Table MPCFASTA. Four registers are maintained per application. These registers collect indications of data traffic generated by the application, and of the stability of data links being used.

Each OM tuple in the MPCFASTA group has an application name key. These correspond to applications datafilled in Table MPCFASTA. In addition, each tuple has three information fields which may be useful when analyzing the OM register data.

Ref: FDOC AF1153

Package	NTX892AA03 MPC MULTILINK MANAGEMENT
Feature set	MPC
Feature	LINK ENHANCEMENTS FOR MPC MULTILINK MANAGEMENT
Feature no	F7244

Synopsis

This feature supports applications such as Voice Service Node and Automatic Alternate Billing Services (AABS) in the Multi-Protocol Controller(MPC) multi-link management environment. Logical link sets have been added to allow proper message routing to multiple voice service nodes, thus providing improved services for application users. Additional error controls are also available for link faults, which increases reliability.

Implementation

New Table MPCLSET allows MLCS (MPC number, link number, conversation number (defining the logical link) to be grouped into link sets.

MLCs are datafilled in Table MPCFASTA. Datafill new field RECOVERY with value 'ENHANCED' to utilize this feature.

Log MPC299 is generated if datafill is inconsistent between Tables MPCFASTA and MPCLSET at DMS RESTART.

The following feature packages are necessary for this feature to operate:

NTX000AA Bilge
NTX001AA Common Basic
NTX273AA Multi-Protocol Controller BX.25

Activation and Deactivation

No end-user action is required to implement this feature.

Interactions

This feature is required in order to use AABS.

This feature is compatible with existing MPCFAST applications AOSSVR and TOPSVR.

Limitations

The datafill in MPCLSET must be removed before the corresponding datafill in MPCFASTA.

There can be a maximum of 16 link-sets per application.

Applications using link-sets must use the appropriate MPC link-set software routines for performing output.

If links are datafilled in MPCFASTA, but not in MPCLSET, they links are not available for application use.

Reference: FDOC AF1516

Package	NTX898AA01 VARIABLE SPEED CALL ACCESS CODE - IBN
Feature set	STATION FEATURES
Feature	VARIABLE SPEED CALL ACCESS CODE
Feature no	F2739

FEATURE SYNOPSIS

The purpose of this feature is to permit IBN speed call users to dial speed call access codes and speed call abbreviation codes without using the ³ prefix. The capability provided by this feature is optional and is obtained by adding option AMBISC on a customer group basis in table CUSTSTN.

FEATURE DESCRIPTION

The presence of this optional feature in a DMS-100 switch with the necessary software packages and datafill permits IBN speed call users to dial speed call access codes (74 & 75) and speed call abbreviation codes (2-7 & 20-69) without using the ³ prefix.

This feature allows an IBN subscriber to access members of a speed call short (SCS) list by dialing a SCS abbreviation code in the range 2 to 7. No IBNXLA translation data is required to provide this capability. Each line in a customer group with the CUSTSTN option AMBISC has this capability. SCS users do not have access to abbreviation codes 0, 1, 8 and 9. An attempt to program these calls results in Negative Acknowledgement (NACK) treatment. Attempts at accessing these calls results in an attempt to terminate on the digit dialed based on IBNXLA translation data. It should also be noted that flash feature translator, ncos feature translator, and customer feature translator data in table IBNXLA permitting subscribers have the option of dialling ³ 2 to ³ 7 to access SCS calls 2 through 7.

This feature allows an IBN subscriber to access members of a speed call long (SCL) list by dialling a SCL abbreviation code in the range 20 to 69. No IBNXLA translation data is required to provide this capability. Each line in a customer group with the CUSTSTN option AMBISC has this capability. SCL users do not have access to abbreviation codes 00-19. An attempt to program these calls results in NACK treatment. Attempts at accessing these calls results in an attempt to terminate on the digit dialled based on IBNXLA translation data. It should also be noted that flash feature translator, ncos feature translator, and customer feature translator data in table IBNXLA permitting, subscriber have the option of dialling ³ 20 to ³ 69 to access SCL calls 20 through 69.

When the optional AMBISC feature is active the speed call access codes (74 and 75) and abbreviation codes (2-7 & 20-69) override any matching flash preliminary translator, ncos preliminary translator, customer preliminary translator and customer main translator data in table IBNXLA.

Package	NTX899AA01 CALL TRANSFER ENHANCEMENTS
Feature set	SERVICES
Feature	CONFIDENTIALITY ALERTING ON CALL TRANSFER
Feature no	F2970

FEATURE SYNOPSIS

This feature will provide a series of distinct warning tones to conferees whenever there are more than two parties connected to a line in conjunction with three way calling/call transfer.

The purpose of the confidential alerting on call transfer is to provide a measure of security to the call transfer feature. This feature prevents a situation where the controlling party can monitor a conversation without the knowledge of the other two parties. Basically, when a three way call is established, if this feature is properly assigned (as is discussed in the feature description section), a warning tone is given to the non-controlling parties to let them know that the controller is still connected to the call. From this point the call is monitored for the controller's disconnect. When this occurs, a second tone is given to the non-controlling parties to notify them of the controller's exit.

FEATURE DESCRIPTION

For this feature, the option name is call transfer warning (CTW). This feature only affects the new three-way calling and call transfer, when CTW is assigned. CTW is assignable on a customer group basis or on a per line basis.

The party who flashes to initiate a three way call is designated as party A (controller). The party to whom A was originally talking before flashing is designated as party B and the add-on party whom A dialled is referred to as party C. If A disconnects, B and C are left in a simple two port call with no 3-port conference bridge (CF3P) included.

"Establishing the 3WC" means that party A has flashed and all three parties are connected to a 3-port conference bridge. At this point, the C party could be in either a talking state or a ringing state.

This feature is responsible for warning the B and C parties in a 3WC that the A party is still connected to the call. When one or both of the non-controlling parties or one or both of their customer groups has the feature assigned the warning and disconnect tones will be given.

Following are descriptions of two cases of the feature's initiation:

Case 1: When a 3WC is established and all parties are in talking state, the warning tone is given immediately.

Case 2: When a 3WC is established and all parties are not in talking state (one party is still ringing), the warning tone is not yet given. After the last party answers, a one-second timer is started. When this timer expires the warning tone is given.

After the warning tone is given (for either case), the call is monitored for the controller's disconnect. When the controller disconnects, the non-controlling parties hear a disconnect notification tone. Following is a list of feature notes and restrictions:

- The tones are given only to the non-controlling parties.
- The feature is invoked only if one or both of the non-controlling parties or one or both of their customer groups has the call transfer warning (CTW) feature assigned.
- If in case 2 one of the three parties disconnects before the one second timer expires, no tones are given.
- If party B or C disconnects after the warning tone, no further monitoring is done.
- If the controller is a POTS line, the feature is not invoked.
- If party A disconnects and a transfer is not allowed, the disconnect notification tone is not given since the call is going down anyway.

The warning tone is 400 msec of audible ringback tone. The disconnect notification tone is 400 msec of dial tone. This is consistent with other conferencing features such as preset conference and flexible station controlled conference.

Feature Interactions:

This feature does not affect the 3WC or call transfer features except that the tones are given in the case of a 3WC where the call transfer warning option is assigned. No other features or feature interactions are affected.

Failure Conditions:

If one of the tones cannot be given for some reason (tone failure, resources unavailable, etc.), the call continues as if the tone was successful.

The CTW option cannot be assigned to POTS lines.

If the timer for the one-second wait in case 2 cannot be done for some reason, the warning tone is given immediately.

Ref: FDOC AD0728

NTX901AA17 Status: RTM LOCAL FEATURES I

RINGING	:		
RINGBACK			F0018
FREQUENCY SELECTIVE	DECIMONIC		F0019
BRIDGED RINGING			F0020
ADMINISTRATION	:		
OPERATIONAL MEASUREMENT (BASIC LOCAL)			F0025
RINGING	:		
GROUNDED RINGING			F0035
SWITCHING AND TRANSLATION	:		
EXTENDED AREA SERVICE			F0036
INTERFACES	:		
INTERFACE WITH	#3 LTC		F0054
TONES	:		
ROH TONES			F0111
BUSINESS SERVICES	:		
HOTEL/MOTEL	MANUAL PBX SERVICE		F0113
INTERFACES	:		
INTERFACE WITH	PORTA SYSTEM LINE TEST UNIT		F0143
TONES	:		
CLASS OF SERVICE TONES			F0145
INTERFACES	:		
INTERFACE WITH	AE #21 LTD		F0164
RINGING	:		
BRIDGED AND GROUNDED RINGERS ON SAME LINE			F0165
COIN LINE SERVICE	:		
COIN STUCK & COIN PRESENT/ABSENT DETECTION			F0167
MAINTENANCE AND TESTING	:		
DIAL TONE SPEED MEASUREMENT			F0168
NUMBER IDENTIFICATION/CHARGING	:		
ONI	4-PARTY		F0169
TYPES OF LINES	:		
FOREIGN EXCHANGE LINES	ANALOG		F0171
INTERFACES	:		
INTERFACE WITH	#14 LTD - VIA SARTS		F0173
INTERFACE WITH	AE #1 LTD		F0174
INTERFACE WITH	PULSAR II IMTS		F0175
ADMINISTRATION	:		
LINE DATA BASE QUERIES			F0176
SWITCHING AND TRANSLATION	:		
INFORMATION AND REPAIR ROUTED TO KEY SYSTEM			F0181
MAINTENANCE AND TESTING	:		
THRESHOLDING ON PERMANENT SIGNAL (LINE CABLE FAILURE)			F0182
NUMBER IDENTIFICATION/CHARGING	:		
VOICE NUMBER VERIFICATION			F0183
ADMINISTRATION	:		
PURPLE BOX WIRE TAP			F0185
RECEIVER OFF-HOOK TREATMENT			F0186
BUSINESS SERVICES	:		
HUNTING	DIRECTORY NUMBERS		F0187

COIN LINE SERVICE	:		
COIN CONTROL	+ OR - 130V TO COIN STATION		F0188
COIN CONTROL	INBAND SIGNALLING (AC)		F0189
COIN CONTROL	MULTIWINK		F0190
PREPAY COIN FIRST			F0191
PREPAY DIALTONE FIRST			F0192
COIN CONTROL	THIRD WIRE		F0193
COIN CONTROL	TIP AND RING		F0194
SEMI-POST PAY			F0196
VARIABLE INITIAL RATE (VIR) IDENT. (COIN BOX FEATURE)			F0197
0 AND N11 CALL TREATMENT			F0198
CUSTOMER SERVICE	:		
DENIED ORIGINATING			F0199
DENIED SERVICE			F0200
DENIED TERMINATING			F0201
OFFICE DEPENDANT CALL DISCONNECT TREATMENT			F0202
FREE NUMBER TERMINATING			F0203
DIALING AND DIALING PLAN	:		
REVERTIVE CALLS	7 DIGIT DIALLED (2-PARTY)		F0204
REVERTIVE CALLS	7 DIGITS DIALLED (MULTI-PARTY)		F0205
INTERFACES	:		
INTERFACE WITH	#14 LTD - DIRECT		F0206
INTERFACE WITH BADGER 612A			F0208
INTERFACE WITH	DACS		F0209
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Package	NTX901AA17 LOCAL FEATURES I
Feature set	RINGING
Feature	RINGBACK
Feature no	F0018

DESCRIPTION

Coded ringing is used to ring multiparty lines. 5 ringing codes are provided and up to 10 parties (5 on tip and 5 on ring side of line) can be served.

The application of coded ringing to a specific called party results in _a_l_l parties on the same side of the line being rung (i.e. coded ringing is not _s_e_l_e_c_t_i_v_e). Parties on the other side of the line remain silent.

REFERENCES

NTP 297-1001-109

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	RINGING		
Feature	FREQUENCY SELECTIVE	DECIMONIC	
Feature no	F0019		

DESCRIPTION

FREQUENCY RINGING IS USED BY TELCOS FOR SINGLE, 2 PARTY AND MULTI-PARTY SERVICE. FOR MULTIPARTY OPERATION, THE MAXIMUM NUMBER OF PARTIES ALLOWED IS 8. IN THE FREQUENCY RINGING MODE OF OPERATION, EACH RINGER IS TUNED TO A SPECIFIC FREQUENCY SUCH THAT THE APPLICATION OF RINGING TO THE CALLED PARTY RESULTS ONLY IN THE SPECIFIC PARTY CALLED BEING RUNG.

THE PARTICULAR FREQUENCIES USED IN THE VARIOUS TYPES OF FREQUENCY RINGING ARE:

- 1) 16 2/3, 25, 33 1/3, 50, 66 2/3 HZ - HARMONIC RINGING
- 2A) 20, 30, 42, 54 66 HZ - SYNCHROMONIC RINGING (20 HZ BASE)
- 2B) 16 2/3, 30, 42, 54 HZ - SYNCHROMONIC RINGING (16 HZ BASE)
- 3) 20, 30, 40, 50, 60 HZ - DECIMONIC RINGING

THE TYPE OF FREQUENCY RINGING IS TELCO SPECIFIABLE.

Package NTX901AA17 LOCAL FEATURES I
 Feature set RINGING
 Feature BRIDGED RINGING
 Feature no F0020

DESCRIPTION

Bridged ringing is the type of ringing where the ringer is connected between tip and ring. Grounded ringing is the type where the ringer is connected between tip and ground or ring and ground. This is also called divided ringing.

The following is the association between ringing and line card.

LINE TYPE ----	RINGING -----	RINGERS RING	TYPE C	LINE CRD FOR F S -----
1FR PRIMARY FREQUENCY or 20 Hz	B/D	A(1)	A	A
2FR PRIMARY FREQUENCY or 20 Hz	D	A(1)	B	A
2FR FREQUENCY	B	-	A	-
4FR FREQUENCY/SUPERIMPOSED	D	-	B	B
4FR FREQUENCY	B	-	A	-
8FR ANY	D	B	B	B
10FR	CODED	D	B	- -

Line Cards are as follows:

A = NT2X17AB
 B = NT2X18AC or AD

Ring types are as follows:

C = coded ringing
 F = frequency ringing
 S = superimposed ringing

The ring code must be equal to 0.

B = Bridge ringing
 D = Divided ringing

Package	NTX901AA17 LOCAL FEATURES I
Feature set	ADMINISTRATION
Feature	OPERATIONAL MEASUREMENT (BASIC LOCAL)
Feature no	F0025

DESCRIPTION

Operational measurements for basic local include:

Dial tone speed measurement results line module maintenance measurements on a per office basis:

- errors
- system made busy usage
- man made busy usage

Line module traffic information:

- Incoming PC
- Originating PC br;- Usage
- Overflows

Traffic flow information for traffic originating and terminating on lines (on a per office basis).

REFERENCE

NTP 297-1001-114

Package	NTX901AA17 LOCAL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	EXTENDED AREA SERVICE
Feature no	F0036

DESCRIPTION

This is an extension of a major exchange area to include other surrounding exchange areas. Toll-free dialing is permitted within the extended area in return for metropolitan area rates.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TONES
Feature	ROH TONES
Feature no	F0111

DESCRIPTION

ROH tone in DMS is a combination of 4 frequencies: 1400 Hz, 2050 Hz, 2450 Hz and 2600 Hz with equal tone-on and tone-off (100 msec) at -6.25 dBm per frequency.

Unlike the other DMS tones (busy, dial, no circuit tones) which come directly from the Peripheral Modules, the ROH tone is switched through the network. ROH circuit is housed in the MTM and is provisioned and engineered as a service circuit.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	BUSINESS SERVICES		
Feature	HOTEL/MOTEL	MANUAL PBX SERVICE	
Feature no	F0113		

DESCRIPTION

Hotel rooms are equipped with extensions from one of a variety of Manual PBX systems.

Trunk lines from the PBX to the CO are furnished at Messate Rate.

Guest room message registers are not available with this service.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TONES
Feature	CLASS OF SERVICE TONES
Feature no	F0145

DESCRIPTION

Class of service tones are used at switchboards to indicate the class of service of the calling subscribers when more than one class is served by the trunk group.

The trunks to the switchboard are used either to concentrate traffic from more than one originating line class of service or to tandem traffic from other end office (Rural or Urban). The REA application requires that the identifying tone on calls from coin lines by an uninterrupted low tone and persist for 500ms. The proposed three tones to be used are High, Low and No-Tone as described below:

(i) Class of Service - High Tone (Coin)

Nominal Frequency: 480 Hz

Nominal Tone Level: -24dBm0 per frequency

Interruption: Steady

(ii) Class of Service - Low Tone (Non-Coin)

Nominal Frequency: 480 + 620 Hz

Nominal Tone Level: -24dBm0 per frequency

Interruption: Steady

(iii) Class of Service - No Tone (Non-Coin)

The above tones should be selectable on a trunk group basis by DMO or data fillable in the Tone Tables Assignment. Those tones are available from Tone Cards in the TM and DCM.

The tone will be repeated in the event that the operator has disconnected and then reanswered.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	INTERFACES		
Feature	INTERFACE WITH	AE #21 LTD	
Feature no	F0164		

DESCRIPTION

The DMS interface with the AE-21 Test Desk is via the NT3X04AA Incoming Test Trunk. The following options are required for the test desk. (Refer to AE-21 SD H8 5275C)

- 1) Local Access : Fig. 1 or 15 + Fig. 2
- 2) Remote Access: Fig. 1 or 15, Fig. 2 + 19 + Wiring TG

REFERENCE

AE.21 SD H8 5275C

Package	NTX901AA17 LOCAL FEATURES I
Feature set	RINGING
Feature	BRIDGED AND GROUNDED RINGERS ON SAME LINE
Feature no	F0165

DESCRIPTION

The feature allows bridged (i.e. ringer connected between tip and ring) and grounded (i.e. ringer connected between tip and ground or ring and ground) ringers on the same line for 2 party and multiparty service.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	COIN LINE SERVICE
Feature	COIN STUCK & COIN PRESENT/ABSENT DETECTION
Feature no	F0167

DESCRIPTION

Coin Present Test

A coin present signal is forwarded to the CO when a coin box is off-hook and a coin is resting in the hopper (i.e., 1000 ohm ground on tip when coin is present).

Stuck Coin Test

Two applications of coin disposal potential are preformed in an attempt to dispose of the coin before a 'stuck coin' condition is recognized.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	DIAL TONE SPEED MEASUREMENT
Feature no	F0168

DESCRIPTION

Dial tone speed (DTS) is measured on a per office basis and is split to provide DP and DIGITONE measurements.

Every 4 secs two idle lines are selected and the DTS test instructions sent out to the selected line modules (LM). The selection algorithms cover all, LM's and the different line types.

The number of test originations, and test organisations experiencing greater than three seconds dial tone delay are recorded in operational measurements.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	ONI	4-PARTY	
Feature no	F0169		

DESCRIPTION

This feature permits the calling number of any party of a 4-party line to be identified manually (ONI) for billing purposes.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	TYPES OF LINES		
Feature	FOREIGN EXCHANGE LINES	ANALOG	
Feature no	F0171		

DESCRIPTION

Foreign exchange (FX) service permits an individual subscriber to appear as a local subscriber in any area other than that normally serving the geographical area in which the subscriber is located. The service is provided over external facilities connected to the DMS line card.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	INTERFACES		
Feature	INTERFACE WITH	#14 LTD - VIA SARTS	
Feature no	F0173		

DESCRIPTION

The Simplified Access Remote Testing System (SARTS) allows line testing from a #14 LTD or Independent Test Console beyond the normal DC test range of 1500 ohms.

Basically, the SARTS system converts test desk key operations to AC tones, transmits these over facilities, then reconverts to C at the office for operation with test circuitry there.

The SARTS Test System is compatible with DMS-100 Family provided the necessary external voltage and tone supplies are provided.

The connecting circuits are:

NEAR END (TEST CENTRE) - SD99309-01
- SD99310-01

FAR END (DMS) - SD99308 I/F with NT2X17AB
(required when facilities non-dedicated i.e. DDD network)
- SD99311-01 I/F with NT2X90AB

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	INTERFACES		
Feature	INTERFACE WITH	AE #1 LTD	
Feature no	F0174		

DESCRIPTION

To interface with AECO #1 LTD, the following circuits are used:

- a) NT2X90AB trunk circuit
- b) 5X90 Auxiliary outgoing test circuit to A.E. LTD

With this arrangement, it is possible for a repair man to call the A.E. test desk from the subscriber's premises using the inspector trunk (H83128). The same connection can be used to test metallicly to the station.

Package NTX901AA17 LOCAL FEATURES I
Feature set ADMINISTRATION
Feature LINE DATA BASE QUERIES
Feature no F0176

DESCRIPTION

THE FOLLOWING INFORMATION IS AVAILABLE FROM THE DMS DATA BASE: - WORKING
DIRECTORY NUMBERS PLUS ASSOCIATED LINE EQUIPMENT
(TOTAL OR RANGE)

- DIRECTORY NUMBERS ON MACHINE INTERCEPT (TOTAL OR RANGE)
- DIRECTORY NUMBERS ON OPERATOR INTERCEPT (TOTAL OR RANGE) - DIRECTORY
NUMBERS ON SUSPENDED SERVICE (TOTAL OR RANGE)
- DIRECTORY NUMBERS ON PLUG-UP (TOTAL OR RANGE)
- ALL DATA ASSOCIATED WITH ANY SPECIFIC DIRECTORY NUMBER
- DIRECTORY NUMBERS BY CLASS OF SERVICE (TOTAL OR RANGE)
- WORKING LINES PER LM PLUS ASSOCIATED BILLING NUMBER (TOTAL OR
BY CLASS OF SERVICE)
- UNASSIGNED LINE TERMINATIONS PER LM (INCLUDES EQUIPPED AND NON
EQUIPPED TERMINATIONS)
- SPARE LINE CARD SLOTS PER LM (TOTAL OR QUANTITY)
- ALL DATA ASSOCIATED WITH A SPECIFIC LINE
- LINE HUNT GROUP OPTIONS AND SEQUENCE OF HUNTING
- MESSAGE REGISTER CONTENTS (ONE OR ALL)
- INWATS REGISTER CONTENTS (ONE OR ALL)
- OVERFLOW REGISTER CONTENTS (ONE OR ALL)

Package	NTX901AA17 LOCAL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	INFORMATION AND REPAIR ROUTED TO KEY SYSTEM
Feature no	F0181

DESCRIPTION

In some instances N11 features are served from lines in the office in which the call originates. The N11 code is therefore translated into a line appearance rather than a trunk appearance by the DMS machine.

REFERENCE

RFF 154

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	THRESHOLDING ON PERMANENT SIGNAL (LINE CABLE FAILU
Feature no	F0182

DESCRIPTION

This feature is used as a maintenance aid. It alerts maintenance personnel of the presence of abnormal line conditions (e.g., line cable failures), resulting in an excessive number of simultaneous permanent signals.

Whenever a permanent signal condition is encountered in a line, the system will:

- 1) Output a message to the log system (to enable fault isolation).
- 2) Increment a counter (corresponding to the number of lines in permanent signal state within the office). If the count is greater than a pre-defined threshold, a Major Alarm will be given and an output message should be routed to the log system.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	ADMINISTRATION
Feature	PURPLE BOX WIRE TAP
Feature no	F0185

DESCRIPTION

The purple box wire tap fraud depends upon the calling party being able to maintain the connection to the called party after the called party has gone on-hook. To prevent this type of fraud DMS will employ both timed called party clear and calling party clear connection release on normal (i.e., non-operator) types of call.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	ADMINISTRATION
Feature	RECEIVER OFF-HOOK TREATMENT
Feature no	F0186

DESCRIPTION

ROH tone consists of 1400 + 2050 + 2450 + 2600 Hz, with equal tone-on and tone-off (100 msec) intervals. ROH tone may be applied to lines in an attempt to alert subscribers of permanent signal conditions caused by receivers being left off the hook.

Package	NTX901AA17 LOCAL FEATURES I	
Feature set	BUSINESS SERVICES	
Feature	HUNTING	DIRECTORY NUMBERS
Feature no	F0187	

DESCRIPTION

Each line in the hunt group has it's own unique directory number (DN). The hunt group can be accessed by dialing the main number (called Pilot DN) or by dialing the DN of one of the hunt group members. Hunting starts at the number dialed. The number of lines hunted to find an idle line is dependent on the hunting option assigned to the DNH group.

Two options are possible: Circular and Sequential.

If option CIR (Circular hunting) is assigned to the group, all lines in the hunt group will be hunted regardless of the start point of hunting. If CIR is not assigned, the default is Sequential hunting (sometimes called Linear hunting). Sequential hunting starts at the number dialed and ends at the last number in the hunt group. Therefore, if the Pilot DN was not dialed, not all lines will be hunted.

Package	NTX901AA17 LOCAL FEATURES I	
Feature set	COIN LINE SERVICE	
Feature	COIN CONTROL	+ OR - 130V TO COIN
Feature no	F0188	

DESCRIPTION

Coin collect and coin return are accomplished by application of +130 volts (coin collect) or -130 volts (coin return) to tip only or to tip and ring (simplex) of the line to the coin box.

Package	NTX901AA17 LOCAL FEATURES I	
Feature set	COIN LINE SERVICE	
Feature	COIN CONTROL	INBAND SIGNALLING (A
Feature no	F0189	

DESCRIPTION

The following signals are received from the toll office or the operator switchboard/TOPS/TSPS by DMS and the appropriate coin control signal (+130V) is applied to the Coin Station.

- | | |
|-------------------|--|
| a) | Inband signalling |
| Coin collect | 700/1100 Hz |
| Coin return | 1100/1700 Hz |
| Ring back | 700/1700 Hz |
| b) | Third wire |
| Coin collect | +130 v.d.c. on third wire |
| Coin return | -130 v.d.c. on third wire |
| Ring back | +130 v.d.c. on the TIP and ring leads |
| c) | Tip and ring |
| Coin collect | +130 v.d.c. on ring
-48 v.d.c. on tip |
| Coin return | +130 v.d.c. on tip
-48 v.d.c. on ring |
| d) | Multiwink |
| Coin collect | 3 winks |
| Coin return | 4 winks |
| Ring back | 5 winks |
| Operator released | 1 wink |
| Operator attached | 2 winks |

Multiwinks are multiple on-hook signals of 70-130 msec. duration and they are 100-150 msec. apart.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	COIN LINE SERVICE		
Feature	COIN CONTROL	MULTIWINK	
Feature no	F0190		

DESCRIPTION

The following signals are received from the toll office or the operator switchboard/TOPS/TSPS by DMS and the appropriate coin control signal (+130V) is applied to the Coin Station.

Multiwink

Coin collect	3 winks
Coin return	4 winks
Ring back	5 winks
Operator released	1 wink
Operator attached	2 winks

Multiwinks are multiple on-hook signals of 70-130 msec. duration and they are 100-150 msec. apart.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	COIN LINE SERVICE
Feature	PREPAY COIN FIRST
Feature no	F0191

DESCRIPTION

Coin First

A coin is required before dial tone is returned and any dialing can be initiated. Coins are held in suspension until the call matures and are collected when the calling party goes on-hook at the end of the call. The coin is returned if the call is to an operator, free number, or if no connection is established.

Toll calls must be placed via an operator. Local calls are not timed and a flat fixed fee (coin) is collected at the termination of a successful call. In general, this is a ground start line.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	COIN LINE SERVICE
Feature	PREPAY DIALTONE FIRST
Feature no	F0192

DESCRIPTION

This is similar to coin prepay except that dial tone is received on lifting the receiver (off-hook) without coin deposit. Operator or information calls (XII type service code) require no coin deposit. On calls requiring payment, a coin must be deposited prior to dialing. The coin is held in suspension and is collected upon calling party going on-hook at the end of a matured call. Calls which are abandoned or terminated at a free number result in the coin being returned. In general, this is a loop start line.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	COIN LINE SERVICE		
Feature	COIN CONTROL	THIRD WIRE	
Feature no	F0193		

DESCRIPTION

The following signals are received from the toll office or the operator switchboard/TOPS/TSPS by DMS and the appropriate coin control signal (+130V) is applied to the Coin Station.

Third wire

Coin collect	+130 v.d.c. on third wire
Coin return	-130 v.d.c. on third wire
Ring back	+130 v.d.c. on the TIP and ring leads

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	COIN LINE SERVICE		
Feature	COIN CONTROL	TIP AND RING	
Feature no	F0194		

DESCRIPTION

The following signals are received from the toll office or the operator switchboard/TOPS/TSPS by DMS and the appropriate coin control signal (+130V) is applied to the Coin Station.

Tip and ring

Coin collect	+130 v.d.c. on ring
	-48 v.d.c. on tip
Coin return	+130 v.d.c. on tip
	-48 v.d.c. on ring

Package	NTX901AA17 LOCAL FEATURES I
Feature set	COIN LINE SERVICE
Feature	SEMI-POST PAY
Feature no	F0196

DESCRIPTION

Dial tone is returned immediately upon off-hook condition at the coin station and dialing can commence prior to any coin deposit. Calls to operators or free numbers complete successfully with two-way conversation possible, and no coin deposit. All other calls are completed but transmission is blocked and calling party can not be hear until a coin deposit is made. No refund is possible.

Once the connection is established (i.e., upon called party answer) a signal (reversal) is sent from the central office to the coin phone which inhibits transmission from the calling subscriber. Once the calling subscriber deposits a coin, his transmission is automatically restored by the coin phone and conversation can occur.. Semi-post pay lines have no provision for returning coins.

Notes

- 1) No coin presence, coin collect or coin return signals are required.
- 2) Operator and free number calls do not require a coin (i.e., reversal not sent from CO).

Package NTX901AA17 LOCAL FEATURES I
Feature set COIN LINE SERVICE
Feature 0 AND N11 CALL TREATMENT
Feature no F0198

DESCRIPTION

With prepay operation, if a coin subscriber dials "0" or other "free" codes such as "N11", the coin deposit is automatically returned. With dial tone first, no coin is required, but if the subscriber has deposited a coin, it will be returned automatically.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	CUSTOMER SERVICE
Feature	DENIED ORIGINATING
Feature no	F0199

DESCRIPTION

Denied Originating service (DOR) is assigned to any line where the customer may receive calls only. Where a line with this option attempts to originate a call, the line is routed to Originating Suspends Service treatment (ORSS).

Package	NTX901AA17 LOCAL FEATURES I
Feature set	CUSTOMER SERVICE
Feature	DENIED SERVICE
Feature no	F0200

DESCRIPTION

All service is denied to lines with this restriction (SUS). It is normally used to temporarily deny service in cases such as non-payment of bills. Facilities are left in place for re-connection on short notice.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	CUSTOMER SERVICE
Feature	DENIED TERMINATING
Feature no	F0201

DESCRIPTION

Calls cannot be completed to these lines. This feature (DTM) applies to all types of lines, except multi-party lines. However, plant maintenance calls can be completed to lines with this restriction.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	CUSTOMER SERVICE
Feature	OFFICE DEPENDANT CALL DISCONNECT TREATMENT
Feature no	F0202

DESCRIPTION

When the called (or calling) party disconnects and the calling (or called) party remains off-hook, two options which are fillable on a per office basis, are available.

Option 1: - period of silence³
- announcement
- ROH Tone
- line lockout

Option 2: - period of silence³
- dial tone
- announcement
- ROH tone
- line lockout

³ The duration of silence is data fillable.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	CUSTOMER SERVICE
Feature	FREE NUMBER TERMINATING
Feature no	F0203

DESCRIPTION

This feature (FNT) is assigned to a line for which a charge condition is not to be returned on a terminating call. It applies to local and EAS calls only.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	DIALING AND DIALING PLAN		
Feature	REVERTIVE CALLS	7 DIGIT DIALLED (2-P	
Feature no	F0204		

DESCRIPTION

When a 2-party subscriber dials the 7 digit number of the other party on his line, the system recognizes this as a revertive call request and returns busy tone to the calling subscriber. The calling subscriber hangs up. Ringing is applied to the called line, and revertive ringing to the calling line. Ringing is tripped when the called subscriber answers, a signal for the calling subscriber to go off-hook and begin conversation.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	DIALING AND DIALING PLAN		
Feature	REVERTIVE CALLS	7 DIGITS DIALLED (MU	
Feature no	F0205		

DESCRIPTION

When a multiparty subscriber dials the 7 digit number of any party on his line (whether on the same side or on opposite side) the system recognizes this as a revertive call (i.e. both calling and called parties in the same Line Equipment Number LEN) and returns busy tone (Bell Canada Systems) to the calling subscriber. The calling subscriber hangs up within a specified time in order to allow the called party to be rung. Revertive ringing is applied in the case of coded ringing. For more details, refer to revertive ringing feature in the same package.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	INTERFACES		
Feature	INTERFACE WITH	STROMBERG-CARLSON #1	
Feature no	F0210		

DESCRIPTION

Applique circuit for outgoing test trunk to a Stromberg Carlson Test Board.

This applique circuit provides the interface between the outgoing test trunk NT2X90AB and the Stromberg Carlson Outgoing Test Board Incoming Test Circuit S50303 or equivalent.

The supervisory signals from the S.C. Test Board are changed in the applique circuit to suitable signals acceptable to the Outgoing Test Trunk 2X90AB and vice versa.

Once the connection is established via the Metallic Test Access Circuit from the line under test to the S.C. Test Board Test Circuit, the call is under the control of the test board.

For a full explanation of the applique operation, see FD5X66.

REFERENCES

- a) DCD NT5X66 No. 17
- b) Connecting Circuit S50303
- c) Design Spec for 2X90AB and GS2X90

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	DIGITONE STATION TESTING
Feature no	F0213

DESCRIPTION

A test circuit that provides a means for testing the tone level and frequency of the digits keyed from a touchtone telephone set.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	LINE INSULATION TESTING
Feature no	F0216

DESCRIPTION

The following line insulation tests are performed from the Line Test Position (LTP):

- DC foreign E.M.F. (Tip to ground, ring to ground) in VDC
- AC foreign E.M.F. (Tip to ground, ring to ground) in VAC
- Line insulation (Tip to ground, ring to ground, tip to ring) in ohms.
- Line capacitance (Tip to ground, ring to ground, tip to ring) in microfarades.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	LOOP INTEGRITY CHECKS ON LINES
Feature no	F0217

DESCRIPTION

These are a range of functional tests that verify proper performance of transmission, supervision and signalling for a particular line circuit. These tests are done as part of internal switch diagnostics and can be requested manually. The objective of these tests is to assist in the sectionalization of troubles between the CO and loop.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	MAINTENANCE AND TESTING		
Feature	TEST LINES:	1000-BALANCE/QUIET T	
Feature no	F0218		

DESCRIPTION

The DMS system provides test terminations for line and trunk test as follows:

1111 - Milliwatt
1000 - Quiet Termination

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	MAINTENANCE AND TESTING		
Feature	TEST LINES:	1111-MILLIWATT	
Feature no	F0219		

SEE FEATURE NUMBER F0218

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	TEST LINES: 1120-NONSYNCHRONOUS
Feature no	F0220

DESCRIPTION

"Synchronous" type test lines are required for offices where ringing, tripping, and supervisory features are in the incoming trunk relay equipment. Marginal tests of the supervisory and tripping functions are provided.

A "non-synchronous" test line is required for all dial-type Class 5 offices including those having the synchronous-type test line. This line provides an operational test which is not as complete as the synchronous test but can be made more rapidly. The non-synchronous type is the only one required for those offices where marginal-type tests cannot be applied directly to the incoming trunk circuit as is frequently the case with step systems. However, test terminations provided for application of marginal-type tests to circuits, such as connectors in step-by-step offices, generally meet the minimum requirements for non-synchronous-type incoming trunk test lines and are frequently used for this purpose. In some instances, connector test terminations can be used to apply marginal tests to such circuits as toll transmission selectors.

The "loop around" test line in a class 5 office enables one person in a toll office to make 2-way transmission tests. Test calls directed to this test line are manually originated. It is used to measure the near-to-far loss of 4-wire or equivalent trunks. This test line has two terminations, each reached by means of separate customer-type telephone numbers. After having measured the far-to-near end loss of all trunks in the group (using 102 test line), one trunk is selected as a reference trunk. Using the reference trunk, one termination of this test line is dialed. Then taking each of the remaining trunks in turn, the other termination of this test line is dialed and a test signal is sent out over the trunk under test and received on the reference trunk. By knowing the far-to-near end loss of the reference trunk and the overall measurement of the two trunks, the near-to-far end loss is calculated by subtraction.

Package	NTX901AA17 LOCAL FEATURES I	
Feature set	MAINTENANCE AND TESTING	
Feature	TEST LINES:	1181-SYNCHRONOUS (OR
Feature no	F0221	

SEE FEATURE NUMBER F0220

Package	NTX901AA17 LOCAL FEATURES I	
Feature set	MAINTENANCE AND TESTING	
Feature	TEST LINES:	OPEN CIRCUIT TERMINA
Feature no	F0223	

DESCRIPTION

An open circuit termination is provided to test the stability of trunks having negative impedance type repeaters.

The features of this termination are as follows:

- 1) Trips machine ringing
- 2) Returns an off-hook signal to the calling end as long as the connection is held at the calling end
- 3) Provides an open circuit across tip and ring

REFERENCES

AT&T Notes on Distance Dialing
NTP 297-1001-516 in

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	PER CALL LINE TESTING
Feature no	F0224

DESCRIPTION

Detection of possible hardware fault during per call line testing will automatically initiate diagnostic tests on the suspect line. The line diagnostic will result in the performance of a loop fault verification test sequence. This enables relative fault sectionalization in or out of the DMS-100. The tests performed are:

- 1) Ringing pre-tripping
- 2) Permanent Signal (PS) detection
- 3) Permanent Signal Partial Dial (PSPD) detection
- 4) Mutilated digits and other dialing irregularities for both Digitone and dial pulse signalling are trapped by DMS-100.
- 5) Coin service monitoring for stuck coin and fraud
- 6) Two party ANI false ground detection

Per call tests can be cancelled for selected lines as part of the DMO process.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	PERMANENT SIGNAL/PARTIAL DIAL LOCKOUT AND AUTOMATI
Feature no	F0225

DESCRIPTION

Upon recognition of a subscriber origination request, the system will respond with dial tone. If the first digit is not received between 15 to 30 secs. the line is tested as having a permanent signal (PS) condition. This can result from a subscriber going off-hook and not dialing or by simulation of the off-hook condition caused by a line fault. A partial dial (PD) condition arises if the time out interval is exceeding during dialing of subsequent digits. When a PS/PD condition is detected, the line will be placed on the PS/PD lock-out list, network connections will be dropped and the line will be printed at the TTY. The size of the list is specified at office load time. A minor alarm and a TTY message will indicate when the number of lines in the list exceeds a certain level. If the list overflows, the first line entered is dropped and dial tone is returned to it. A line in the PS lockout list is scanned at one second intervals. Any time an on-hook condition is detected, the line is automatically cleared from the list and returned to normal.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	PLUG-UP FACILITY INTERCEPT
Feature no	F0226

DESCRIPTION

This feature provides the facilities for maintenance personnel to arrange that calls made to lines in trouble are re-routed to an intercept trunk. The subscriber on the plug-up line may also originate calls when the trouble is cleared (i.e., before the line is removed from the plug-up facility).

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	TEST LINES: SHORT CIRCUIT TERMIN
Feature no	F0227

DESCRIPTION

A short circuit termination is provided to test the stability of trunks having negative impedance type repeaters.

The features of this termination are as follows:

- 1) Trips machine ringing
- 2) Returns an off-hook signal to the calling end as long as the connection is held at the calling end
- 3) Provides an AC short circuit across tip and ring

REFERENCES

AT&T Notes on Distance Dialing
NTP 297-1001-516

Package	NTX901AA17 LOCAL FEATURES I
Feature set	MAINTENANCE AND TESTING
Feature	STATION RINGER TEST
Feature no	F0228

DESCRIPTION

This feature performs dial test, off-hook ground test and on-hook ground test. It is initiated from the subscriber phone and requires only one person.

a) Access to the test

Tester dials a 2 digit access code (typically 57) followed by the last 5 digits of the subscriber directory number. The dial test will be entered if these 5 digits belong to the circuit the call was originated from.

The DN of any party of a 2, 4 or multiparty line can be used.

b) Dial test

DMS: Gives dial tone

TESTER: Dials valid DP/DGT sequence depending on type of phone.

DMS: Gives two zips of tone for pass (one for fail). Reapply dial tone.

TESTER: Dials another sequence to stay in dial test mode

or Hangs up to abandon

or Flashes to enter OFF HOOK GROUND TEST

Valid Sequences

DGT (1) 1234567890 DP: (1) 0

(2) 2³

(3) 3#

c) Off-hook ground test

DMS: If coin line, DMS applies coin return signal

DMS: Based on tip to ground (TG) resistance when off hook, DMS gives the following tone:

for $TG < 3.7K$, Steady Low Tone (Good ring/single party)

for $1K < TG < 3.7K$, 120 IPM Low Tone (Good tip party)

for $TG < 1K$, 60 IPM Low Tone (Bad Line)

TESTER: Must hang up to move to ON HOOK GROUND TEST

Note:

In both the on-hook and off-hook ground test and ANI tst is used to tell if the TG resistance is less than or gerater than 3.7K. The LTU is used only on tip party and bad lines.

d) On-hook ground test

DMS: Based on TG resistance when on-hook, DMS gives the following tone:

for $TG > 3.7K$, Ring Line (PASS)

for $TG < 3.7K$, Don't Ring Line (FAIL)

TESTER: Hears ringing (or waits for few seconds) and takes phone off the hook.

DMS: Gives second indicaton of TG resistance

for $TG > 3.7K$, Steady low tone (PASS)

for $TG < 3.7K$, 60 IPM low tone (FAIL)

TESTER: Hangs up to abandon

or Flashes to move to off-hook ground test

Package	NTX901AA17 LOCAL FEATURES I
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	DIRECTORY ASSISTANCE CHARGING(411 RECORDING ON MAG
Feature no	F0231

DESCRIPTION

411 calls from the DMS office may be routed via the AMA system to an operator (CAMA) who then makes the decision as to whether or not the call is billable. If billable, the operator keys in the information for recording on magnetic tape.

(LAMA or CAMA) such that if answer supervision is returned the calls are recorded on AMA facilities for billing. Answer supervision may be returned on all calls or from the Directory Assistance Position upon a decision being made by the operator that the call is chargeable.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	ONI/ANI INDIVIDUAL
Feature no	F0232

DESCRIPTION

This feature permits the calling number of an individual line to be identified automatically (ANI) for billing purposes. If special billing features are required, Operator Number Identification (ONI) is used.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	NUMBER IDENTIFICATION/CHARGING
Feature	OPERATOR VERIFICATION
Feature no	F0234

DESCRIPTION

An operator from Toll Switchboard equivalent position will be able to dial up a particular telephone number and verify the status (busy or on-hook) of that line. The verification call is received over a dedicated verification trunk group.

The operator may monitor the line or be connected in a talk and listen mode.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	ONI/ANI	2-PARTY	
Feature no	F0236		

DESCRIPTION

This feature permits the calling number of either party of a 2-party line to be identified automatically (ANI) or manually (ONI) for billing purposes.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	SIGNALING AND SUPERVISION		
Feature	LINES	DIAL PULSE (10 PPS)	
Feature no	F0239		

DESCRIPTION

DIAL PULSE (DP) -----

A MEANS OF TRANSMITTING DIALLED INFORMATION FROM SUBSCRIBER'S ROTARY DIAL (STATION SET) TO THE CENTRAL OFFICE. EACH DIGIT DIALLED WILL RESULT IN ON-HOOK (OPEN LINE) PULSES, CORRESPONDING TO THE DIGIT DIALLED, BEING SENT TO THE CO. THESE PULSES ARE NORMALLY AT 10 PPS NOMINAL (7.5 PPS TO 12 PPS) WITH 58.0[±] TO 67.5[±] BREAK INTERVALS. THE INTERDIGITAL TIME IS UNDER CONTROL OF THE SUBSCRIBER.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	SIGNALING AND SUPERVISION		
Feature	LINES	DIGITONE	
Feature no	F0240		

DESCRIPTION

 DIGITONE³ (DT) -----

³ REGISTERED TRADEMARK OF NORTHERN TELECOM.

THIS IS A MEANS OF SIGNALLING BY AUDIBLE TONES GENERATED BY A DIGITONE TELEPHONE SET USING THE VOICE TRANSMISSION PATH.

THE CODE FOR THIS FEATURE PROVIDES FOR UP TO 16 DIFFERENT SIGNALS, EACH OF WHICH IS COMPOSED OF TWO VOICEBAND FREQUENCIES, ONE SELECTED FROM EACH OF TWO GROUPS OF 4 FREQUENCIES. THE LOWER GROUP FREQUENCIES ARE 697, 770, 852 AND 941 HZ, AND THE HIGHER GROUP FREQUENCIES ARE 1209, 1336, 1477 AND 1633 HZ. ALL FREQUENCIES HAVE A TOLERANCE OF¹ 1.5% .

THE DMS 100 DIGITONE RECEIVER SENSITIVITY IS IN THE RANGE OF 0 TO -22 DBM PER FREQUENCY WITH A DIFFERENCE IN LEVELS BETWEEN TWO FREQUENCIES OF A PAIR NOT EXCEEDING 5 DB.

TWELVE SIGNALS (10 FOR DIGITS, 2 FOR SPECIAL FEATURES) ARE PRESENTLY IN USE IN DMS 100 AND PROVISION IS MADE FOR UP TO 10 DIGITS PER SECOND, WITH AN INTERDIGITAL INTERVAL NOT LESS THAN 40 MSEC, TO BE RECEIVED.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	SIGNALING AND SUPERVISION		
Feature	LINES	FLASHING	
Feature no	F0241		

DESCRIPTION

FLASHING -----

A SWITCH HOOK FLASH CONSISTS OF A CHANGE FROM OFF-HOOK TO ON-HOOK AND BACK TO OFF-HOOK ON A LINE THAT HAS BEEN DETERMINED AS BUSY AND IN A NON-DIALLING STATE. DMS 100 RECOGNIZES ON-HOOK INTERVALS OF 300-1200 MS AS FLASH SIGNALS.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	SIGNALING AND SUPERVISION		
Feature	LINES	GROUND START	
Feature no	F0242		

DESCRIPTION

Ground Start

A line that generates a ground on the ring lead as a request for service (e.g., dial PBX trunk termination and some coin box operations). Ground start coin boxes are limited to 1500 ohm range and 25,000 ohm leakage (minimum) resistance must be maintained.

Loop Start

A line that generates a loop closure as a request for service. This is interpreted as an off-hook condition at the co. Maximum loop lengths of 1900 ohms (io 1900 ohms (including 500 type subscriber set) can be accommodated, beyond which loop extenders must be used. This range allows for 21 ma set current and nominal -48V office battery.

Loop leakage of 15,000 ohms minimum must be maintained for regular subscriber loops.

Flashing

A switch hook flash consists of a change from off-hook to on-hook and back to off-hook on a line that has been determined as busy in a non-dialing state. DMS-100 recognizes on-hook intervals of 300-1200 ms as flash signals.

Dial Pulse (DP)

A means of transmitting dialed information from subscriber's rotary dial (station set) to the central office. Each digit dialed will result in on-hook (open line) pulses, corresponding to the digit dialed, being sent to the CO. These pulses are normally at 10 PPS nominal (7.5 PPS to 12 PPS)

with 58.0⁴ to 67.5⁴ break intervals. The interdigital time is under control of the subscriber.

Digitone³ (DT)

³ Registered Trademark of Northern Telecom.

This is a means of signalling by audible tones generated by a Digitone telephone set using the voice transmission path.

The code for this feature provides for up to 16 different signals, each of which is composed of two voiceband frequencies, one selected from each of two groups of 4 frequencies. The lower group frequencies are 697, 770, 852 and 941 Hz, and the higher group frequencies are 1209, 1336, 1477 and 1633 Hz. All frequencies have a tolerance of +/- 1.5⁴.

The DMS-100 Digitone receiver sensitivity is in the range of 0 to -22 dBm per frequency with a difference in levels between two frequencies of a pair not exceeding 5 dB.

Twelve signals (10 for digits, 2 for special features) are presently in use in DMS-100 and provision is made for up to 10 digits per second, with an interdigital interval not less than 40 msec, to be received.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	INDIVIDUAL FLAT RATE
Feature no	F0243

DESCRIPTION

Individual lines are directly associated with one main station, perhaps with extensions. With "Flat Rate" service, the subscriber is allowed unlimited local calling within a defined service area for a flat monthly charge. Individual line ringers are bridged across the tip and ring conductors. Each individual line is assigned a unique 7 digit directory number.

For this type of line, the Telco enters IFR in the Line Attribute table.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	INDIVIDUAL MESSAGE RATE
Feature no	F0244

DESCRIPTION

Individual lines are directly associated with one main station perhaps with extensions. Service to these lines is extended on the following basis:

With "Message Rate" service, the subscriber is allowed a predetermined number of originated messages within a defined service area for a flat-monthly rate. Messages in excess of the allowable free messages are charged on a per message basis.

The individual line ringers are bridged across the tip and ring conductors.

Each individual line is assigned a unique 7 digit directory number.

For this type of line, the Telco enters IMR in the Line Attribute table. A software register is incremented each time a call is completed. The contents of the register can be queried or reset on-line.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	SIGNALING AND SUPERVISION
Feature	LINES LOOP START
Feature no	F0245

DESCRIPTION

LOOP START -----

A LINE THAT GENERATES A LOOP CLOSURE AS A REQUEST FOR SERVICE. THIS IS INTERPRETED AS AN OFF-HOOK CONDITION AT THE CO. MAXIMUM LOOP LENGTHS OF 1900 OHMS (INCLUDING 500 TYPE SUBSCRIBER SET) CAN BE ACCOMMODATED, BEYOND WHICH LOOP EXTENDERS MUST BE USED. THIS RANGE ALLOWS FOR 21 MA SET CURRENT AND NOMINAL -48 V OFFICE BATTERY.

LOOP LEAKAGE OF 15,000 OHMS MINIMUM MUST BE MAINTAINED FOR REGULAR SUBSCRIBER LOOPS.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	MANUAL LINE(MAN ORIG/DIAL TERM)
Feature no	F0246

DESCRIPTION

Calls from manual lines are automatically routed to an operator when service is requested. These lines have no dial originating capability.

Calls to manual lines terminate in the same way a they would to individual lines.

For this type of line, the Telco enters MAN as an option in the Line Assignment table.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	OFF PREMISES EXTENSIONS
Feature no	F0247

DESCRIPTION

Off-premises extension (OPX) service is provided by an extension to the main station location.

REFERENCE

Telephone Station remote from the main station location.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	TYPES OF LINES		
Feature	PBX FLAT RATE	GROUND START	
Feature no	F0249		

DESCRIPTION

A PBX LINE IS A LINE APPEARANCE AT THE CENTRAL OFFICE THAT PERMITS CONNECTION TO A CUSTOMER PREMISE SWITCHING SYSTEM. THE CONNECTING FACILITY MAY BE 2-WAY, OUTGOING, OR INCOMING. WITH FLAT RATE SERVICE, THE SUBSCRIBER IS ALLOWED UNLIMITED LOCAL CALLING WITHIN A DEFINED SERVICE AREA FOR A FLAT MONTHLY CHARGE. DMS PROVIDES THE CAPABILITY OF GROUND OR LOOP START PBX LINES.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	TYPES OF LINES		
Feature	PBX FLAT RATE	LOOP START	
Feature no	F0250		

SEE FEATURE NUMBER F0249

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	10-PARTY FLAT RATE
Feature no	F0252

DESCRIPTION

This arrangement allows for ten main stations and extensions to be served by one line, each assigned a unique 7 digit directory number.

Fire stations have ringers connected to tip side of the line, the other five to ring side of the line.

Billing of toll calls from 10 party lines is arranged on an ONI basis.

For this type of line, the Telco enters 10FR in the Line Attribute table.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	2-PARTY FLAT RATE
Feature no	F0253

DESCRIPTION

Two-party lines allow for two main stations, each with extensions, to be served by one line, with each party assigned a unique 7 digit directory number.

Ringling is applied between tip and ground for one party, and ring and ground for the other party.

Special features (e.g., customer calling services) and message rate billing are not offered for this line type. Billing of toll calls from two-party lines is arranged on an ONI or ANI basis.

For this type of line, the Telco enters 2FR in the Line Attribute table.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	4-PARTY SELECTIVE FLAT RATE
Feature no	F0254

DESCRIPTION

This arrangement allows for four main stations and extensions to be served by one line, each of which is assigned a unique 7 digit directory number. Two stations have ringers connected to the tip side of the line and other two have ringers connected to the ring side of the line.

Billing of toll calls from 4 PARTY lines is arranged on an ONI basis. For 4 party ANI, refer to NTX002AB.

Ringling applied to 4-PARTY lines is 20 Hz superimposed on +40V DC and -40V DC with the regular 2 second on/4 second off ringling code.

For this type of line, the Telco enters 4FR in the Line Attribute table.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	TYPES OF LINES
Feature	8-PARTY SEMISELECT FLAT RATE
Feature no	F0255

DESCRIPTION

This arrangement allows for 8 main stations and extensions to be served by one line, each assigned a unique 7 digit directory number.

Four stations have ringer connected to tip side of the line, the other four to ring side of the line.

Billing of toll calls from 8 party lines is arranged on an ONI.

Ringling applied to 8 PARTY lines is the same as for 4-PARTY except addition of a second ringing code.

For this type of line, the Telco enters 8FR in the Line Attribute table.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	RINGING
Feature	AC/DC
Feature no	F0256

DESCRIPTION

AC/DC ringing is the regular 20 Hz interrupted (2 sec on - 4 sec off cycle) ringing current of 86 volts (AC), superimposed on -48 volts (DC) used to ring individual lines. The DC component provides for ring trip functions, the AC component for ringer ring function.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	RINGING
Feature	CODE RING (5 CODES)
Feature no	F0257

DESCRIPTION

CODED RINGING IS USED TO RING MULTIPARTY LINES. 5 RINGING CODES ARE PROVIDED AND UP TO 10 PARTIES (5 ON TIP AND 5 ON RING SIDE OF LINE) CAN BE SERVED.

THE APPLICATION OF CODED RINGING TO A SPECIFIC CALLED PARTY RESULTS IN ALL PARTIES ON THE SAME SIDE OF THE LINE BEING RUNG (I.E. CODED RINGING IS NOT SELECTIVE). PARTIES ON THE OTHER SIDE OF THE LINE REMAIN SILENT.

REFERENCE

NTP 297-1001-109

Package NTX901AA17 LOCAL FEATURES I
Feature set RINGING
Feature FREQUENCY RINGING - HARMONIC
Feature no F0258

SEE FEATURE NUMBER F0019

Package	NTX901AA17 LOCAL FEATURES I
Feature set	RINGING
Feature	FREQUENCY RINGING - SYNCHROMONIC - 20HZ BARE
Feature no	F0259

DESCRIPTION

Frequency ringing is used by telcos for single, 2 party and multiparty service. For multiparty operation, the maximum number of parties allowed is 8. In the frequency ringing mode of operation, each ringer is tuned to a specific frequency such that the application of ringing to the called party results only in the specific party called being rung.

The particular frequencies used in the various types of frequency ringing are:

- 1) 16 2-3, 25, 33 1/3, 50, 66 2/3 Hz - Harmonic ringing
- 2a) 20, 30, 42, 54, 66 Hz - Synchronomic ringing (20 Hz base)
- 2b) 16 2/3, 30, 42, 54 Hz - Synchronomic ringing (16 Hz base)
- 3) 20, 30, 40, 50, 60 Hz - Decimonic ringing

The type of frequency ringing is telco specifiable.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	RINGING		
Feature	REVERTIVE RINGING	MULTI-PARTY	
Feature no	F0260		

DESCRIPTION

Revertive ringing in a multiparty system is ringing applied to the calling side in the event of a revertive call. Two cases have to be considered:

a) Calling and called parties on the same side of the line:

In this case, both calling and called parties hear the coded ringing of the called party.

b) Calling and called parties on opposite sides of the line:

In this case, the called party (in fully selective system) or the called side (in semi-selective system) hears the coded ringing and revertive ringing (i.e. a 0.5 sec on, 5.5 sec off ringing cycle) is applied to the calling side.

In either case the calling party must not go off-hook until called party answer (indicate by ring tip) otherwise, the call has to be placed again.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	RINGING		
Feature	REVERTIVE RINGING	2-PARTY	
Feature no	F0261		

DESCRIPTION

Revertive ringing is ringing applied to the calling line/side in the event of revertive calling of a two party of multiparty line.

This revertive ringing is used to indicate to the calling party when he may lift his receiver and start conversation (i.e. when he hears ring tip). The calling party must not go off-hook before called party answer, otherwise the call has to be placed again.

In the case of a two party line, normal ringing (2 second on, 4 second off) is used to ring both the calling party and the called party (either tip or ring side).

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	RINGING		
Feature	SUPERIMPOSED	4-PARTY FULLY SELECT	
Feature no	F0263		

DESCRIPTION

Superimposed ringing system basically uses positive and negative d.c. bias voltages, together with the 20 Hz ringing current and devices such as gas tubes are provided within the subscriber's telephone set in order to polarize the ringing.

With this arrangement, two parties are connected to the ring side, and the other two to the tip side. When superimposed ringing is applied, only one party is rung (the telephone set with the right polarity).

This feature implies divided ringing.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	LOCAL END OFFICE ROUTING & SCREENING
Feature no	F0265

DESCRIPTION

Digit translation, route selection and class of service screening functions necessary for completion of calls within the local network are provided.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	MULTI-RATE CENTRE
Feature no	F0266

DESCRIPTION

If a switching centre is located near the boundary of two rate-zones, it is likely that a portion of the subscribers connected to this office are in one rate-zone and the remaining portion in the other zone. Call screening is provided to differentiate subscribers located in the different rate zones.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	OFFICE CODE SHARING- THOUSANDS DIGITS TRANSLATION
Feature no	F0267

DESCRIPTION

By means of a 4-digit translation, it is possible to provide different routes for thousands groups of directory numbers within the same office code.

This feature, for example, makes it possible to share an office code with other central offices through local tandeming capability.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	SWITCHING AND TRANSLATION
Feature	THEORETICAL OFFICE
Feature no	F0269

DESCRIPTION

Calls to subscribers in different rate centres, but served by the same office, and be screened for the purpose of proper charging. These subscribers are identified on a theoretical NNX code on an individual line basis.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	CUSTOMER SERVICE
Feature	TOLL DIVERSION
Feature no	F0359

DESCRIPTION

This feature (TDV) permits the PBX station users to access the local central office and dial local service area calls, but prevents completion of toll calls or calls to the toll operator without the assistance of the PBX attendant.

Attempted toll calls will cause a pulse of reverse battery signal to be sent from the Central Office (CO) over the PBX-CO trunks. This will cause the required treatment in the PBX (e.g. route to the attendant).

Package	NTX901AA17 LOCAL FEATURES I
Feature set	ADMINISTRATION
Feature	FRAUDULENT CALL PREVENTION
Feature no	F0625

DESCRIPTION

DMS prevents the fraudulent use of unauthorized access to test lines and loop around test lines.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	ONI	8-PARTY	
Feature no	F0801		

DESCRIPTION

This feature permits the calling number of any party of an 8-party line to be identified manually (ONI) for billing purposes.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	NUMBER IDENTIFICATION/CHARGING		
Feature	ONI	10-PARTY	
Feature no	F0802		

DESCRIPTION

This feature permits the calling number of any party of 10-party line to be identified manually (ONI) for billing purposes.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	RINGING		
Feature	FREQUENCY SELECTIVE	SYNCHROMONIC-16HZ	BA
Feature no	F0826		

SEE FEATURE NUMBER F0019

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	RINGING		
Feature	REVERTIVE RINGING	NO REVERTIVE RING	
Feature no	F0827		

DESCRIPTION

Standard revertive calling using 2 and multiparty coded ringing schemes involves the application of 'revertive ringing' to the calling party if the calling and called parties are on different sides of the line. The 'no revertive ringing' feature eliminates the need for the above since each telephone set is equipped with a monitor button which allows the calling party to monitor ringing of the called party by means of an ac bridge.

If the calling and called party are both on the same side of the line, then ringing will be heard by both parties.

This feature will be offered on a per office basis.

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	RINGING		
Feature	SUPERIMPOSED	8-PARTY SEMI SELECTI	
Feature no	F0828		

DESCRIPTION

Superimposed and divided ringing is used to provide 8 party semi-selective ringing.

The system basically uses positive and negative dc bias voltages, together with the 20 Hz ringing signal, and devices such as gas tubes are provided within the subscriber's telephone set in order to polarize the ringing.

With this arrangement, four parties are connected to the ring side and the other four to the tip side. When the superimposed ringing is applied, two parties are rung simultaneously, differentiation being made by single ring ("code 1") and two ring ("Code 2") codes.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	FACILITIES
Feature	LCM BASIC CALL PROCESSING AND MAINTENANCE
Feature no	F1348

FEATURE SYNOPSIS

This feature provides facility support for the LCM, diagnostic and maintenance capabilities. The software is downloaded from the CC via the LGC.

FEATURE DESCRIPTION

This feature provides downloadable software for the LCM control processor in support of call processing, messaging to the LGC, maintenance diagnostics and line control for ringing, ANI and coin functions.

Package NTX901AA17 LOCAL FEATURES I
Feature set ADMINISTRATION
Feature FLEXIBLE LEN NUMBERING
Feature no F1353

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	COIN LINE SERVICE		
Feature	COIN CONTROL	LINE NUMBER METHOD	
Feature no	F2152		

DESCRIPTION

When a customer deposits a coin at a paystation and establishes a connection to the operator through an operator office trunk, the trunk signals the operator that the call has originated from a paystation by sending her a momentary zip tone. The initial coin deposit is automatically returned when the operator answers. In order to enable the operator to collect or return coins deposited later, another operator office trunk in a different trunk group is selected by the operator who dials 12 + XXXX of coin line to collect coins or 17 + XXXX to return coins.

This feature puts the following restrictions on DMS-100 trunking and assignment on C.O. station codes:

1. Only one way trunk groups (operator to DMS-100) can be used.
2. C.O. station codes 12XX and 17XX cannot be assigned.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	CUSTOMER SERVICE
Feature	LINE CUT OFF RELAY OPERATION ON DISCONNECT
Feature no	F2197

DESCRIPTION

A new command LCO (Line Cut Off) located in the LTP MAP level allows a craftsperson to operate or release the cut off relay for the posted line card(s). The format of the command is:

LCO (Released R, Operated O) ALL

The ALL option may be used to operate or release all the cutoff relays when the posted set of line cards are:

- (i) directory numbers
- (ii) a drawer
- (iii) a huntgroup

Operating the cutoff relay is allowed on lines with a state of INB, MB, CUT, LO, IDL or PLO resulting in a line state of CUT. Releasing a cutoff relay results in the line state going from CUT to IDL except for the case of hardware assigned, software unequipped (HASU) lines where the line state goes from CUT to IDL.

Operating the cutoff relay of a linecard sets the cut bit in the protected data store for that linecard to true. Therefore, the state of the cutoff relay is remembered across system restarts.

This feature can be used to isolate the subscriber line completely from the exchange battery feed.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	ADMINISTRATION
Feature	REVERTIVE CALL PEG COUNT REGISTER
Feature no	F2269

DESCRIPTION

An additional field will be provided in the line module traffic (LMO) table to peg the number of revertive call completions on per line module basic. The point of measurement (POM) will be at application of ringing. in

Package	NTX901AA17 LOCAL FEATURES I		
Feature set	MAINTENANCE AND TESTING		
Feature	TEST LINES:	LOOP AROUND	
Feature no	F2281		

DESCRIPTION

The loop around test line (located in a class 5 office) allows one person in the toll office to make 2-way transmission tests. Test calls directed to this test line are manually originated. It is used to measure the near-to-far loss of 4-wire or equivalent trunks. This test line has two terminations, each reached by means of separate customer-type telephone numbers. After having measured the far-to-near end loss of all trunks in the group (using 102 test line), one trunk is selected as a reference trunk. Using the reference trunks, one termination of this test line is dialed. Then taking each of the remaining trunks in turn, the other termination of this test line is dialed and test power is sent out over the trunk under test and received on the reference trunk. By knowing the far-to-near end loss of the reference trunk and the overall measurement of the two trunks, the near-to-far end loss is calculated by subtraction.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	ADMINISTRATION
Feature	CLI - TRUNK TERMINATION
Feature no	F2320

DESCRIPTION

This feature is activated by an input command registering the called number external to the switching unit on a CLI list. All calls to the called number are identified whether the called party answers or not. An output record is generated as follows:

a) Trunk to Trunk (tandem)

Incoming trunk number, DN of called party, date and time

b) Line to Trunk (originating)

DN of calling and called parties, date and time. If the calling directory number cannot be identified, the number will be replaced by originating equipment number and tip and ring side identification, if available.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	COIN LINE SERVICE
Feature	CHARGE - A - CALL (COIN FREE DIALING)
Feature no	F2427

FUNCTIONAL DESCRIPTION

Coin-free-dialing permits the customer to make Inwatts, Directory Assistance, and 0- calls from a public phone with no coin handling capabilities.

The only other permissible calls are 0+ or 01+ calls which get routed to the TSPS operator and are identified by the ANI digit 7.

All other calls will be routed to the new DCFC (Disallowed Coin Free Call) treatment.

The CFD line can optionally be denied from receiving incoming calls by assigning the DNT option.

Package	NTX901AA17 LOCAL FEATURES I
Feature set	COIN LINE SERVICE
Feature	EXPANDED INBAND SIGNALLING
Feature no	F2433

FUNCTIONAL DESCRIPTION

The Expanded Inband Signalling is applicable in two different environments.

1) NONCOIN

The DMS upon detection of a 150 msec to 450 msec wink signal from the TOPS/TSPS office, will monitor for the Ringback MF-tone. On detection of the Ringback tone, the DMS will ring back the calling line. The Ringback tone is defined in a Figure in this section.

There is a delay of 810 (+-40) msec after the wink before the MF tones are to be received. The total interval from the end of the wink to the end of the MF tones is approximately 1410 (+-70) msec.

The DMS repeats customer on-hook and off-hook flash signals and disconnect supervisions to the TOPS/TSPS. If the DMS detects that the calling line has gone on-hook, and has been on-hook for approximately 1.2 secs, the DMS maintains on-hook to the TOPS/TSPS until disconnect supervision or a wink signal is returned from the TOPS/TSPS regardless of the supervisory status of the line. The DMS will provide an Operator (TOPS/TSPS) hold.

If the calling line remains off-hook after the DMS receives disconnect supervision from the TOPS, the TOPS will maintain the on-hook disconnect supervision for approximately 10 secs before bringing down the call.

2) COIN

The signalling sequence is the same as defined above for Ringback. Except that the DMS100 will also monitor for Coin-collect, Coin-return, Operator-attached, Operator-released, and 'Combined Coin-collect and Operator-released' MF tones.

A Coin-return is always performed on the coin station at the end of the call.

This feature requires the DMS to perform the Red-Box Fraud prevention on specially equipped sets served from dial-tone first lines. This is done by blocking the transmission of coin deposit tones fraudtently simulated by the user. The operator released signal enables the DTMF pad, thus allowing end-to-end DTMF signalling.

MF INBAND TONES	MF DIG EQV.
Coin Collect (700 + 1100 Hz)	Digit 2
Coin Return (1100 + 1700 Hz)	Digit KP
Ringback (700 + 1700 Hz)	Digit ST3
Oper Released (900 + 1500 Hz)	Digit 8
Oper Attached (1300 + 1500 Hz)	Digit 0
Combined Coin Collect & Oper Released (1500 + 1700 Hz)	Digit ST

Figure: EXPANDED INBAND SIGNALS

The normal-polarity on dial-tone-first coin lines, with Expanded Inband signalling, can be controlled by the telco through an office parameter in table OFCVAR. The name of the parameter is CDF_OPERATOR_RELEASED_ON_OA.