Critical Release Notice

Publication number: 297-8021-350
Publication release: Standard 19.05

The content of this customer NTP supports the SN09 (DMS) software release.

Bookmarks used in this NTP highlight the changes between the NA015 baseline and the current release. The bookmarks provided are color-coded to identify release-specific content changes. NTP volumes that do not contain bookmarks indicate that the NA015 baseline remains unchanged and is valid for the current release.

Bookmark Color Legend

Black: Applies to content for the NA015 baseline that is valid through the current release.

Red: Applies to new or modified content for NA017 that is valid through the current release.

Blue: Applies to new or modified content for NA018 (SN05 DMS) that is valid through the current release.

Green: Applies to new or modified content for SN06 (DMS) that is valid through the current release.

Purple: Applies to new or modified content for SN07 (DMS) that is valid through the current release.

Pink: Applies to new or modified content for SN08 (DMS) that is valid through the current release.

Orange: Applies to new or modified content for SN09 (DMS) that is valid through the current release.

Attention!
Adobe® Acrobat® Reader™ 5.0 or higher is required to view bookmarks in color.

Publication History

Note: *Refer to the NA015 baseline document for Publication History prior to the NA017 software release.*

January 2006

Standard release 19.05 for software release SN09 (DMS). Updates made for this release are shown below:

Volume 1-3

No changes

Volume 4

Section Channelized access on LPP/LIS, Datafilling table TRKMEM (Sheet 6 of 6), removed (TBD) from remote unit as required by CR Q01256730.

Volume 5-16

No changes

Volume 17

Section Universal Access to CLASS Features, RESOFC field, note added as required by CR Q01218960.

Section Call Forwarding Remote Activation, Limitations and Restrictions, bullet added as required by CR Q01168869.

Volume 18-25

No changes

September 2005

Standard release 19.04 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 1

Section PRI trunk groups, Datafilling table TRKSGRP, L1Flags description corrected for Q01112597.

Volume 10

Section DMS-100 and Meridian 1 Options 11-81 datafill correlation, Table 15-2, L1Flags description corrected for Q01112597.

Volume 17

Call Forwarding Remote Activation, Speed Calling description corrected for Q01095576.

August 2005

Standard release 19.03 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 9

Documentation correction in Call Forward/Interface Busy. CR Q01038988 was incorrectly referred to as CR Q01038999 in the March 2005 documentation release. This has been corrected in the History section for Call Forward/Interface Busy, and in this Critical Release Notice.

Volume 14

Changes made to Residential Call Hold. "Table flow for Residential Call Hold (RCHD)" amended. (Q01038649)

June 2005

Standard release 19.02 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 14

Changes made to Group Intercom All Call (Q00100917)

Volume 16

Changes made to Automatic Call Distribution (Q01091391)

March 2005

Preliminary release 19.01 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 1-8

No changes

Volume 9

Modified – Call Forward/Interface Busy by CR Q01038988

Volume 10-25

No change

December 2004

Standard release 18.02 for software release SN07 (DMS). Updates made for this release are shown below:

Volume 1-12

No changes

Volume 13
Added Virtual Office Worker (VOW) by A00002011

Volume 14-16
No changes

Volume 17
Universal Access to Call Forwarding (UCFW) changes to AMA billing by CR Q00982215

Volume 18-23
No changes

Volume 24
Added OSSAIN XA-Core Data Messaging Capacity Enhancements by A00005160

Volume 25
No changes

September 2004

Preliminary release 18.01 for software release SN07 (DMS). Updates made for this release are shown below:

Volume 1
Modified – Introduction to trunk tables (ES trunk groups) by CR Q00838215-1

Volume 2-3
No changes

Volume 4
Modified – Datafilling Trunk Signaling (ISUP Hop Counter) by CR Q00760514-10

Volume 5-10
No changes

Volume 11
Modified – Datafilling MDC Minimum (Call Pickup) by CR Q00879738

Volume 12
Modified – Datafilling MDC MSAC (Do Not Disturb) by A00002196

Volume 13-15
No changes

Volume 16
Modified – Datafilling ACD Base (Base automatic call distribution) by CR Q00812364

Volume 17
Modified – Datafilling RES Advanced Custom Calling (900 FP) by CR Q00834222
Modified – Datafilling RES Advanced Custom Calling (CSMI) by CR Q00683891
Modified – Datafilling RES Advanced Custom Calling (CWAS) by CR Q00891675-01
Modified – Datafilling RES Advanced Custom Calling (Enhanced CSMI) by CR Q00683891

Volume 18
No changes

Volume 19
Modified – Datafilling RES Service Enablers (SLE) by CR Q00760256

Volume 20
Modified – Datafilling Emergency Number Services (E911 Wireless ALI Interface) by CR Q00856825

Volume 21-24
No changes

Volume 25
Modified – Datafilling Unbundling (UNBN OPTRANS and EA) by A00002765

March 2004

Standard release 17.03 for software release SN06 (DMS). Updates made for this release are shown below:

Volume 1- 9
No changes

Volume 10
Changes due to CR Q00757372 that clarify the applicability of the AUDTRMT option. The changes are in sections:

- 7 Datafilling NI0 NI-2 PRI, PRI Call Screening
- 8 Datafilling NI0 ISDN PRI Base, Flexible Digit Analysis
- 8 Datafilling NI0 ISDN PRI Base, PRI ISDN Treatments
- 9 Datafilling NI0 ISDN PRI CNAM, PRI SUSP for CNAME

Volume 11-16
No changes

Volume 17
Modified - Call Screening, Monitoring, and Intercept (CSMI) for Q00659151
Modified - RES Simultaneous Ringing for Q00715967
Modified - Usage Sensitive Three-way Calling (U3WC) for Q00703423-03

Volume 18
Changes to Chapter 1 - Datafilling RES Display Functionality and Privacy, Anonymous Caller Rejection (ACRJ) as follows:

- change to description of interaction with Call Forwarding Don't Answer (CFDA) for CR Q00773476
- change to description of interaction with SOC RES00011 for CR Q00735537.

Volume 19
Changes due to CR Q00735537, which shows the interaction of various services with SOC RES00011. The changes are in Chapter 1 – Datafilling RES non-display services, and the affected services are:

- Distinctive Ringing/Call Waiting (DRCW)
- Selective Call Acceptance (SCA)
- Selective Call Forwarding (SCF)
- Selective Call Rejection (SCJ)

Volume 20
Changes due to CR Q00757372, which clarifies the applicability of the AUDTRMT option. The changes are in section:

- 2 Datafilling Emergency Number Services, E911 PRI PSAP Delivery

Volume 21-25
No changes

September 2003

Standard release 17.02 for software release SN06 (DMS). Updates made for this release are shown below:

Volume 1
New - Panther support for third-party RMs
Modified - E911 trunk groups

Volume 2-11
No changes

Volume 12
Modified - Query Functional Station Grouping

Volume 13-14
No changes

Volume 15
Modified - VMX Interface

Volume 16
No changes

Volume 17
Modified - Call Screening, Monitoring, and Intercept (CSMI)
Modified - Enhanced CSMI
Modified - Long Distance Alerting
Modified - Long Distance Alerting Enhancement (LDAE)
Modified - Service Order Simplification for MADN Extension Bridging

Volume 18
Modified - Call Logging (CALLOG) Modified - Universal Voice Messaging
Modified - Voice Mail Easy Access (VMEA)

Volume 19
Modified - CMS AR Screening of Private Calls (CASOP)
Modified - In-Session Activation (ISA)

Volume 20
Modified - DMS Integrated E911 PSAP Functionality
Modified - E911 Incoming Wireless Calls
Modified - E911 Incoming Wireless Calls (MF)
Modified - E911 ISUP Parameter Enhancements
Modified - E911 ISUP Trunking
Modified - E911 Tandem
Modified - E911 Translations Robustness
Modified - VFG Support for E911 (LOC and/or ISUP/ANI Call)

Volume 21-25
No changes

June 2003

Preliminary release 17.01 for software release SN06 (DMS). Updates made for this release are shown below.

Volume 1-25
New Critical Release Notice added. Otherwise, no changes

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297-8021-350

DMS-100 Family

North American DMS-100

Translations Guide Volume 9 of 25

Data, ISDN, and Internet Services Part 2 of 3

LET0015 and up Standard 14.02 May 2001

NORTEL NETWORKS™

DMS-100 Family

North American DMS-100

Translations Guide Volume 9 of 25

Data, ISDN, and Internet Services Part 2 of 3

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NTP Summary Contents

This summarized table of contents de nes the cate gory of product information that can be found in each volume of the *Translations Guide*. Each volume of the *Translations Guide* contains a detailed listing of the contents of that volume and a multi-volume contents listing if related subject matter spans multiple volumes.

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1 Data lling NI0 NI-1 P acket

The following chapter describes the NI0 NI-1 Packet, NI000010, functionality.

Changing Packet Service Defaults

Functionality code

Functional group ordering code: NI000010

Release applicability

BCS36 and up

Prerequisites

To operate, the Changing Packet Service Defaults functionality requires the following functional groups:

- NI0 ISDN Base—NI000007
- NI0 NI-1 BRI—NI000008
- MDC Minimum—MDC00001

Description

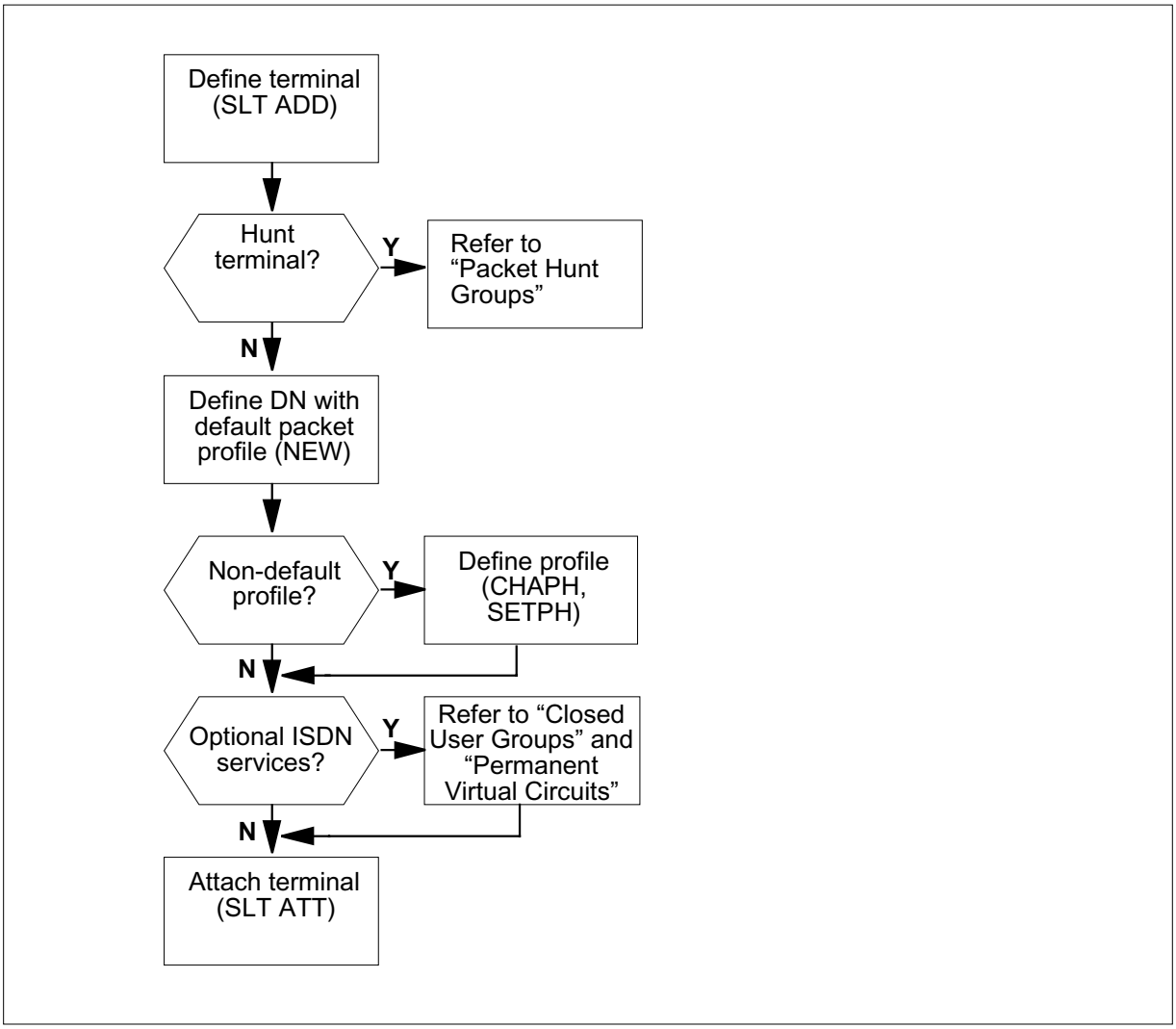
Packet service is the information that allows packet service call processing to occur on a BRI terminal. Provisioning packet service on a terminal consists of specifying the parameters of the basic service, and any options required, primarily through the Service Order (SERVORD) system.

Operation

The following o wchart illustrates the overall process of provisioning packet service. This process includes provisioning base packet service, and the optional packet services (CUGs, PVCs, and hunt groups), which are described in the later sections of this chapter.

Changing Packet Service Defaults (continued)

Provisioning packet service



Default parameters

Base packet service can be provided to a terminal over a provisioned B-channel or D-channel. Either type of service can be associated with a directory number (DN) but a particular DN cannot have access to packet service on both types of channels. A number of parameters de ne the X.25 data link layer (2) and packet layer (3) service characteristics. These parameters are categorized as LAPB, LAPD and DNA parameters.

The LAPB and LAPD categories are broader than what is implied by conventional data link layer de nition. The y contain data link layer parameters associated with a particular channel (B or D), as well as some packet layer parameters that vary with the type of channel. For example, the

Changing Packet Service Defaults (continued)

parameters that allocate the logical channel numbers to different types of virtual circuits (permanent, one-way incoming) are associated with LAPB or LAPD parameters because the allowable ranges for these layer 3 parameters vary with the channel type. The LAPB, LAPD and DNA parameters are listed in the three tables that follow.

LAPB parameters, associated DMS parameters, and affected elds are shown in the following table.

LAPB parameters (Sheet 1 of 2)

SERVORD parameter	DMS parameter	Table affected	Field affected
LNKPROC	link layer frame sequence	DNCHNL	LLFSQ
	packet layer sequence	DNCHNL	PLSQ
RESPT1	T1 timer	DNCHNL	T1
RETRYN2	retry limit N2	DNCHNL	N2
FRMWDWK	link layer window size	DNCHNL	LLWS
IDLPBT3	idle probe timer T3	DNCHNL	T3
RESPDTMR	response delay timer T2	DNCHNL	T2
WDWNEG	flow control parameter negotiation	DNCTINFO	FCPN
PKTNEG	flow control parameter negotiation	DNCTINFO	FCPN
TPTNEG	throughput class negotiation	DNCTINFO	TCN
LCNBASE*	starting LCN	DNCHNL	SLCN
NUMLCN*	number of non-restricted channels (two-way)	DNCHNL	NNRC
NUMPVC*	number of PVC channels	DNCHNL	NPVC
NUMOVC*	number of one-way outgoing logical channels	DNCHNL	NOWO

Note: Parameters marked with an asterisk (*) are service affecting.

Changing Packet Service Defaults (continued)

LAPB parameters (Sheet 2 of 2)

SERVORD parameter	DMS parameter	Table affected	Field affected
NUMIVC*	number of one-way incoming logical channels	DNCHNL	NOWI
NUIOPT	network user identification	DNCTINFO	NUI
Note: Parameters marked with an asterisk (*) are service affecting.			

LAPD parameters, associated DMS parameters, and affected elds are shown in the following table.

LAPD parameters

SERVORD parameter	DMS parameter	Table affected	Field affected
WDWNEG	flow control parameter negotiation	DNCTINFO	FCPN
PKTNEG	flow control parameter negotiation	DNCTINFO	FCPN
TPTNEG	throughput class negotiation	DNCTINFO	TCN
LCNBASE*	starting LCN	DNCHNL	SLCN
NUMLCN*	number of non-restricted channels (two-way)	DNCHNL	NNRC
NUMPVC*	number of PVC channels	DNCHNL	NPVC
NUMOVC*	number of one-way outgoing logical channels	DNCHNL	NOWO
NUMIVC*	number of one-way incoming logical channels	DNCHNL	NOWI
NUIOPT	network user identification	DNCTINFO	NUI

Changing Packet Service Defaults (continued)

DNA parameters, associated DMS parameters, and affected elds are sho wn in the following table.

DNA parameters (Sheet 1 of 2)

SERVORD parameter	DMS parameter	Table affected	Field affected
DNASPEC	DN (X.121 or E.164)	DNCHNL	DIG_KEY
		DNCTINFO	DIG_KEY
EXPLRPOA	RPOA barred	DNCTINFO	RPOAB
INACCESS	CUG subscribed (CUG out-access barred)	DNCTINFO	CUGS
	CUG subscription	DNCTINFO	CUGFSEL
INFAST	fast select acceptance (unrestricted and restricted)	DNCTINFO	FSA
INNPRC	reverse charge acceptance	DNCTINFO	RCA
INONLY	outgoing calls barred	DNCTINFO	OCB
OUT	local charge prevention	DNCTINFO	LCP
OUTACCESS	CUG subscribed (CUG in-access barred)	DNCTINFO	CUGS
	CUG subscription	DNCTINFO	CUGFSEL
OUTONLY	incoming calls barred	DNCTINFO	ICB
RECVPKT*	incoming maximum packet size	DNCHNL	IMPS
RECVTPT*	incoming default throughput class assignment	DNCHNL	IDTCA
RPOAPDNIC	interchange carrier subscription RPOA (recognized private operating agency) selection (carrier)	DNCTINFO	ICS

Note: Parameters marked with an asterisk (*) are service affecting.

Changing Packet Service Defaults (continued)

DNA parameters (Sheet 2 of 2)

SERVORD parameter	DMS parameter	Table affected	Field affected
	RPOA selection (E.164)	DNCTINFO	E164RPOA
	RPOA selection (X.121)	DNCTINFO	X121RPOA
RXWDW*	incoming packet layer window size	DNCHNL	IPLWS
SENDPKT*	outgoing maximum packet size	DNCHNL	OMPS
SENDTPT*	outgoing default throughput class assignment	DNCHNL	ODTCA
TXWDW*	outgoing packet layer window size	DNCHNL	OPLWS
Note: Parameters marked with an asterisk (*) are service affecting.			

Provisioning basic packet service can require two main steps:

1. Provisioning base service on a BRI packet terminal. This step is described in the chapter titled “Data lling Base Service."
2. Changing default parameters: When provisioning base packet service, the LAPB, LAPD, and DNA parameters are automatically assigned default values that correspond to the National ISDN-1 (NI-1) values for the parameters. If any of the defaults for service-affecting parameters are not acceptable, they can be changed for an individual terminal using the following procedure:
   a. Detach the terminal from the LEN (with the SERVORD command SLT DET).
   b. Change the appropriate defaults (with SETPH or CHAPH).
   c. Attach the terminal again (with SLT ATT).

Refer to the “Changing default packet service" o wchart. If the parameters are not service affecting, the terminal does not have to be detached. (Service-affecting parameters are indicated in the previous tables.)

Changing Packet Service Defaults (continued)

Switch-wide defaults

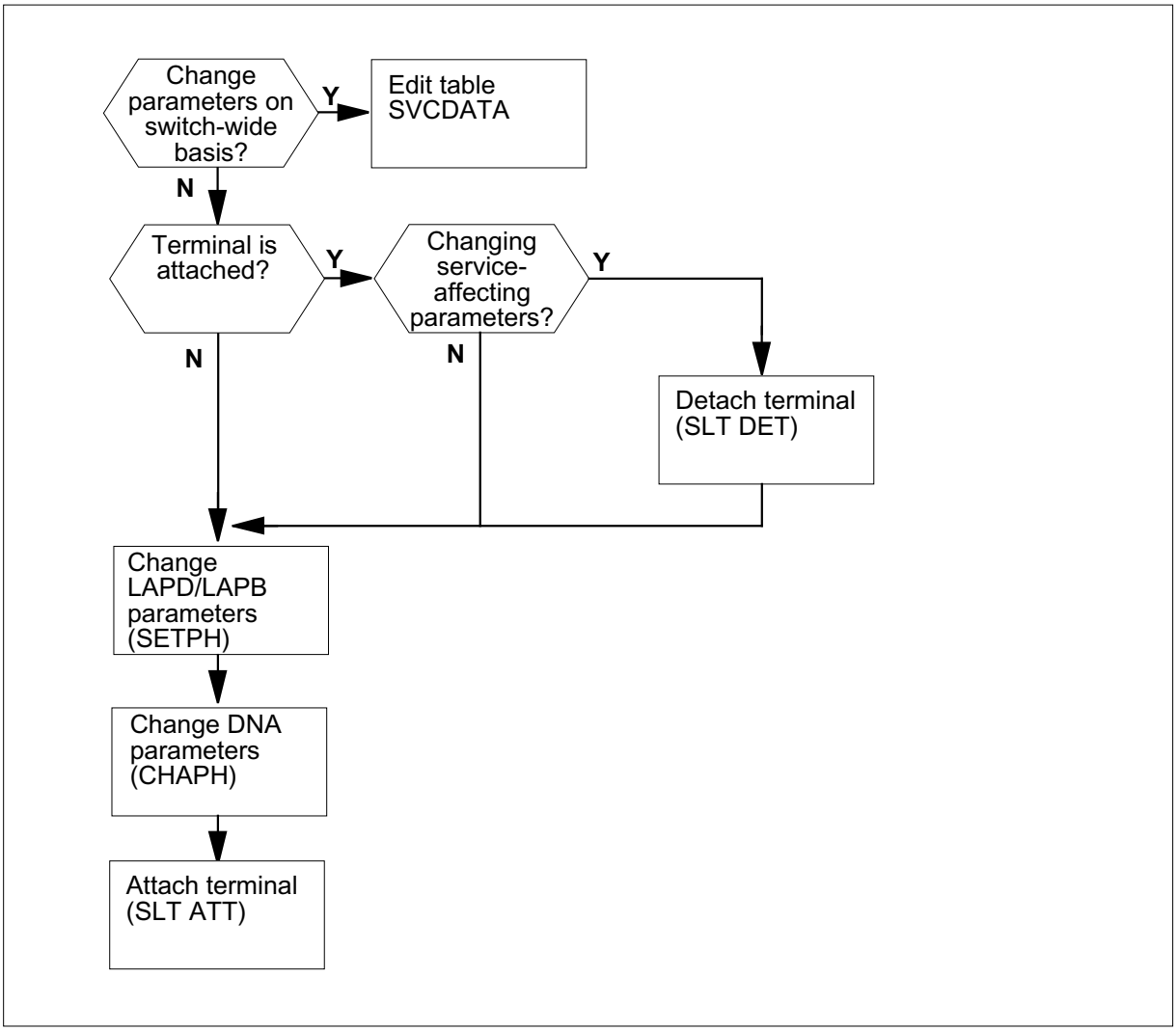
The operating company can change the default LAPB, LAPD, or DNA parameter values and set new values on a switch-wide basis. This is achieved by data lling three of the tuples in table SVCD ATA:

- the DNCTINFO tuple contains defaults for the DNA, LAPB, and LAPD parameters in table DNCTINFO
- the DNCHNLB tuple contains defaults for the DNA and LAPB protocol parameters in table DNCHNL
- the DNCHNLD third tuple contains defaults for the DNA and LAPD protocol parameters in table DNCHNL

At load-build time, table SVCDATA contains the NI-1 standard defaults in these three tuples, but they can be altered by the operating company as required. Once the tuples in table SVCDATA are altered, these values, rather than the original default values, in tables DNCTINFO and DNCHNL when the individual DNs are created. These values, in turn, can be changed for individual terminals, if necessary, following the procedure outlined in the “Changing default packet service" o wchart.

Changing Packet Service Defaults (continued)

Changing default packet service



DMS packet handler quick reference

The following table is a quick reference for changing packet service parameters. The table lists NI-1 packet service parameters alphabetically by the name of the Bellcore-de ned service, and pro vides a summary of how to assign that service or change its default values on the DMS-100. The rst

Changing Packet Service Defaults (continued)

column lists the Bellcore-de ned service and the corresponding DMS service or services, and the second column provides the assignment summary.

NI-1 packet service parameters (Sheet 1 of 13)

Bellcore-defined service	
DMS-100 service	*DMS-100 assignment*
Acknowledgement Timer T1, LAPB	
Acknowledgement timer	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter RESPT1. At the RESPT1 prompt, enter the value. Value is 10 to 200, where one unit equals 100 ms. Default is 20 (2 s). ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
B-channel Incoming Default Throughput Class (in bps)	
Incoming default throughput class assignment	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter RECVTPT. At the RECVTPT prompt, enter the value. Value is 3 to 13. Default is 13 (64000). ***Note:*** To change the value of the RECVTPT parameter, the LTID must be detached from the LEN.
B-channel Incoming Maximum Packet Size	
Incoming maximum packet size	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter RECVPKT. At the RECVPKT prompt, enter the value. Value is16, 32, 64, 128, or 256. Default is 128. ***Note:*** To change the value of the RECVPKT parameter, the LTID must be detached from the LEN.
B-channel Outgoing Default Throughput Class (in bps)	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 2 of 13)

Bellcore-defined service	
Outgoing default throughput class assignment	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter SENDTPT. At the SENDTPT prompt, enter the value. Value is 3 to 13. Default is 13 (64000). ***Note:*** To change the value of the SENDTPT parameter, the LTID must be detached from the LEN.
B-channel Outgoing Maximum Packet Size	
Outgoing maximum packet size	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter PVC. When SERVORD prompts for a DNA_PARM, enter SENDPKT. At the SENDPKT prompt, enter the value. Value is 16, 32, 64, 128, or 256. Default is 128. ***Note:*** To change the value of the SENDPKT parameter, the LTID must be detached from the LEN.
Closed User Group Subscription	
Closed user group facility selection	Ensure that the DN/CT belongs to a CUG. Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter INACCESS. At the INACCESS prompt enter the value according to the scheme listed below. When SERVORD prompts for a DNA_PARM, enter OUTACCESS. At the OUTACCESS prompt enter the value according to the scheme listed below. • OCUG = INACCESS is N and OUTACCESS is N • CUGOA = INACCESS is N and OUTACCESS is Y • CUGIA = INACCESS is Y and OUTACCESS is N • CUGOAIA = INACCESS is Y and OUTACCESS is Y Value is OCUG, CUGOA, CUGIA, CUGOAIA, or N. Default is N(o) if the DN/CT does not belong to a CUG. Default is CUGOAIA (INACCESS is Y and OUTACCESS is Y) once the DN/CT is added to a CUG.
Compatibility with DTE	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 3 of 13)

Bellcore-defined service	
Access privilege	Set up logical terminal using SERVORD command SLT ADD. When SERVORD prompts for CS enter N(o), and at the PS prompt, enter B or D. Value is B (LAPB) or D (LAPD). No default.
CUG Index Code	
CUG index number	Use the ADDPH command in SERVORD. At the ADD_OPTION prompt, enter CUG. When SERVORD prompts for a CUGINDEX, enter the value. Value is 0 to 99. No default.
D-channel Incoming Default Throughput Class (in bps)	
Incoming default throughput class assignment	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter RECVTPT. At the RECVTPT prompt, enter the value. Value is 3 to 10. Default is 10 (9600). ***Note:*** To change the value of the RECVTPT parameter, the LTID must be detached from the LEN.
D-channel Incoming Maximum Packet Size	
Incoming maximum packet size	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter RECVPKT. At the RECVPKT prompt, enter the value. Value is16, 32, 64, 128, or 256. Default is 128. ***Note:*** To change the value of the RECVPKT parameter, the LTID must be detached from the LEN.
D-channel Outgoing Default Throughput Class (in bps)	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 4 of 13)

Bellcore-defined service	
Outgoing default throughput class assignment	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter SENDTPT. At the SENDTPT prompt, enter the value. Value is 3 to 10. Default is 10 (9600). ***Note:*** To change the value of the SENDTPT parameter, the LTID must be detached from the LEN.
D-channel Outgoing Maximum Packet Size	
Outgoing maximum packet size	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter SENDPKT. At the SENDPKT prompt, enter the value. Value is 16, 32, 64, 128, or 256. Default is 128. ***Note:*** To change the value of the SENDPKT parameter, the LTID must be detached from the LEN.
Fast Select Acceptance	
Fast select acceptance	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter INFAST. At the INFAST prompt, enter the value. Value is Y or N. Default is N (not accepted).
Flow Control Parameter Negotiation	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 5 of 13)

Bellcore-defined service	
Flow control parameter negotiation	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM or LAPD_PARM, enter WDWNEG. At the WDWNEG prompt, enter the value. Value is Y or N. Default is N (not allowed). Enter Y to allow window size negotiation. Both WDWNEG and PKTNEG (see below) must be set to Y to allow FCPN. Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM or LAPD_PARM, enter PKTNEG. At the PKTNEG prompt, enter the value. Value is Y or N. Default is N (not allowed). Enter Y to allow packet size negotiation. Both WDWNEG and PKTNEG (see above) must be set to Y to allow FCPN. ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Idle Channel Timer T3, LAPB	
Idle channel timer	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter IDLPBT3. At the IDLPBT3 prompt, enter the value. Value is 1 to 30, in units of seconds. Default is 5. ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Incoming Calls Barred and Incoming Calls Barred to the Cug	
Incoming calls barred	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter OUTONLY. At the OUTONLY prompt, enter the value. Value is Y or N. Default is N (incoming calls allowed). Enter Y to bar incoming calls.

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 6 of 13)

Bellcore-defined service	
CUG incoming access barred	Use the ADDPH or CHAPH command in SERVORD. At the CHA_OPTION prompt, enter CUG. When SERVORD prompts for a CUG_PARM, enter INCCALLS. At the INCCALLS prompt, enter the value. Value is Y or N. Default is Y (incoming calls allowed). Enter N to bar incoming calls.
Incoming Default Throughput Class (in bps)	
Master end receive throughput class	Use the ADDPH or CHAPH command in SERVORD. At the CHA_OPTION prompt, enter PVC. When SERVORD prompts for a PVC_PARM, enter MRECVTPT. At the MRECVTPT prompt, enter the value. Value is 3 to 10 if one of the endpoints is LAPD X.25, or 3 to 13 if both endpoints are either LAPB X.25 or X.75. Default is 10 (9600). ***Note:*** To add or change PVC parameters, the LTID must be detached from the LEN.
Incoming Maximum Packet Size	
Master end maximum receiving packet size	Use the ADDPH or CHAPH command in SERVORD. At the ADD/CHA_OPTION prompt, enter PVC. When SERVORD prompts for a PVC_PARM, enter MRECVPKT. At the MRECVPKT prompt, enter the value. Value is 128 or 256. Default is 128. ***Note:*** To add or change PVC parameters, the LTID must be detached from the LEN.
Incoming Window Size	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 7 of 13)

Bellcore-defined service	
Incoming packet layer window size	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter RXWDW. At the RXWDW prompt, enter the value. Value is 1 to 7 for MOD8, or 1 to 127 for MOD128. Default is 2. ***Note:*** To change the value of the RXWDW parameter, the LTID must be detached from the LEN.
Master end receiving window size	Use the ADDPH or CHAPH command in SERVORD. At the ADD/CHA_OPTION prompt, enter PVC. When SERVORD prompts for a PVC_PARM, enter MRECVWDW. At the MRECVWDW prompt, enter the value. Value is 1 to 7. Default is 2. ***Note:*** To add or change PVC parameters, the LTID must be detached from the LEN.
Interexchange Carrier Preselection	
Interexchange carrier subscription	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter RPOAPDNIC. At the RPOAPDNIC prompt, enter the value. Value is a 4-digit code. No default.
Interlock Code Which Identifies The Cug	
Data network identification code	Use the ADDPH or CHAPH command in SERVORD. At the ADD/CHA_OPTION prompt, enter CUG. When SERVORD prompts for a CUG_PARM, enter CUGDNIC. At the CUGDNIC prompt, enter the value. Value is 0 to 9999. No default.
Interlock code	Use the ADDPH or CHAPH command in SERVORD. At the ADD/CHA_OPTION prompt, enter CUG. When SERVORD prompts for a CUG_PARM, enter CUGNUM. At the CUGNUM prompt, enter the value. Value is 0 to 65 535. No default.
Link Layer Frame Sequencing, LAPB	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 8 of 13)

Bellcore-defined service	
Link level frame sequencing	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter LNKPROC. At the LNKPROC prompt, enter the value. Value is LAPB_DCE (MOD8) or LAPBE_DCE (MOD128). Default is LAPB_DCE (MOD8). ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Link Layer Window Size, LAPB	
Link level window size	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter FRMWDWK. At the FRMWDWK prompt, enter the value. Value is 1 to 127 if LNKPROC is LAPBE_DCE (MOD128), or 1 to 7 if LNKPROC is LAPB_DCE (MOD8). Default is 7. ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Local Charge Prevention	
Local charging prevention	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter OUT. At the OUT prompt, enter the value. Value is Y or N. Default is Y (permit charging). Enter N to prohibit charging to local DN.
Logical Channel Assignment for D-channel	
Start logical channel number	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPD_PARM, enter LCNBASE. At the LCNBASE prompt, enter the value. Value is 1 to 511. Default is 1.
Number of permanent virtual circuits	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPD_PARM, enter NUMPVC. At the NUMPVC prompt, enter the value. Value is 0 to 64. Default is 0.

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 9 of 13)

Bellcore-defined service	
Number of one-way incoming logical channels	Use the SETPH command in SERVORD. When SERVORD prompts for LAPD_PARM, enter NUMIVC. At the NUMIVC prompt, enter the value. Value is 0 to 64. Default is 0.
Number of non-restricted channels	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPD_PARM, enter NUMLCN. At the NUMLCN prompt, enter the value. Value is 1 to 64. Default is 1.
Number of one-way outgoing logical channels	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPD_PARM, enter NUMOVC. At the NUMOVC prompt, enter the value. Value is 0 to 64. Default is 0. ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Logical Channel Assignment for Nailed-up B-channels	
Start logical channel number	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter LCNBASE. At the LCNBASE prompt, enter the value. Value is 1 to 1024. Default is 1.
Number of permanent virtual circuits	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter NUMPVC. At the NUMPVC prompt, enter the value. Value is 0 to 512. Default is 0.
Number of one-way incoming logical channels	Use the SETPH command in SERVORD. When SERVORD prompts for LAPB_PARM, enter NUMIVC. At the NUMIVC prompt, enter the value. Value is 0 to 512. Default is 0.
Number of non-restricted channels	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter NUMLCN. At the NUMLCN prompt, enter the value. Value is 1 to 512. Default is 1.

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 10 of 13)

Bellcore-defined service	
Number of one-way outgoing logical channels	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter NUMOVC. At the NUMOVC prompt, enter the value. Value is 0 to 512. Default is 0. ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Maximum Bits In An Information Frame, LAPB	
Maximum bits in an information frame	None. Value is hard coded.
Maximum Number of Attemps to Complete a Successful Transmission, LAPB	
Maximum number of re-transmissions	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter RETRYN2. At the RETRYN2 prompt, enter the value. Value is 2 to 15. Default is 3. ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Outgoing Calls Barred and Outgoing Calls Barred to the Cug	
Outgoing calls barred	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter INONLY. At the INONLY prompt, enter the value. Value is Y or N. Default is N (outgoing calls allowed). Enter Y to bar outgoing calls.
CUG outgoing access barred	Use the ADDPH or CHAPH command in SERVORD. At the CHA_OPTION prompt, enter CUG. When SERVORD prompts for a CUG_PARM, enter OUTCALLS. At the OUTCALLS prompt, enter the value. Value is Y or N. Default is Y (outgoing calls allowed). Enter N to bar outgoing calls.
Outgoing Default Throughput Class (in bps)	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 11 of 13)

Bellcore-defined service	
Master end send throughput class	Use the ADDPH or CHAPH command in SERVORD. At the CHA_OPTION prompt, enter PVC. When SERVORD prompts for a PVC_PARM, enter MSENDTPT. At the MSENDTPT prompt, enter the value. Value is 3 to 10 if one of the endpoints is LAPD X.25, or 3 to 13 if both endpoints are either LAPB X.25 or X.75. Default is 10 (9600). ***Note:*** To add or change PVC parameters, the LTID must be detached from the LEN.
Outgoing Maximum Packet Size	
Master end maximum sending packet size	Use the ADDPH or CHAPH command in SERVORD. At the ADD/CHA_OPTION prompt, enter PVC. When SERVORD prompts for a PVC_PARM, enter MSENDPKT. At the MSENDPKT prompt, enter the value. Value is 128 or 256. Default is 128. ***Note:*** To add or change PVC parameters, the LTID must be detached from the LEN.
Outgoing Window Size	
Outgoing packet layer window size	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA.When SERVORD prompts for a DNA_PARM, enter TXWDW. At the TXWDW prompt, enter the value. Value is 1 to 7 for MOD8, or 1 to 127 for MOD128. Default is 2. ***Note:*** To change the value of the TXWDW parameter, the LTID must be detached from the LEN.

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 12 of 13)

Bellcore-defined service	
Master end sending window size	Use the ADDPH or CHAPH command in SERVORD. At the ADD/CHA_OPTION prompt, enter PVC. When SERVORD prompts for a PVC_PARM, enter MSENDWDW. At the MSENDWDW prompt, enter the value. Value is 1 to 7. Default is 2. ***Note:*** To add or change PVC parameters, the LTID must be detached from the LEN.
Packet Layer Sequencing	
Packet level sequencing	Assign a PLSQ value to a DN/channel type in table DNCHNL using the table editor. Edit field PLSQ. Value is MOD8 or MOD128.
Preferential Closed User Group	
Preferential closed user group	Use the ADDPH or CHAPH command in SERVORD. At the ADD/CHA_OPTION prompt, enter CUG. When SERVORD prompts for a CUGINDEX, enter 0. When SERVORD prompts for a CUG_PARM, enter PCUG. At the PCUG prompt, enter Y. Value is Y or N. Default is N.
Recognized Private Operating Administration Selection Barred	
Recognized private operating administration barred	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter EXPLRPOA. At the EXPLRPOA prompt, enter the value. Value is Y or N. Default is Y (permit selection). Enter N to bar RPOA selection.
Response Timer T2, LAPB	

Changing Packet Service Defaults (continued)

NI-1 packet service parameters (Sheet 13 of 13)

Bellcore-defined service	
Response timer	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM, enter RESPDTMR. At the RESPDTMR prompt, enter the value. Value is 0 to 4, where one unit equals 100 ms. Default is 2 (.2 s). ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.
Reverse Charging Acceptance	
Reverse charging acceptance	Use the CHAPH command in SERVORD. At the CHA_OPTION prompt, enter DNA. When SERVORD prompts for a DNA_PARM, enter INNPRC. At the INNPRC prompt, enter the value. Value is Y or N. Default is N (reverse charge not accepted).
Throughput Class Negotiation	
Throughput class negotiation	Use the SETPH command in SERVORD. When SERVORD prompts for a LAPB_PARM or LAPD_PARM, enter TPTNEG. At the TPTNEG prompt, enter the value. Value is Y or N. Default is N (not allowed). ***Note:*** The LTID must be detached from the LEN before the SETPH command is allowed.

Translations table o w

Not applicable

Limitations and restrictions

Changing Packet Service Defaults has no limitations or restrictions.

Interactions

Changing Packet Service Defaults has no functionality interactions.

Changing Packet Service Defaults (continued)

Activation/deactivation by the end user

Changing Packet Service Defaults requires no activation or deactivation by the end user.

Billing

Changing Packet Service Defaults does not affect billing.

Station Message Detail Recording

Changing Packet Service Defaults does not affect Station Message Detail Recording.

Data lling of ce parameter s

Changing Packet Service Defaults does not affect of ce parameters.

Data ll sequence

The following table lists the tables that require data ll to implement Changing Packet Service Defaults. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for Changing Packet Service Defaults

Datafill table	Example data
SVCDATA	Contains the default values for DNA, LAPB, and LAPD parameters, storing the set-table defaults for tables DNCTINFO and DNCHNL. This table also contains switch-wide parameters for ISDN PH tuples.
DNCTINFO	Stores packet data parameters associated with a DN and layer 3 packet services. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.
DNCHNL	Contains DNA parameters for packet service DNs. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

Table Editor for DNCTINFO and DNCHNL

Table control for table DNCHNL permits the craftsperson to change packet channel pro le attributes without unmapping and remapping the terminal. This capability applies to established logical terminals. The craftsperson can make changes using either SERVORD or the Table Editor interface.

Changing Packet Service Defaults (continued)

When using the Table Editor, the following limitations apply:

- When the craftsperson modi es link-af fecting parameters, either the corresponding line must be in the busy state or the terminal must be unmapped, otherwise the system rejects the tuple update.
- When the craftsperson modi es call af fecting parameters and calls are in progress on the link, the system issues an information message and the changes take effect on the next call.

Table control for table DNCTINFO permits the craftsperson to change packet channel pro le attributes without unmapping and remapping the terminal. This capability applies to established logical terminals. Table control displays an information message when the craftsperson changes parameters and calls are in progress on the link. This message indicates that the changes take effect on the next call. The craftsperson can make changes using either SERVORD or the Table Editor interface.

Data lling tab le SVCDATA

Table SVCDATA contains default DNA, LAPB, and LAPD parameter values for the switch. These parameters are contained in the following tuples:

- the tuple identi ed by eld name DNCTINFO contains the defaults for the service parameters in table DNCTINFO
- the tuple identi ed by eld name DNCHNB contains the def aults for the DNA and LAPB protocol parameters in table DNCHNL
- the tuple identi ed by eld name DNCHND contains the def aults for the DNA and LAPD protocol parameters in table DNCHNL

At load-build time, table SVCDATA contains the NI-1 standard defaults in these three tuples, but they can be altered by the operating company as required. Once the tuples in table SVCDATA are altered, these values, rather than the original default values, will appear in tables DNCTINFO and DNCHNL when the individual DNs are created.

The data ll for table SVCDATA is described in the section “ISDN BRI of ce con guration tables."

Translation veri cation tools

Changing Packet Service Defaults does not use translation veri cation tools.

SERVORD

Service orders are used to

- change default DNA parameters
- change default LAPB or LAPD parameters

Table DNCTINFO contains the default DNA, LAPB, and LAPD parameters for packet service DNs. These parameters are listed in the tables in the Operation section. Refer to “SERVORD examples" for an example of how to change the defaults in table DNCTINFO using the SERVORD command CHAPH.

Table DNCHNL contains the default DNA, LAPB, and LAPD parameters for packet service DNs. These parameters are listed in the tables in the Operation section. Refer to “SERVORD examples" for an example of how to change the defaults in table DNCHNL using the SERVORD command SETPH.

SERVORD limitations and restrictions

Changing Packet Service Defaults has no SERVORD limitations and restrictions.

SERVORD prompts

The following table shows the SERVORD prompts used to change default values of the DNA parameters.

SERVORD prompts for Changing Packet Service Defaults (Sheet 1 of 2)

Prompt	Valid input	Explanation
CHA_OPTION	DNA, PVC, CUG	Change option. Enter DNA to change DNA parameters.
DNASPEC	the data network address, or DN (1 to 15 digits)	DNA specification. Enter the DN to which the parameters apply.

Changing Packet Service Defaults (continued)

SERVORD prompts for Changing Packet Service Defaults (Sheet 2 of 2)

Prompt	Valid input	Explanation
NPI	E164, X121	Numbering plan indicator. Enter the numbering plan indicator to which the DN belongs.
DNA_PARM	a DNA parameter (refer to the list in table DNA parameters)	DNA parameter. Enter the DNA parameter to be changed.

The following table shows the service order prompts used to change default values of the LAPB or LAPD parameters.

SERVORD prompts for Changing Packet Service Defaults

Prompt	Valid input	Explanation
LAPB_PARM	a LAPB parameter (refer to the list in table LAPB parameters)	LAPB parameter. Enter the LAPB parameter to be changed.
LAPD_PARM	a LAPD parameter (refer to the list in table LAPD parameters)	LAPD parameter. Enter the LAPD parameter to be changed.
LTID	a logical terminal group name (1 to 8 alphanumeric characters) followed by a space and a terminal number (1 to 1022)	Logical terminal ID. Enter the LTID that identifies the logical terminal whose parameters are being changed.

SERVORD examples for Changing Packet Service Defaults

The following service order example shows how a default DN parameter is changed using the CHAPH command.

Changing Packet Service Defaults (continued)

SERVORD example for setting up DN parameters using CHAPH in prompt mode

```
>CHAPH
SONUMBER: NOW 99 11 06 AM
> (CR)
LTID:
> ISDN223
CHA_OPTION:
> DNA
DNASPEC:
> 6132243556
NPI:
> E164
DNA_PARM:
> RECVTPT
RECVTPT
> 6
DNA_PARM:
> $
CHA_OPTION:
> $
```

SERVORD example for setting up DN parameters using CHAPH in no-prompt mode

```
> CHAPH $ ISDN 223 DNA 6132243556 E164 RECVTPT 6 $ $
```

The following service order example shows how a default LAPB parameter is changed using the SETPH command. (The same command process is used to change default LAPD parameters.)

Changing Packet Service Defaults (end)

SERVORD example for setting up LAPB/LAPD parameters using SETPH in prompt mode

```
>SETPH
SONUMBER: NOW 98 03 03 PM
> (CR)
LTID:
> ISDN44
LAPB_PARM:
> LCNBASE:
LCNBASE:
> 4
LAPB_PARM:
> NUMLCN
NUMLCN
> 2
LAPB_PARM:
> NUMOVC
 NUMOVC
> 1
LAPB_PARM:
> $
```

SERVORD example for setting up LAPB/LAPD parameters using SETPH in no-prompt mode

```
> SETPH $ ISDN 44 LCNBASE 4 NUMLCN 2 NUMOVC 1 $
```

Packet Closed User Groups

Functionality code

Functional group ordering code: NI000010

Release applicability

BCS36 and up

Prerequisites

To operate, the Packet Closed User Groups functionality requires the following functional groups:

- NI0 ISDN Base—NI000007
- NI0 NI-1 BRI—NI000008
- MDC Minimum—MDC00001

Description

A Closed User Group (CUG) is a group of terminals whose members have access only to speci ed resources. F or example

- a CUG could be con gured to e xclude access from outside the group
- a CUG could be con gured to access only the terminals within the group and a single offsite database, but one member of the group could be given incoming access from outside the group
- a CUG could be restricted from accessing two mainframe computers in a group of ve, but allowed access to the other three

A terminal can be a member of a maximum of 100 CUGs. An index number is associated with each CUG to identify the CUG in call requests. When a terminal is a member of more than one CUG, a preferential CUG can be speci ed to act as the def ault for calls that do not have an identi ed CUG.

Note: The preferential CUG must be provisioned with an index (CUGINDEX) of 0.

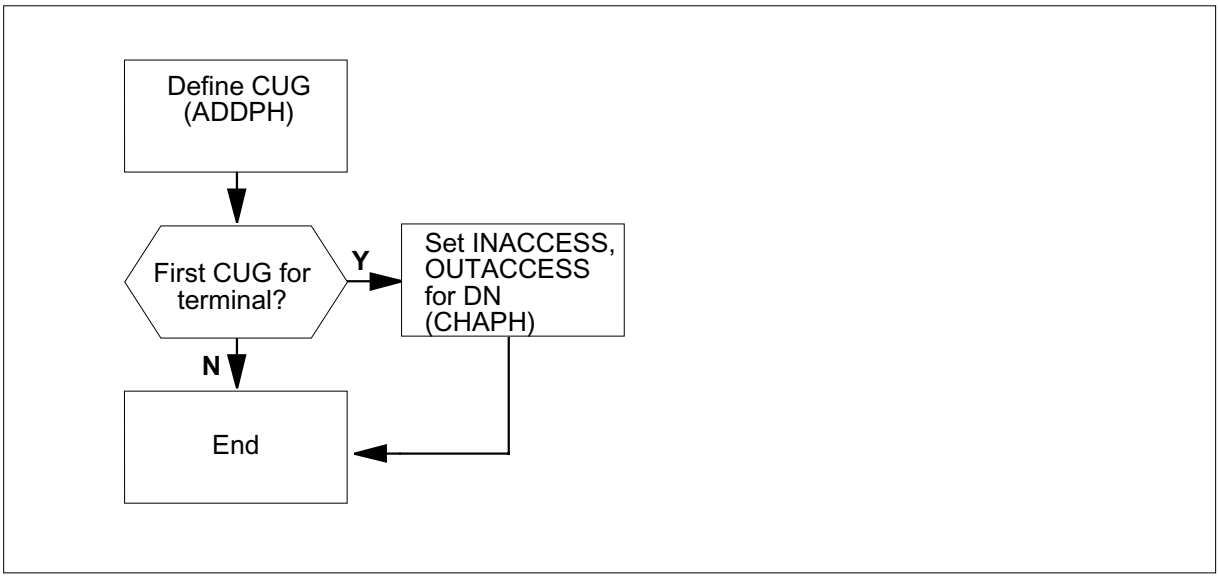
Although the typical CUG is an X.25-based service, it is also possible to de ne X.75 CUG service for network traf c control purposes. In this case, CUGs are also provisioned on each trunk group that is to have screened call access. Each trunk group can have a list of up to 100 CUGs associated with it. Outgoing call screening for an X.75 CUG is speci ed using eld CUGSCR in table TRKSGRP.

Packet Closed User Groups (continued)

Operation

A terminal can be assigned to one or more CUGs through SERVORD subscription. SERVORD automatically data lls tables CUGINFO and DNCTINFO with the CUG provisioning information. The following gure illustrates the process of provisioning a CUG, and the “CUG parameters” table lists the CUG parameters.

Table o w for Packet Closed User Groups - Provisioning a CUG



The main CUG parameters, which are de ned in table CUGINFO, are speci ed with the SER VORD command ADDPH. Table CUGINFO lists all the CUGs of which the terminal is a member, identifying each CUG by an index number, and stating the type of CUG as X.25 or X.75. The table also speci es the supplementary CUG f acilities as

- outgoing calls barred within a CUG (CUGOAB)
- incoming calls barred within a CUG (CUGIAB)

When de ning the rst CUG for a terminal, further parameters must be de ned in table DNCTINFO. The DNCTINFO parameters specify the type of access available to CUG members, and apply to all the CUGs associated with that DN. One of four basic types of service is de ned in table DNCTINFO:

- ordinary closed user group (OCUG)
- closed user group with outgoing access (CUGOA)
- closed user group with incoming access (CUGIA)
- closed user group with outgoing and incoming access (CUGOAIA)

Packet Closed User Groups (continued)

The information in DNCTINFO is automatically data lled depending on the responses to the SERVORD parameters INACCESS and OUTACCESS during the CHAPH command. Table DNCTINFO also speci es whether there is a preferential CUG, if the terminal is a member of more than one CUG.

CUG parameters

SERVORD parameter	DMS parameter	Table affected	Field affected
CUGDNIC	data network identification code	CUGINFO	DNIC
CUGINDEX	CUG index	CUGINFO	CUGIDX
CUGNUM	interlock code	CUGINFO	ITLK
DNASPEC	directory number	CUGINFO	DN
INCCALLS	CUG incoming access barred	CUGINFO	CUGIAB
OUTCALLS	CUG outgoing access barred	CUGINFO	CUGOAB
PCUG	preferential CUG	DNCTINFO	PRFCUG

Translations table o w

Not applicable

Limitations and restrictions

Packet Closed User Groups has no limitations or restrictions.

Interactions

Packet Closed User Groups has no functionality interactions.

Activation/deactivation by the end user

Packet Closed User Groups requires no activation or deactivation by the end user.

Billing

Packet Closed User Groups does not affect billing.

Station Message Detail Recording

Packet Closed User Groups does not affect Station Message Detail Recording (SMDR).

Data lling of ce parameter s

Packet Closed User Groups does not affect of ce parameters.

Packet Closed User Groups (continued)

Data ll sequence

The following table lists the tables that require data ll to implement P acket Closed User Groups. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for Packet Closed User Groups

Table	Purpose of table
DNCTINFO	Contains CUG provisioning information that applies to all CUGs defined for the DN. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD” for an example of using SERVORD to datafill this table.
CUGINFO	Contains a list of all the CUGs in which the DNor X.75 trunk is a member, and describes the services of each CUG. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD” for an example of using SERVORD to datafill this table.
TRKSGRP	Specifies whether to perform call screening for outgoing calls on X.75 trunk groups.

Data lling tab le TRKSGRP

Table TRKSGRP speci es whether to perform call screening for outgoing calls on X.75 CUG trunk groups.

The following table shows the data ll speci c to P acket Closed User Groups for table TRKSGRP. Only those elds that apply directly to P acket Closed User Groups are shown. For a description of the other elds, refer to the *Data Schema Reference Manual*.

Data lling tab le TRKSGRP (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
SGRPKEY		see subfields	Subgroup key. This field contains subfields CLLI and SGRP.
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. Enter the trunk CLLI.
	SGRP	0 or 1	Subgroup. Enter the trunk subgroup identifier.
CARDCODE		DS1SIG	Card code. Enter DS1SIG for X.75 packet applications.

Packet Closed User Groups (continued)

Data lling tab le TRKSGRP (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
SGRPVAR		X75	Subgroup variable. Enter X75 for X.75 packet applications, and datafill refinements VERSION and CUGSCR.
	VERSION	X75 or X75P	Version. Enter X75 to specify the CCITT X.75 packet switch trunk protocol standard. Enter X75P to specify the CCITT X.75' packet switch trunk protocol standard.
	CUGSCR	Y or N	CUG screening. Enter Y to specify that the trunk performs CUG screening on outgoing CUG calls. Otherwise, enter N.

Data ll e xample for table TRKSGRP

The following example shows sample data ll for table TRKSGRP

MAP display example for table TRKSGRP

```
          SGRPKEY   CARDCODE
SGRPVAR
                                                    SGRPVAR

_____________________________________________________________________

  RPOA3333E164 0    DS1SIG
    X75                              X75 N Y Y N Y Y N N
```

Translation veri cation tools

Packet Closed User Groups does not use translation veri cation tools.

SERVORD

Service orders are used to

- provision a CUG
- specify CUG characteristics for the DN

Table CUGINFO lists the CUG memberships for a DN or trunk, and describes the service of each CUG. The table lists each CUG of which the DN or trunk is a member, identifying the CUG by a DN and an index number (for X.25 CUGs) or a CLLI and index number (for X.75 CUGs).

Within the network, each CUG is identi ed by a data netw ork identi cation code (DNIC or INIC) and an interlock code, which identi es the CUG within

Packet Closed User Groups (continued)

the network. For internetwork CUGs, administrations must agree on DNICs or INICs and interlock codes.

Table CUGINFO also allows one of the following supplementary services for a CUG to be de ned:

- outgoing calls barred within a CUG (CUGOAB)
- incoming calls barred within a CUG (CUGIAB)

Refer to "SERVORD example" for an example of how to data ll table CUGINFO using the SERVORD command ADDPH.

Table DNCTINFO contains the provisioning information that applies to all CUGs de ned for the DN. The CUG service is de ned in tw o elds: CUGS indicates whether or not the DN is part of a CUG, and CUGFSEL indicates the type of access de ned for the CUG as one of the follo wing groups:

- ordinary closed user group (OCUG)
- closed user group with outgoing access (CUGOA)
- closed user group with incoming access (CUGIA)
- closed user group with outgoing and incoming access (CUGOAIA)

The CUGS eld is automatically set to Y when a tuple is entered in table CUGINFO, indicating that the DN is a member of a CUG. The information in the CUGFSEL eld is automatically data lled depending on the responses to the SERVORD parameters INACCESS and OUTACCESS during the CHAPH command:

- CUGFSEL is set to OCUG if INACCESS and OUTACCESS are set to N (and CUGS is already set to Y)
- CUGFSEL is set to CUGOA if INACCESS is set to N and OUTACCESS is set to Y
- CUGFSEL is set to CUGIA if INACCESS is set to Y and OUTACCESS is set to N
- CUGFSEL is set to CUGOAIA if INACCESS and OUTACCESS are set to Y

Note: The CUGS eld may also be set to Y if IN ACCESS and OUTACCESS are set to Y, even though there is no data ll in table CUGINFO.

If the terminal is a member of more than one CUG, table DNCTINFO also speci es whether a preferential CUG has been designated. The PRFCUG eld

Packet Closed User Groups (continued)

in table DNCTINFO is updated depending on the response to the PCUG parameter in the ADDPH command in SERVORD.

Refer to “SERVORD example” for an example of how to data ll table DNCTINFO using the SERVORD command CHAPH.

SERVORD limitations and restrictions

Packet Closed User Groups has no SERVORD limitations and restrictions.

SERVORD prompts

The following table shows the SERVORD prompts used to provision a CUG using the ADDPH command.

SERVORD prompts for provisioning Packet Closed User Groups (Sheet 1 of 2)

Prompt	Valid input	Explanation
ADD_OPTION	DNA, PVC CUG	Add option. Enter CUG to provision a CUG.
CUGINDEX	0 to 99	Closed user group index. Enter the index number for the CUG.
CUGNUM	0 to 65535	Closed user group number. Enter the number of the CUG. (This field corresponds to the ITLK field in table CUGINFO.)
CUG_PARM	a CUG parameter (refer to the list in the “CUG parameters” table)	Closed user group parameter. Enter the CUG parameter to be defined.
DNASPEC	the data network address or DN (1 to 15 digits)	Data network address. Enter the DN associated with the CUG.

Packet Closed User Groups (continued)

SERVORD prompts for provisioning Packet Closed User Groups (Sheet 2 of 2)

Prompt	Valid input	Explanation
LTID	a logical terminal group name (1 to 8 alphanumeric characters), followed by a space and a terminal number (1 to 1022)	Logical terminal identifier. Enter the LTID that will identify the logical terminal associated with the CUG.
NPI	E164, X121	Numbering plan identifier. Enter the numbering plan indicator to which the DN belongs.

The following table shows the service order prompts used to assign values to the CUG parameters.

SERVORD prompts for assigning CUG parameters

Prompt	Valid input	Explanation
CHA_OPTION	DNA, PVC CUG	Change option. Enter CUG to change CUG parameters.
DNASPEC	the data network address or DN (1 to 15 digits)	Data network address. Enter the DN to which the parameters apply.
NPI	E164, X121	Numbering plan indicator. Enter the numbering plan indicator to which the DN belongs.
CUG_PARM	a CUG parameter (refer to the “CUG parameters” table)	Closed user group option. Enter the CUG parameter to be changed.

SERVORD example for adding Packet Closed User Groups

The following SERVORD example shows how the CUG is de ned.

Packet Closed User Groups (continued)

SERVORD example for setting up Packet Closed User Groups using ADDPH in prompt mode

```
SO:
> ADDPH
SONUMBER: NOW 93 4 7 PM
>
LTID:
> ISDN 50
ADD_OPTION:
> CUG
CUGNUM:
> 2345
CUGINDEX:
> 0
DNASPEC:
> 6136211234
CUG_PARM:
> CUGTYP
CUGTYP:
> I
CUGDNIC:
> 3333
CUG_PARM:
> PCUG
PCUG:
> Y
CUG_PARM:
> $
ADD_OPTION:
> $
```

SERVORD example for setting up Packet Closed User Groups using ADDPH in no-prompt mode

```
>ADDPH $ ISDN 50 CUG 2345 0 6136211234 CUGTYP I 3333
PCUG Y $ $
```

The following service order example shows how the DN-associated CUG parameters (de ned in table DNCTINFO) are de ned using the CHAPH command.

Packet Closed User Groups (end)

SERVORD example for setting up DN defaults using CHAPH in prompt mode

```
>CHAPH
SONUMBER: NOW 97 01 06 AM
>
LTID:
> ISDN 22
CHA_OPTION:
> CUG
CUGINDEX:
> 0
DNASPEC:
> 6132243555
NPI:
> E164
CUG_PARM:
> INCCALLS
INCCALLS:
> Y
CUG_PARM:
> OUTCALLS
OUTCALLS:
> Y
CUG_PARM:
> $
CHA_OPTION:
> $
```

SERVORD example for setting up DN defaults using CHAPH in no-prompt mode

```
>CHAPH $ ISDN 22 CUG 0 6132243555 E164 INCCALLS Y
OUTCALLS Y $ $
```

Packet Hunt Groups

Functionality code

Functional group ordering code: NI000010

Release applicability

BCS36 and up

Prerequisites

To operate, the Packet Hunt Groups functionality requires the following functional groups:

- NI0 ISDN Base—NI000007
- NI0 NI-1 BRI—NI000008
- MDC Minimum—MDC00001

Description

BRI packet terminals can be provisioned in two types of hunt group: a multiline hunt group (MLH), or a distributed line hunt group (DLH):

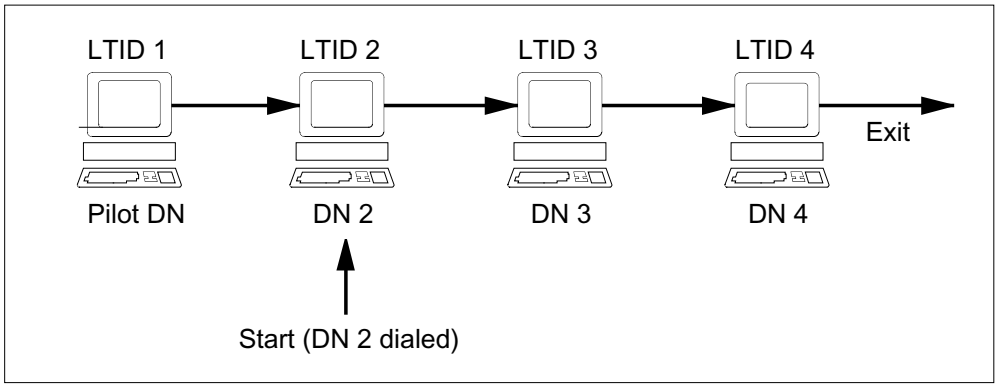
- in an MLH or linear hunt group (refer to gure “MLH hunt sequence"), each terminal is assigned a DN, and hunting begins with the called DN and continues through the hunt group DN order until an available member is found, or until the last member in the group is reached
- in a DLH or uniform hunt group (refer to gure “DLH hunt sequence")
  - — only the pilot terminal is assigned a hunt DN, and the other terminals in the group are assigned non-hunt DNs
  - — the rst hunt sequence be gins with the pilot terminal and continues through the hunt group order until an available member is found, or until the last member in the group is reached
  - — subsequent hunt sequences begin with the terminal in the group after the terminal that took the call in the previous hunt sequence, and continue until an available member is found or the last member in the group is reached (in this case, the last member is the terminal preceding the start hunt terminal)

The hunt order, in both cases, is the order in which the hunt terminals are added to the group in SERVORD.

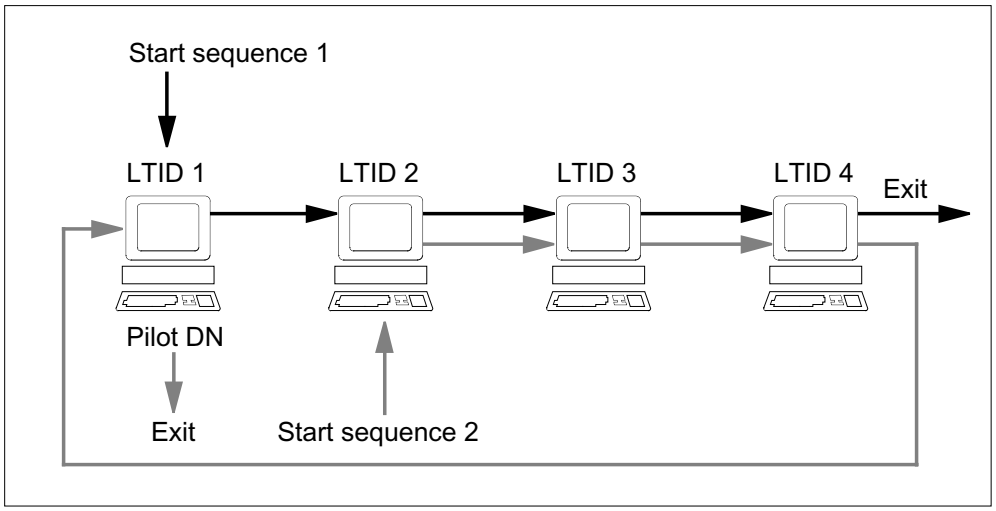
The MLH group is typically used when the operating company requires the ability to address a station in the hunt group by its DN, and then begin hunting if that station is busy. The DLH group is typically used when a uniform distribution of calls is required within a large hunt group.

Packet Hunt Groups (continued)

MLH hunt sequence



DLH hunt sequence



Operation

The following o wchart illustrates the procedure required to provision a hunt group. The process is as follows:

1. Create the group's pilot LTID with the SERVORD command SLT ADD.
2. Establish the hunt group using the SERVORD command EST. SERVORD automatically data lls table HUNTGRP with the group parameters, specifying the hunt group number, the pilot DN, and the type of hunt (MLH or DLH).
3. Create LTIDs for the members of the group using the SERVORD command SLT ADD.
4. Create DNs for the group members using the SERVORD command NEW.

Packet Hunt Groups (continued)

5. Add the members to the group using the SERVORD command ADD. SERVORD automatically data lls table HUNTMEM with the LTID of the member and the sequence number of the terminal in the group.

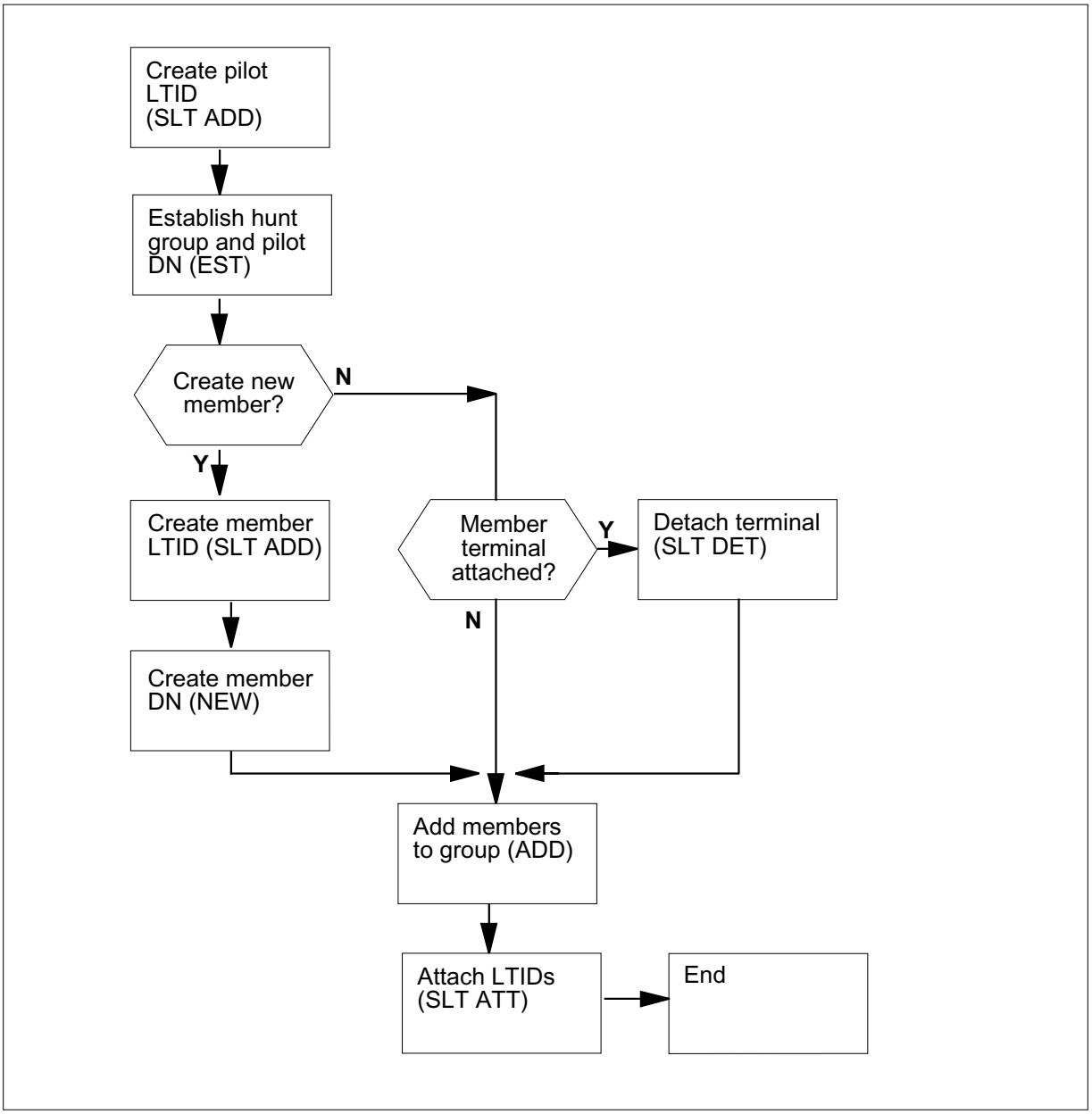
   Note: If a hunt terminal is already attached to a LEN, it must be detached (using SERVORD command SLT DET) before it is added to the group.

6. Attach the pilot LTID to its LEN, and the member LTIDs to their LENs, using the SERVORD command SLT ATT.

   Note: An example of this step is shown in the section “ISDN Basic Access."

Packet Hunt Groups (continued)

Provisioning a hunt group



Translations table o w

Not applicable

Limitations and restrictions

Not applicable

Packet Hunt Groups (continued)

Interactions

Not applicable

Activation/deactivation by the end user

Not applicable

Billing

Packet Hunt Groups does not affect billing.

Station Message Detail Recording

Packet Hunt Groups does not affect Station Message Detail Recording (SMDR).

Data lling of ce parameter s

Packet Hunt Groups does not affect of ce parameters.

Data ll sequence

The following table lists the tables that require data ll to implement P acket Hunt Groups. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for Packet Hunt Groups

Table	Purpose of table
HUNTGRP	Contains a list of hunt groups, and defines hunt group parameters. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.
HUNTMEM	Contains a list of the members of each hunt group. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

Translation veri cation tools

Packet Hunt Groups does not use translation veri cation tools.

SERVORD

SERVORD is used to

- establish a hunt group, with EST
- add members to the group, with ADD

Packet Hunt Groups (continued)

Table HUNTGRP contains a list of the hunt groups de ned for the switch. The table includes the identifying number assigned to the hunt group, the NPA and DN of the pilot member, the type of hunt group (MLH or DLH), and the maximum number of members permitted for the group. Refer to gure "SERVORD example for setting up hunt groups using EST in prompt mode" for an example of how to data ll table HUNTGRP using the SER VORD command EST.

Table HUNTMEM contains a list of the members in each hunt group. The table includes the LTID of the member and the sequence number of the terminal in the group. Refer to gigure "SERVORD example for setting up hunt groups using ADD in prompt mode" for an example of how to data ll table HUNTMEM using the SERVORD command ADD.

SERVORD limitations and restrictions

Not applicable.

SERVORD prompts

The following table shows the SERVORD prompts used to establish Packet Hunt Groups.

SERVORD prompts for establishing Packet Hunt Groups (Sheet 1 of 2)

Prompt	Valid input	Explanation
GROUPTYPE	MLH or DLH	Group type. Enter the type of hunt group to be established.
PILOT_DN	7 digits	Pilot directory number. Enter the DN of the pilot member.
LCC	ISDNKSET	Line class code. Enter ISDNKSET to specify the line class code of the pilot member.
GROUP	1 to 16 alphanumeric characters	Customer group. Enter the name of the customer group to which the pilot DN is assigned.
SUBGRP	0 to 7	Subgroup. Enter the number of the customer subgroup to which the pilot DN is assigned. (If subgroups are not being used, enter 0.)

Packet Hunt Groups (continued)

SERVORD prompts for establishing Packet Hunt Groups (Sheet 2 of 2)

Prompt	Valid input	Explanation
NCOS	0 to 511	Network class of service. Enter the number of the network class of service to which the pilot DN is assigned. (If NCOS grouping is not in use, enter 0.)
SNPA	3 digits	Serving NPA. Enter the serving numbering plan area (area code).
KEY	1 to 64	Key. Enter the number of the key associated with the pilot DN.
RINGING	Y or N	Ringing. Enter Y to specify that the terminal should ring, or N to specify that it should not ring.
LATANAME	alphanumeric carrier name (1 to 16 characters) or NILLATA	LATA name. Enter the name of the primary interexchange carrier to be associated with the pilot DN, or NILLATA to indicate that no carrier is to be associated with the DN. (The carrier name must be listed in table OCCNAME.)
PILOT_LEN	a logical terminal group name (alphanumeric 1 to 8 characters) followed by a space and a terminal number (1 to 1022)	Pilot LEN. Enter the LTID of the pilot member.
GROUPSIZE	0 to 1024	Group size. Enter the number of members permitted in the group.

Packet Hunt Groups (continued)

The following table shows the service order prompts used to add members to a hunt group.

SERVORD prompts for adding hunt group members

Prompt	Valid input	Explanation
GROUPTYPE	MLH or DLH	Group type. Enter the type of hunt group.
LINK_LEN	a logical terminal group name (alphanumeric 1 to 8 characters), followed by a space and a terminal number (1 to 1022)	Link LEN. Enter the LTID of the pilot member of the hunt group.
KEY	1 to 64	Key. Enter the number of the key associated with the member DN.
MEM_LEN	a logical terminal group name (alphanumeric 1 to 8 characters), followed by a space and a terminal number (1 to 1022)	Member LEN. Enter the LTID of the hunt group member.
GROUPSIZE	0 to 1024	Group size. Enter the number of members permitted in the group.

SERVORD example for implementing Packet Hunt Groups

The following SERVORD example shows how a hunt group is established.

Packet Hunt Groups (continued)

SERVORD example for setting up hunt groups using EST in prompt mode

```
SO:
> EST
SONUMBER: NOW 95 04 11
> (CR)
GROUPTYPE:
> DLH
PILOT_DN:
> 8383944
LCC:
> ISDNKSET
GROUP:
> CUSTB
SUBGROUP:
> 4
NCOS:
>10
SNPA:
> 613
KEY:
>1
RINGING:
>N
LATANAME:
>LATA1
PILOT_LEN:
>SDN 222
MEM_LEN:
>$
OPTION:
>$
GROUPSIZE:
>16
```

SERVORD example for setting up hunt groups using EST in no-prompt mode

```
>EST $ DLH 8383944 ISDNKSET CUSTB 4 10 613 1 N LATA1 ISDN
222 $ $ 16
```

The following service order example shows how members are added to a hunt group.

Packet Hunt Groups (end)

SERVORD example for setting up hunt groups using ADD in prompt mode

```
SO:
> ADD
SONUMBER: NOW 95 04 10
> (CR)
GROUPTYPE:
> DLH
LINK_LEN:
> ISDN 222
KEY:
> 1
MEM_LEN:
> ISDN 223
KEY:
> 4
MEM_LEN:
> ISDN 224
KEY:
> 1
MEM_LEN:
> $
OPTION:
> $
GROUPSIZE:
> 16
```

SERVORD example for setting up hunt groups using ADD in no-prompt mode

```
>ADD $ DLH ISDN 222 1 ISDN 223 4 ISDN 224 1 $ $ 16
```

Permanent Virtual Circuits

Functionality code

Functional group ordering code: NI000010

Release applicability

BCS36 and up

Prerequisites

To operate, the Permanent Virtual Circuits functionality requires the following functional groups:

- NI0 ISDN Base—NI000007
- NI0 NI-1 BRI—NI000008
- MDC Minimum—MDC00001

Description

A permanent virtual circuit (PVC) is a permanent logical connection between two endpoints in a network. An endpoint can be

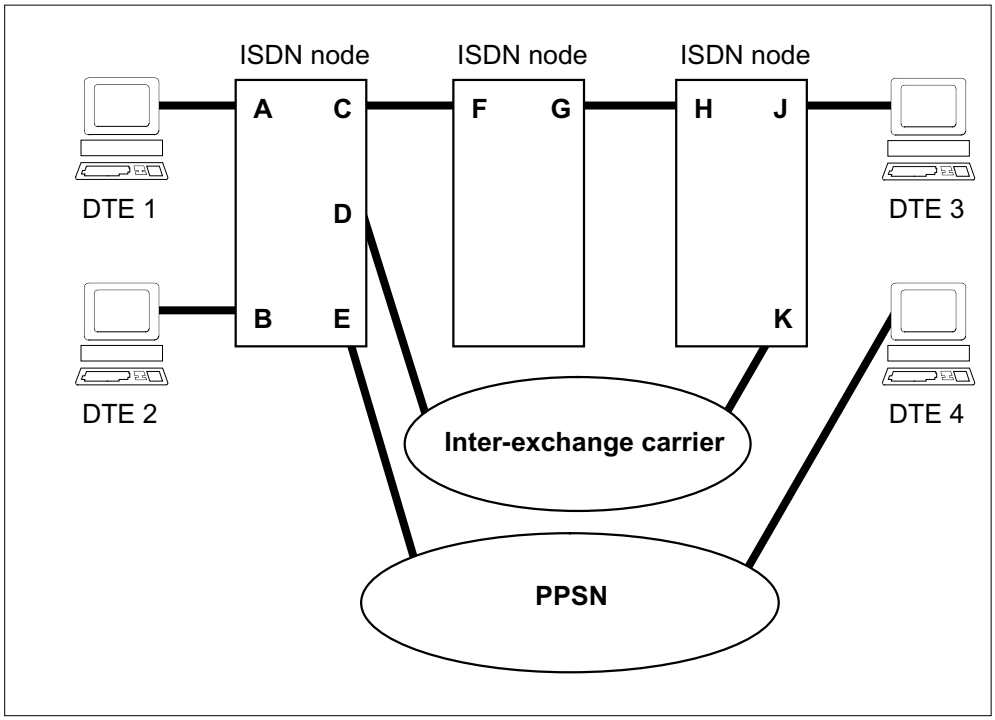
- an X.25 interface represented by
  - — a DN
  - — a channel type B or D
  - — a logical channel number (LCN)
- an X.75 interface represented by
  - — a CLLI
  - — a trunk member (MEMB)
  - — an LCN

For administrative purposes, one terminal is called the master end and the other is called the slave end.

A single PVC can be con gured only between end points on the same node. To con gure a PVC between end points on dif ferent nodes in the same administration, or across different administrations, a series of PVCs must be set up across the network. The following gure illustrates typical con gurations.

Permanent Virtual Circuits (continued)

Typical PVC con gurations



There are four basic con gurations illustrated in the abo ve gure.

- DTE 1 to DTE 2 (path A-B) is a local PVC in which the originating and terminating endpoints are in the same switch. Both endpoints are identi ed by a DN. The single path A-B is pro visioned.
- DTE 1 to DTE 3 (path A-C-F-G-H-J) is an inter-switch PVC in which the originating and the terminating endpoints are on different switches. In this case, three PVCs are provisioned to set up the end-to-end PVC: path A-C, path F-G, and path H-J.
- DTE 1 to DTE 4 (path A-E-PPSN-DTE 4) is between a terminal on an ISDN node and a terminal on a public packet switched network (PPSN). As in the previous example, at least two separate PVCs have to be set up to provide an end-to-end PVC. One PVC is required between DTE 1 and the outgoing trunk E. Another PVC is required in the PPSN between the gateway port and DTE 4. The DMS-100 switch administration sets up only the rst PVC; the PPSN administration sets up the PVCs between the incoming gateway and the terminal on the PPSN.
- DTE 1 to DTE 3 via IEC (path A-D-IEC-K-J) is set up if DTE 1 and DTE 3 are in different local access and transport areas (LATA). One PVC is set up from port A to port D. The second PVC is set up through the IEC between the trunk channel from port D and the trunk channel to port K.

The third PVC is set up from the incoming trunk channel on port K to port J, which provides access to DTE 3.

Three basic types of PVCs are supported within the DMS-100 switch to satisfy these paths:

- a line-to-line PVC (the A-B path)
- a line-to-trunk PVC (the A-C path between terminal DTE 1 and DTE 3)
- a trunk-to-trunk PVC (the F-G path between terminal DTE 1 and DTE 3)

Billing of PVCs is normally performed at the master end, and is only effective when the master is an X.25 endpoint. (One endpoint, typically the originating terminal, is de ned as the master endpoint in table PVCINFO.) Normal billing can be overridden by billing to a network user identi er (NUI) for those PVCs that span a single LATA. However, for inter-LATA PVC calls, a billing record can be generated at both endpoints.

PVC billing can also be disabled so that PVCs can be used to set up network managers or other administrative tools.

Operation

Provisioning a PVC depends on the type of PVC, which is one of

- an intranodal, or line-to-line, PVC
- an internodal, intra-network PVC
- an internetwork PVC

Typically, PVCs are provisioned using the service order (SERVORD) system. However, SERVORD is not used for trunk provisioning, so whenever both PVC endpoints are trunks, table data ll must be used for pro visioning that PVC. Table data ll is also used to specify PVC billing other than the default billing (in which the master end of the PVC is billed).

Provisioning an intranodal PVC

A typical intranodal (line-to-line) PVC is shown in the following gure. In this case, only a single line-to-line PVC needs to be provisioned.

The following gure illustrates the pro visioning procedure required to de ne the intranodal PVC. The process is as follows:

1. Ensure that the number of logical channels (LCNs) and the number of PVC channels de ned for each DN are suf cient to add a PVC to the DN. The query command QPHF (DN) can be used to determine the number of LCNs and PVC channels currently de ned for the DN in table DNCHNL.

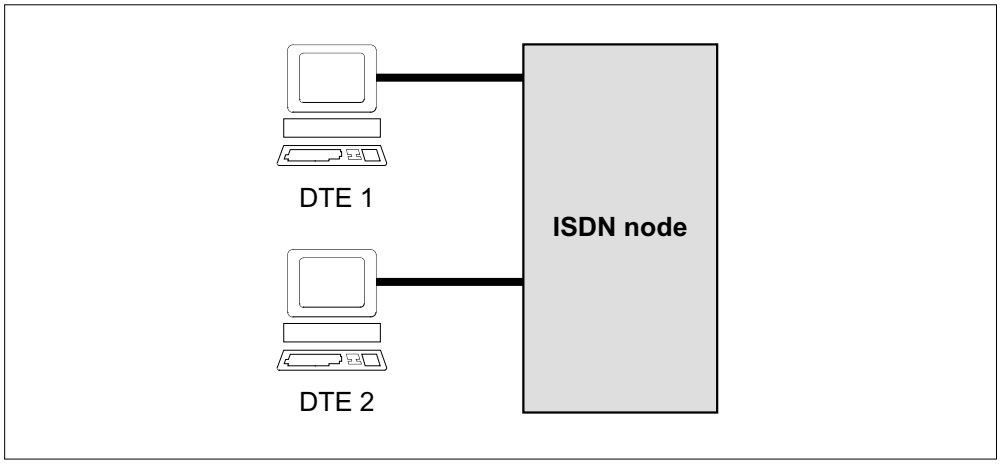
Permanent Virtual Circuits (continued)

If the number is insuf cient, the NUMLCN and NUMPVC parameters can be altered with SERVORD command SETPH. (Refer to the description of table DNCHNL in the section ``Data ll sequence".)

Note: If the terminal is attached to a LEN, it must be detached (using SERVORD command SLT DET) in order to change the logical channel assignment. Reattach the terminal to the LEN using the SERVORD command SLT ATT before proceeding.

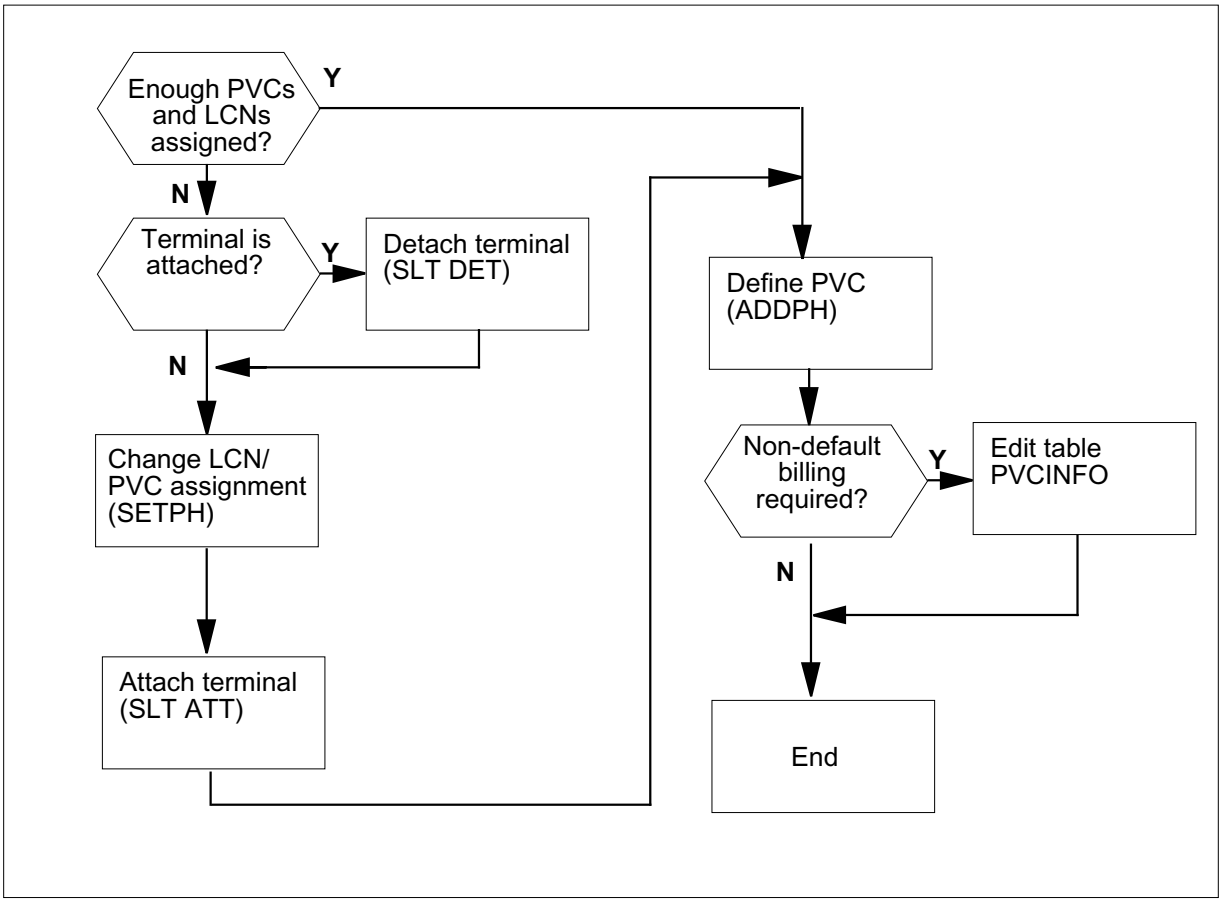
2. De ne the PVC with the SER VORD command ADDPH. SERVORD data lls table PVCINFO with the responses to ADDPH. (T able “PVC parameters" lists the PVC parameters de ned in table PVCINFO.)
3. If PVC billing other than the default (master end) billing is required, data ll table PVCINFO with the billing information.

Intranodal PVC



Permanent Virtual Circuits (continued)

Provisioning a PVC



PVC parameters (Sheet 1 of 2)

SERVORD parameter	DMS parameter	Table affected	Field affected
MRECVPKT	receive packet size	PVCINFO	RECVPS
MRECVTPT	receive throughput class	PVCINFO	RECVTC
MRECVWDW	receive window size	PVCINFO	RECVWS
MSENDPKT	send packet size	PVCINFO	SENDPS
MSENDTPT	send throughput class	PVCINFO	SENDTC
MSENDWDW	send window size	PVCINFO	SENDWS
ORIGDNA	master end identifier (DN)	PVCINFO	MSTEND DN

Permanent Virtual Circuits (continued)

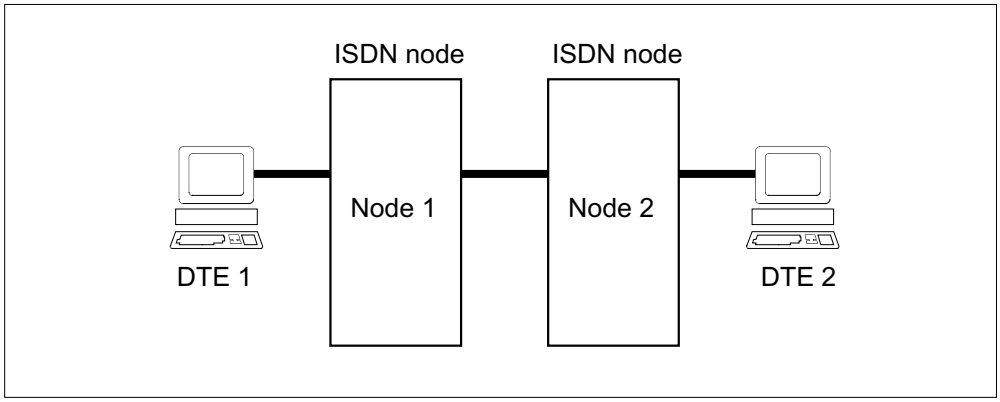
PVC parameters (Sheet 2 of 2)

SERVORD parameter	DMS parameter	Table affected	Field affected
ORIGLCN	master end identifier (LCN)	PVCINFO	MSTEND LCN
RESPDNA	slave end identifier (DN)	PVCINFO	SLVEND DN
RESPLCN	slave end identifier (LCN)	PVCINFO	SLVEND LCN

Provisioning an internodal PVC

A typical internodal, intranetwork PVC con guration is illustrated in the following gure. As sho wn in the illustration, an internodal PVC actually consists of two intranodal, line-to-trunk PVCs. These PVCs are provisioned using the same steps as for the intranodal PVC.

Internodal PVC



Note: It is assumed that the X.75 trunks associated with the PVCs are data lled in table X75INFO with a suf cient number of PVC channels.

If default billing is required, the X.25 endpoint of each PVC should be designated the master end. If NUI billing is required, table PVCINFO must be data lled with the PVC's local access and transport area (LA TA) status (intra-LATA) and the NUI charge number.

Provisioning an internetwork PVC

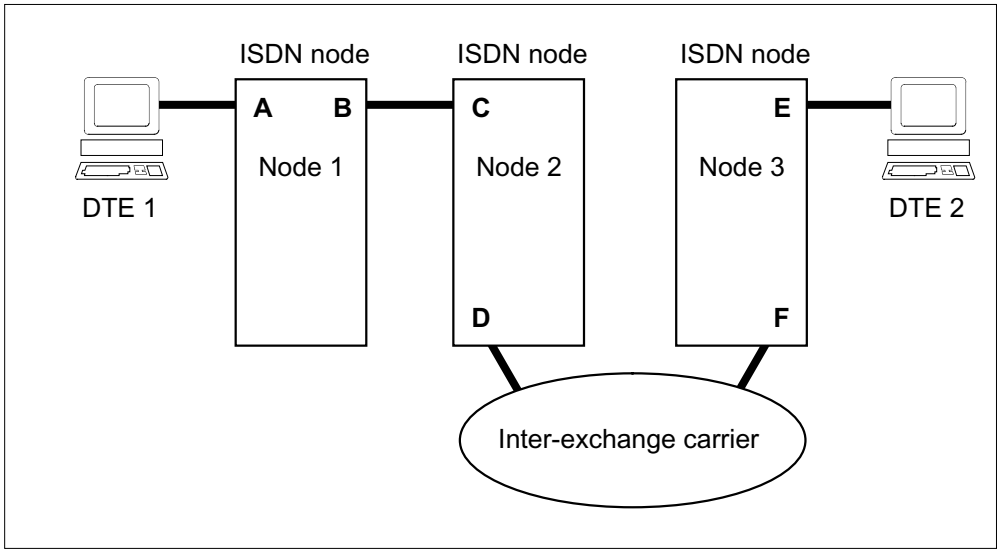
A typical internetwork PVC con guration is illustrated in the following gure. As shown in the illustration, an internodal PVC actually consists of at least three PVCs: two line-to-trunk PVCs, and a trunk-to-trunk PVC. In the example in the illustration, a fourth PVC is also required between the incoming trunk and the outgoing IEC at node 2. The trunk-to-trunk PVCs are set up by

Permanent Virtual Circuits (continued)

the appropriate IEC and LATA administrations with the same parameters (throughput class, packet size, window size) as the X.25 endpoints.

If default billing is required, the X.25 endpoint of each line-to-trunk PVC should be designated the master end. However, in an internetwork PVC, billing is typically required at more than one point in the chain. For inter-LATA billing, table PVCINFO can be data lled with the PVC's LA TA status (inter-LATA) and a charge number.

Internetwork PVC



Translations table o w

Not applicable

Limitations and restrictions

Permanent Virtual Circuits has no limitations or restrictions.

Interactions

Permanent Virtual Circuits has no functionality interactions.

Activation/deactivation by the end user

Permanent Virtual Circuits requires no activation or deactivation by the end user.

Billing

Permanent Virtual Circuits does not affect billing.

Permanent Virtual Circuits (continued)

Station Message Detail Recording

Permanent Virtual Circuits does not affect Station Message Detail Recording.

Data lling of ce parameter s

Permanent Virtual Circuits does not affect of ce parameters.

Data ll sequence

The following table lists the tables that require data ll to implement Permanent Virtual Circuits. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for Permanent Virtual Circuits

Table	Purpose of table
DNCHNL	Contains the number of logical channels and PVC channels available to the DN. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.
PVCINFO	Contains PVC service parameters and billing information. For PVC service parameters, this table should be datafilled through service orders only. (Billing information, other than default billing, must be datafilled directly.)

Data lling tab le PVCINFO

CAUTION
Service may be affected
Use SERVORD, not the table editor, to add and delete PVC service parameter information to and from table PVCINFO.

Table PVCINFO contains PVC service parameters, describing the PVC in terms of it master end and slave end. (Typically, the master end is the billing endpoint. It is also usually the X.25 endpoint if only one endpoint is X.25.) The master and slave endpoints are de ned by their DN, channel type (B or D), and logical channel number (LCN) for X.25 endpoints, and by CLLI, CLLI member, and LCN for X.75 endpoints.

Optionally, the PVC's transmission speed, window size, and packet size can be de ned for both receiving and sending of data. These parameters are speci ed, as are the basic service parameters, using the SERVORD command ADDPH.

Permanent Virtual Circuits (continued)

Refer to “SERVORD" for an example of how to data ll table PVCINFO using the SERVORD command ADDPH.

Table PVCINFO also allows the speci cation of the PVC's LA TA status (intra-LATA or inter-LATA), and billing arrangements through table data ll. PVC billing is speci ed in one of four w ays:

- in normal PVC billing, the master endpoint DN is charged (this is the default type of billing, which occurs if no entry is made in table PVCINFO)
- no billing can be speci ed
- a network user identi er (NUI) char ge number can be speci ed for intra-LATA PVCs
- a charge DN can be speci ed for inter-LA TA PVCs (whose master endpoint is X.25 and slave end is X.75)

The following table shows the data ll speci c to Permanent V irtual Circuits for table PVCINFO. Only those elds that apply directly to Permanent Virtual Circuits are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le PVCINFO (Sheet 1 of 4)

Field	Subfield or refinement	Entry	Explanation and action
MSTEND		see subfields	Master end. This field contains subfield ENDTYPE and other fields depending on the value of ENDTYPE.
	ENDTYPE	X25 or X75	Endpoint type. Enter X25 to indicate that the master endpoint is X.25, and datafill subfields DN, CHNL, and LCN. Enter X75 to indicate that the master endpoint is X.75, and datafill subfields CLLI, MEMB, and LCN.
	DN	numeric (up to 18 digits)	Directory number. Enter the DN of the master end of the PVC (from table DNCHNL).
	CHNL	B or D	Channel type. Enter the channel type of the X.25 PVC endpoint.

Permanent Virtual Circuits (continued)

Data lling tab le PVCINFO (Sheet 2 of 4)

Field	Subfield or refinement	Entry	Explanation and action
	LCN	numeric (1 to 4095)	Logical channel number. Enter the LCN used to identify the master end of the PVC.
	CLLI	alphanumeric (1 to 16 characters)	CLLI. Enter the CLLI of the master end PVC trunk group (from table X75INFO).
	MEMB	numeric (0 to 9999)	PVC index number. Enter the index number used to identify the master end PVC on the X.75 trunk.
SLVEND		see subfields	Slave end. This field contains subfield ENDTYPE, and other fields depending on the value of ENDTYPE.
	ENDTYPE	X25 or X75	Endpoint type. Enter X25 to indicate that the slave endpoint is X.25, and datafill subfields DN, CHNL, and LCN. Enter X75 to indicate that the slave endpoint is X.75, and datafill subfields CLLI, MEMB, and LCN.
	DN	numeric (up to 18 digits)	Directory number. Enter the DN of the slave end of the PVC (from table DNCHNL).
	CHNL	B or D	Channel type. Enter the channel type of the X.25 PVC endpoint.
	LCN	numeric (1 to 4095)	Logical channel number. Enter the LCN used to identify the slave end of the PVC.
	CLLI	alphanumeric (1 to 16 characters)	CLLI. Enter the CLLI of the slave end PVC trunk group (from table X75INFO).
	MEMB	numeric (0 to 9999)	Permanent virtual circuit index number. Enter the index number used to identify the slave end PVC on the X.75 trunk.
PVCOPTNS		see subfield	Permanent virtual circuit options. This field consists of subfield PVCPRM.

Permanent Virtual Circuits (continued)

Data lling tab le PVCINFO (Sheet 3 of 4)

Field	Subfield or refinement	Entry	Explanation and action
	PVCPRM	BILLING, LATA, RECVPS, RECVTC, RECVWS, SENDPS, SENDTC, SENDWS	PVC parameters. Enter the PVC parameter. Up to eight parameters can be entered. When finished entering the parameters, end the list with a $. Enter BILLING for billing and datafill refinement ENABLE. Enter LATA to define the LATA status and datafill refinement LRANGE. Enter RECVPS for receiving packet size and datafill refinement PSIZE. Enter RECVTC for receiving throughput class and datafill refinement TPUTCLAS. Enter RECVWS for receiving window size and datafill refinement WSIZE. Enter SENDPS for sending packet size and datafill refinement PSIZE. Enter SENDTC for send throughput class and datafill refinement TPUCLAS. Enter SENDWS and datafill refinement WSIZE.
	LRANGE	INTER or INTRA	If the entry in subfield PVCPRM is LATA, datafill this refinement. Enter the LATA status for the PVC. The default value is INTRA.
	PSIZE	128 or 256	If the entry in subfield PVCPRM is RECVPS or SENDPS, datafill this refinement. Enter the packet size for master end packet data receiving or sending. The default value is 128.

Permanent Virtual Circuits (continued)

Data lling tab le PVCINFO (Sheet 4 of 4)

Field	Subfield or refinement	Entry	Explanation and action
	TPUTCLAS	75, 150, 300, 600, 1200, 2400, 4800, 9600 or 19200, 48000, 56000, 64000	If the entry in subfield PVCPRM is RECVTC or SENDTC, datafill this refinement. Enter the receiving or sending throughput class baudrate value for the master end. If one of the endpoints is identified as X25 D, the valid entries are 75, 150, 300, 600, 1200, 2400, 4800 and 9600. If both endpoints are X25 B or X75, additional valid entries are 19200, 48000, 56000 and 64000. The default value is 9600.
	WSIZE	1 to 127	If the entry in subfield PVCPRM is RECVWS or SENDWS, datafill this refinement. Enter the window size for master end packet data receiving or sending. If one of the endpoints uses MODULO 8 packet level sequencing (PLSQ), as defined in table X75INFO, valid entries are 1 to 7. If both endpoints use MODULO 128 PLSQ, valid entries are 1 to 127. The default value is 2.

PVCPRM=BILLING

If the entry in eld PVCPRM is BILLING, data ll re nement EN ABLE as described below.

Field descriptions for conditional data ll (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	ENABLE	Y or N	Billing enable. Enter Y to produce a billing record for each PVC call and datafill refinement BILLSEL. Otherwise, enter N. The default value is Y (yes).
	BILLSEL	NUI, CHRGDN, NORMAL	Billing selection. Enter NUI to specify that PVC calls are to be charged to the NUI, and datafill subfield DIGITS. Enter CHRGDN to specify a chargeable DN for Type 2 billing of inter-LATA PVC calls, and datafill subfields ADDRFMT, CHRGDN, CHNLTYP, and LCN. The default value is NORMAL. ***Note:*** NUI is valid only for intra-LATA calls, and CHRGDN is valid only for inter-LATA calls. NORMAL is valid for Type 1 billing for inter- and intra-LATA calls.
	DIGITS	numeric (up to 15 digits)	Network user identifier digits. If the entry in subfield BILLSEL is NUI, datafill this refinement. Enter the NUI number to be inserted into the billing record.
	ADDRFMT	E164 or X121	Address format. If the entry in subfield BILLSEL is CHRGDN, datafill this refinement. Enter E164 to specify the E.164 address format. Or enter X121 to specify the X.121 address format.
	CHRGDN	numeric (up to 14 digits)	Chargeable directory number. Enter the chargeable DN. If the entry in field ADDRFMT is E164, the DN is up to 14 digits. If the entry in field ADDRFMT is X121, the DN is 5 to 14 digits.

Permanent Virtual Circuits (continued)

Field descriptions for conditional data ll (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	CHNLTYP	D, B1, B2	Channel type. Enter the channel type of the chargeable DN.
	LCN	1 to 4095	Logical channel number. Enter the PVC logical channel number used to identify the master X.25 endpoint of the PVC call.

Data ll e xample for table PVCINFO

The following example shows sample data ll for the Permanent V irtual Circuits Capability in table PVCINFO. The rst example shows an intranodal PVC whose master and slave endpoints are both X.25; the throughput class for sending and receiving is de ned as 2400 bit/s. In the second e xample, an inter-LATA PVC is de ned with an X.25 master end, an X.75 slave end, and a charge DN, 16137335113, with an E.164 address format, channel type of D, and LCN of 4.

MAP display example for table PVCINFO

```
MSTEND              SLVEND                          PVCOPTIONS
_____________________________________________________________

X25 7332401 D 3     X25 7334022 D 2   (SENDTC 2400)
                                      (RECVTC 2400) $
X25 7335887 B 1     X75 IECX7522 2 3  (LATA INTER)
                                      (BILLING Y CHRGDN E164
                                      16137335113 D 4) $
```

Translation veri cation tools

Permanent Virtual Circuits does not use translation veri cation tools.

SERVORD

SERVORD is used to

- de ne logical channel assignments using SETPH
- de ne PVC service parameters using ADDPH

Table DNCHNL contains logical channel assignment for the DN. When a PVC is being assigned to a DN, it is necessary to ensure that there is a logical channel available for the PVC.

Permanent Virtual Circuits (continued)

Logical channels can be provisioned as permanent virtual circuits (PVCs) or switched virtual circuits (SVC). SVCs can be provisioned as incoming only (IVC), outgoing only (OVC), or unrestricted (incoming and outgoing).

The number of logical channels that are carried on a particular B- or D-channel is established when a service for the particular channel is ordered. A stack of numbers is reserved for the channel, one number for each logical channel that is to be provisioned.

CCITT rules require that the logical channel numbers be assigned so that PVCs receive the lowest block of numbers, IVCs receive the second block, unrestricted channels receive the next block, and OVCs use the highest numbers, as shown in gure “Logical channel assignment."

When the logical channels are being provisioned, the numbers for unrestricted channels are automatically assigned, based on the numbers assigned to the other types of channels, according to the following equation:

```
number of unrestricted channels =
    NUMLCN – (NUMPVC + NUMIVC + NUMOVC)
```

where

NUMLCN is the total number of LCNs reserved for the B- or D-channel

NUMPVC is the number of PVCs

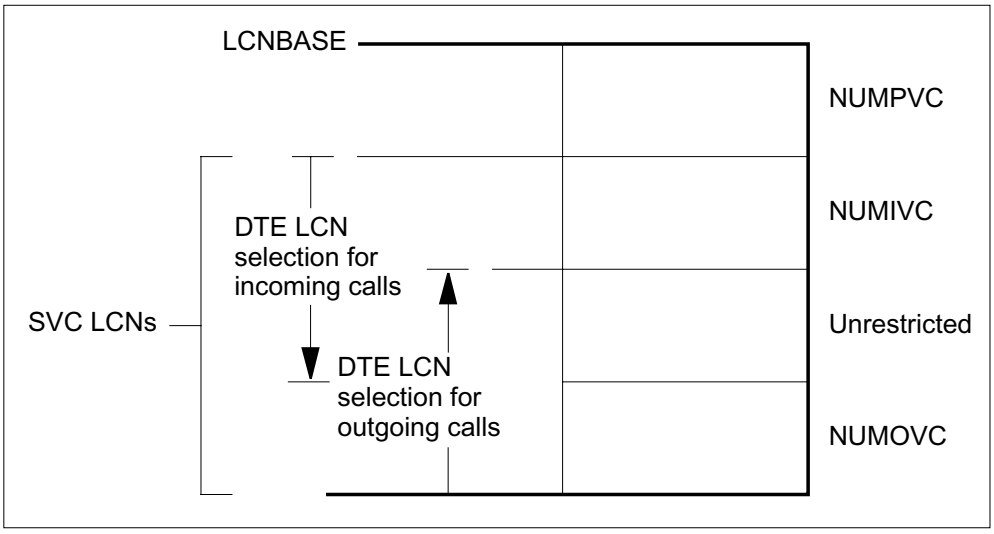
NUMIVC is the number of IVCs

NUMOVC is the number of OVCs

The DMS-100 switch derives the number of unrestricted channels from the values of the SERVORD parameters NUMLCN, NUMIVC, NUMOVC, and NUMPVC, and places it in the NNRC eld of table DNCHNL.

Permanent Virtual Circuits (continued)

Logical channel assignment



At load-build time, the default con guration is as follo ws:

NUMPVC= 0

NUMIVC= 0

NUMOVC= 0

NUMLCN= 0

LCNBASE= 0

The SERVORD command SETPH is used to specify logical channel assignment for the DN. SERVORD automatically updates table DNCHNL according to the following SERVORD parameters:

- LCNBASE updates SLCN
- NUMLCN is used in the equation shown above to determine the number of unrestricted channels, which then updates eld NNRC
- NUMPVC updates eld NPVC
- NUMOVC updates eld NO WO
- NUMIVC updates eld NO WI

Refer to “SERVORD example" for an example of how to data ll table DNCHNL using the SERVORD command SETPH.

SERVORD limitations and restrictions

Not applicable

SERVORD prompts

The following table shows the SERVORD prompts used to change logical channel and PVC channel assignment.

SERVORD prompts for changing LAPB/LAPD parameters

Prompt	Valid input	Explanation
LAPB_PARM	a LAPB parameter (refer to the list in the “PVC parameters" table)	LAPB parameter. Enter the LAPB parameter to be changed.
LAPD_PARM	a LAPD parameter (refer to the list in the “PVC parameters table)	LAPD parameter. Enter the LAPD parameter to be changed.
LTID	a logical terminal group name (1 to 8 alphanumeric characters) followed by a space and a terminal number (1 to 1022)	Logical terminal ID. Enter the LTID that will identify the logical terminal whose parameters are being changed.

The following table shows the service order prompts used to provision a PVC using the ADDPH command.

SERVORD prompts for Permanent Virtual Circuits (Sheet 1 of 2)

Prompt	Valid input	Explanation
ADD_OPTION	DNA, PVC, or CUG	Add option. Enter PVC to provision a PVC.
LTID	a logical terminal group name (1 to 8 alphanumeric characters) followed by a space and a terminal number (1 to 1022)	Logical terminal identifier. Enter the LTID that will identify the logical terminal associated with the PVC.

Permanent Virtual Circuits (continued)

SERVORD prompts for Permanent Virtual Circuits (Sheet 2 of 2)

Prompt	Valid input	Explanation
ORIGDNA	For X.25: a DN (up to 18 digits) For X.75: a CLLI (alphanumeric 1 to 16 characters) and member (0 to 9999)	Originating DNA. Enter the DN (for X.25) or CLLI and member (for X.75) that specifies the originating, or master, endpoint of the PVC (the endpoint that is billed by default).
ORIGLCN	1 to 1024	Originating LCN. Enter the LCN of the originating, or master, endpoint.
RESPDNA	For X.25: a DN (up to 18 digits) For X.75: a CLLI (alphanumeric 1 to 16 characters) and member (0 to 9999)	Slave DNA. Enter the DN (for X.25) or CLLI and member (for X.75) that specifies the slave endpoint of the PVC.
RESPLCN	1 to 1024	Slave LCN. Enter the LCN of the slave endpoint.
PVC_PARM	a PVC parameter (refer to the list in the “PVC parameters")	PVC parameter. Enter the PVC parameter to be defined.

SERVORD example for adding Permanent Virtual Circuits

The following SERVORD example shows how a default LAPB parameter is changed using the SETPH command. (The same command process is used to change default LAPD parameters.)

Permanent Virtual Circuits (continued)

SERVORD example for setting up the LAPB/LAPD parameters using SETPH in prompt mode

```
>SETPH
SONUMBER:  NOW 98 03 03 PM
> (CR)
LTID:
> ISDN 44
LAPB_PARM:
> LCNBASE
LCNBASE:
> 4
LAPB_PARM:
> NUMLCN
NUMLCN:
> 2
LAPB_PARM:
>NUMPVC
NUMPVC:
> 1
LAPB_PARM:
> $
```

SERVORD example for setting up the LAPB/LAPD parameters using SETPH in no-prompt mode

```
>SETPH $ ISDN 44 LCNBASE 4 NUMLCN 2 NUMPVC 1 $
```

The following service order example shows how the PVC is de ned.

Permanent Virtual Circuits (end)

SERVORD example for setting up Permanent Virtual Circuits using ADDPH in prompt mode

```
SO:
> ADDPH
SONUMBER: NOW 95  6  7 PM
> (CR)
LTID:
> ISDN 52
ADD_OPTION:
>PVC
ORIGDNA:
> 6132563345
ORIGLCN:
> 1
RESPDNA:
> 6132567789
RESPLCN:
> 1
PVC_PARM:
> MSENDTPT
MSENDTPT:
> 9
PVC_PARM:
> MRECVTPT
MRECVTPT:
>9
PVC_PARM:
> $
ADD_OPTION:
> $
```

SERVORD example for setting up Permanent Virtual Circuits using ADDPH in no-prompt mode

```
>ADDPH $ ISDN 52 PVC 6132563345 1 6132567789 1 MSENDTPT
9 MRECVTPT 9 $
```

2 Introduction to NI0 NI-2/3 BRI

Understanding translations

This chapter provides information on data lling and requirements for provisioning NI0 NI-2/3 BRI.

Functional groups for NI0 NI-2/3 BRI

The functional group ordering codes for NI0 NI-2/3 BRI are NI000051 and NI000052. NI000051 and NI000052 are under software optionality control (SOC). NI000051 and NI000052 SOC options are dependent on the following SOC options:

- NI2 BRI Functional Group NI000050
- NI0 ISDN Base, NI000007
- NI0 NI-1 BRI, NI000008
- NI0 NI-1 Packet, NI000010

The following table cross references the NI0 NI-2/3 functional groups with the translations chapters contained in this section.

Table 2-1 Chapters corresponding to functional groups

Functional group ordering code	Functional group name	Applicable chapters
NI000051	NI0 NI-2/3	Packet
		NI2
		Call Forwarding
		Electronic Key Telephone Service
		Flexible Calling
NI000052	NI0 NI-2/3	On-demand B-channel Packet Mode Data Provisioning

Signaling for NI0 NI-2/3 BRI

NI0 NI-2/3 BRI supports switch functional (NI-1) signaling method.

Functional signaling

Functional signaling is based on an exchange of information between an intelligent terminal and the network. This signaling method allows users to access new network features and services. Functional signaling makes ISDN standardization easier.

BRI channels

BRI provides two 64 kbit/s bidirectional data channels, known as B-channels, and one 16 kbit/s signaling channel, known as the D-channel. This signaling method is referred to as 2B+D signaling. An additional 16-kbit/s channel is provided for maintenance purposes.

BRI provides access to

- circuit-switched voice and data services on the 64 kbit/s B-channels
- high-speed packet data services on a provisioned B-channel connection
- low-speed packet data services on the 16 kbit/s D-channel

A BRI line has a transmission speed of 192 kbit/s. If a network termination 1 (NT1) is present, the transmission speed is 160 kbit/s on the portion of the line between the NT1 and the enhanced line concentrating module with ISDN (LCME). BRI provides the following channels for call placement, call control, and maintenance:

- two bidirectional 64 kbit/s (data) B-channels
- one bidirectional 16 kbit/s (signaling) D-channel
- one bidirectional 8 kbit/s M-channel
- one one-way 800-bit/s Q-channel
- ve one-way 800-bit/s S-channels

The remaining bits are used for sequencing and framing information.

B-channels

Each of the two B-channels is used for either circuit-switched voice and data or for provisioned high-speed access to a packet handler.

Circuit-switched connections on the B-channel are temporary; that is, they are established and subsequently disconnected for each call.

B-channel packet service is offered on dedicated connections. These connections must be provisioned at subscription time. A B-channel used for

packet data can be reassigned to circuit-switched service only by changing the data ll in the ISDN node. Similarly , a B-channel used for circuit-switched service can be reassigned to B-channel packet service only by changing the data ll.

In NA014, feature On-demand B-channel (ODB) X.25 Packet Mode Data (PMD)— Provisioning, Data Distribution Manager, and XLIU (59013267) allows a subscriber to initiate on-demand B-channel connections between the subscriber's line and a packet handler (PH). This on-demand B-channel connection between the subscriber line and the PH uses Q.931 procedures. Once connected, the subscriber can originate and receive packet-mode data calls over the B-channel. When not being used for packet-mode data, the B-channel is available for voice and circuit-switched data calls. This arrangement allows the sharing of a B-channel by voice information (VI), circuit mode data (CMD), and PMD calls.

D-channel

BRI uses a single D-channel to carry

- call control messages associated with B-channel circuit-switched voice and data
- low-speed packet data and associated signaling

D-channel connections are provisioned at subscription time.

M-channel

The M-channel is an 8 kbit/s maintenance channel that carries messages between the LCME processor, line cards, and the NT1.

Q/S-channel

The Q-channel is an 800-bit/s maintenance channel that runs from the ISDN terminals to the NT1.

The S-channel is composed of ve 800-bit/s channels. The rst of the S-channels, S1, is the counterpart to the Q-channel, and runs from the NT1 to the ISDN terminals. The remaining S-channels are not currently used.

The Q- and S-channels are commonly discussed together as the Q/S-channel.

Preparing to data ll NI0 NI-2/3 BRI

It is necessary to ensure the appropriate ISDN hardware and software is installed, before beginning to data ll the tables.

The data ll requirements in volve three main areas of functionality:

- data lling of ce con guration tables to con gure the ISDN hardw are, provide the logical connections, and specify default service parameters
- data lling system tables for digit translation and call routing, and customer groups tables
- data lling line service access tables to provide ISDN services to individual subscribers

What this section contains

The following paragraphs provide a summary of the information contained in each chapter.

Electronic Key Telephone Service (EKTS) and Virtual Key Application. This chapter provides call handling e xibility for multiple appearance directory number (MADN) using Call Appearance Call Handling (CACH) so that calls can originate from and terminate to any combination of call appearances; and end-user provisioning of the call offering sequence.

Call Forward Enhancements. Supports a variety of call forwarding types (Universal, Busy, Don't Answer) for incoming calls to an ISDN set.

Additional enhancements include the following:

- Call Forward Keylist per Directory Number/Call Type (DN/CT)—Universal
- Feature Key Activation/Deactivation per DN/CT—Universal
- Call Forward Activation/Deactivation Outside Call Context—Universal
- Single or Double Feature Key Invocation per DN/CT—Universal
- Call Forward Reminder Noti cation
- Call Forward Courtesy Call
- Remote DN Validation during Programming
- Call Forward Dial Activation/Deactivation per DN/CT
- Prevention of Redirection Information to Originating Party

Music On Hold. Provides an announcement or music to the held party of an ISDN BRI call. The subscription of music on hold is a prerequisite for the ISDN BRI call.

Calling Name/Number Delivery and Suppression. Offers name, number delivery, and suppression to the called party from the ISDN set. The CCS7 network protocol supports this feature. Per call blocking and unblocking of calling name/number delivery from the ISDN set is also supported.

Flexible Calling Enhancements. Allows an ISDN user to establish and control two or more concurrent calls using one B-channel, as well as select the size (simultaneous 3- and 6-way calling) of a given ISDN conference call.

Flexible Calling includes the following additional enhancements:

- NI-2 transfer allowing explicit provisioning of implicit and explicit transfer
- e x call transfer to a UCD queue
- attendant console interworking
- simultaneous provisioning of multiple e x calls with different conference sizes (6, 30, 3 and 6)

Service Protection—Essential Line. Provides preferential dial tone to selected ISDN BRI lines when severe overload conditions occur. When this preference is given to essential ISDN BRI lines, non-essential lines can experience service delays.

ISDN Interworking with Standard Announcements. Allows NI-1 and NI-2 terminals that send digits in band to work with features that typically expect out-of-band digits.

The following interface con gurations are supported for NI0 NI-2/3 BRI:

- eight non-initializing terminals (NIT)
- seven NITs and one fully initializing terminal (FIT)
- two FITs

Shared DN with Different Call Types. Allows a DN to be shared between a circuit NIT/FIT terminal and a packet mode terminal. The shared DN on the packet terminal can be used for D-channel packet service (with static TEI) or semi-permanent B-channel packet service.

Parameter Downloading. Enables the customer's ISDN terminal to read certain parameters into its memory, synchronizing terminal and switch databases. The downloading capability can only be invoked from an initializing terminal. The terminal requests a download from the switch, and the switch responds by sending the parameter values. The terminal ends the downloading process by transmitting an acknowledgment to the switch. This minimizes the number of parameters a customer is required to manually enter into an ISDN terminal.

Automatic Message Accounting (AMA) Billing. Supports AMA records for the following ISDN features:

- ISDN NI-2 ACB/AR functionality
- ISDN NI-2 Flexible Calling functionality
- ISDN NI-2 Calling Name Delivery capabilities

Provisioning Enhancements. Provides the following enhancements to ISDN service provisioning:

- simpli es particular add, change, and delete service order procedures for NI-2/3 BRI services
- adjusts the parameter naming discrepancy between service order, table control, query commands, and the NI-1 data dictionary

Intra-LATA Primary Interexchange Carrier (LPIC). This feature permits the assignment of LPIC against a DN/CT. The capability to override the presubscribed LPIC carrier is provisionable.

Automatic Callback/Automatic Recall (ACB/AR). ACB allows the last DN an ISDN BRI subscriber called to be automatically redialed. AR allows the DN of the last incoming call to an ISDN BRI subscriber to be automatically dialed.

ISDN Support for Associated Groups for each Logical Terminal Identi er (LTID). An associated group (AG) provides the capability to restrict DN/CT, or a group of DN/CTs to use a single B-channel at a time. This feature provides the ability to restrict 2B or NI-2 LTID access to a single B-channel through an AG. The AF6442 feature also provides the ability to place all the voice DNs or circuit mode data (CMD) DNs of NI-2 or a 2B LTID in an AG.

Flowthrough Provisioning. The o wthrough provisioning feature adds the functionality of screening NA008 and pre-NA008 BRI ISDN call processing features. The screening blocks assigning unsupported terminal and call processing con gurations through SER VORD.

On-demand B-channel X.25 Packet Mode Data provisioning. On-demand B-channel X.25 packet mode provisioning allows the user to make on-demand X.25 B-channel packet calls. The subscriber is able to initiate on-demand connections between their line and a packet handler. This is made possible by provisioning the subscriber DN with the ODB option. On-demand B-channel Packet Mode Provisioning allows the sharing of B-channels by VI, CMD, and PMD calls. The B-channels are available for voice or CMD calls when not being used for PMD calls.

3 Data lling NI0 NI-2/3 BRI

The following chapter describes the NI0 NI-2/3 BRI, NI000051, functionality.

Busy Determination Parameter Enhancement

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

Busy Determination Parameter Enhancement has no prerequisites.

Description

Busy Determination Parameter Enhancement increases the number of calls that may be concurrent for ISDN sets from 5 for each directory number (DN) to 16 for each directory number call type (DNCT). As part of the enhancement, the option ACOU (additional call offering unrestricted) and its noti cation busy limit (NBL) parameters are assigned on a DNCT basis. The possible NBL range for NI2 sets is increased from four to one less than the value assigned to the option (CRBL) call reference busy limit for the same call type (CT), except when the CRBL value is set to 1.

The maximum number of calls that a user can originate and hold is equal to the CRBL value of calls for each DNCT. If option ACOU has been assigned, the total number of active originating and terminating calls is the sum of the CRBL values assigned to the DNCTs.

Operation

The following user interface changes are created by the Busy Determination Parameter Enhancement feature:

- The DK (post directory number key) maintenance command can hold up to 10 DN appearances in its buffer. Any DN with more than 10 DN appearances is prompted to display the information using the parameter “KEY" instead of “ALL."
- The NBCQUERY command is modi ed to output the noti cation b usy count (NBC) on the basis of CT for NI-2 sets.
- The QDN (query directory number) command response display is modi ed to include ne w ACOU, CRBL, default bearer capability (DBC) and NBL information.
- The QLT (query logical terminal) command response display is modi ed to include new ACOU, CRBL, DBC and NBL information.

Busy Determination Parameter Enhancement (continued)

NBCQUERY COMMAND

NBCQUERY command output is changed to display the NBC for both voiceband information (VI) and circuit mode data (CMD) call types for NI-2 sets. The following gure sho ws the MAP display when a NBCQUERY command is entered.

Example MAP display of the results of a NBCQUERY command entry

```
> NBCQUERY 7455164
Notification Busy Status
NBL (VI)  = 1   NBC (VI)  = 0
NBL (CMD) = 1   NBC (CMD) = 0
```

QDN command

QDN output is changed to show that option CRBL had been assigned to the DN, and that NBL and additional ACOU are assigned on a call type basis. The following gure sho ws the MAP display when a QDN command is entered.

Example MAP display of the results of a QDN command entry

```
> QDN  7455164
------------------------------------------------------
DN: 7455164
TYPE:  SINGLE PARTY LINE
SNPA:  613   SIG  N/A    LNATTIDX:  N/A
LTID:  ISDN 1
LTCLASS:  ISDN 1
LINE CLASS CODE:   ISDNKSET
KEY:  1
CUSTGRP:              COMKODAK SUBGRP:  0  RING:  Y
OPTIONS:
SFC
CRBL 2 2
ACOU 1 1 FC 6 CPU 0 ISDN 7 $
```

QLT command

QLT output is changed to show that CRBL is assigned as an option to a DN key. The resulting display also shows the DBC value assigned to each DN-related key. The following gure shows the MAP display when the QLT command is entered.

Busy Determination Parameter Enhancement (continued)

Example MAP display of the results of a QLT command entry

```
> QLT ISDN 1
LTID:  ISDN 1
SNPA:  909
DIRECTORY NUMBER:  7455164
LT GROUP NO:  10
LTCLASS:  BRAFS   DEFAULT LOGICAL TERMINAL:  N
EKTS:  N CACH:  N
BEARER SERVICE RESTRICTIONS:   NOPMD
CS:  NI2 PS:  N
VERSION:  FUNCTIONAL ISSUE:  2
SPID-SUFFIX:        1
LEN:  SLCM 02 0 00 18  TEI:  DYNAMIC
CUSTGRP:             BNR SUBGRP:  0  NCOS:  0   RING:  Y
LINE CLASS CODE:  ISDNKSET
MAXKEYS:  64
OPTIONS:
MSB $ SFC
HLD FC 6 CPU 0 RCC2 81 $ CFU N $ I 1

KEY         DN
---         --
1           DN 6137455164 NCPA 4

KEY        FEATURE
---        -------
1           CRBL 2 2
1           ACOU 1 1
1           DBC DBC_SP
2           AFC DBC_3_1_K
3           AFC DBC_56K
4           AFC DBC_64K
14          CPU     0 RCC2      81  $
16          CFU  N                          $ I 1
17          FC             3
21          FC             6
22          MSB $
24          RLS
25          HLD
```

Busy Determination Parameter Enhancement (continued)

Limitations and restrictions

The following limitations and restrictions apply to Busy Determination Parameter Enhancement:

- The simultaneous alerting of calls presented to the user is limited to the NBL for each DNCT.
- Option CRBL is assignable only to NI-2 sets.
- Logs that include a key number as part of their output (for example LINE138 and AMAB17) are generated. The log report identi es a k ey number that might be different from the actual key used by the set. This occurs because the DMS switching system is unable to control which key number is used by the set. The ISDN set uses its own intelligence to determine which key to present the call. However, the output report for the key does associate the key with correct DN.

Interactions

The following paragraphs describe the interactions between Busy Determination Parameter Enhancement and other functionalities.

The CRBL and the DBC data is downloaded to the customer premises equipment (CPE) using the functionality created by feature AF6632, ISDN Parameter Downloading.

In NA008, the ISDN idle noti cation trigger condition is enhanced. The enhancement is based on the noti cation busy condition for each separate call type. The enhanced trigger occurs when the noti cation b usy condition is cleared, and the feature involved is noti ed. This enhancement applies to the following features:

- Automatic Call Back (ACB)
- Automatic Recall (AR)
- Call Forwarding (CFX)
- Call Park (PRK)
- Key Short Hunt (KSH)
- Ring Again (RAG)

Activation/deactivation by the end user

Busy Determination Parameter Enhancement requires no activation or deactivation by the end user.

Busy Determination Parameter Enhancement (continued)

Billing

Busy Determination Parameter Enhancement does not affect billing.

Station Message Detail Recording

Busy Determination Parameter Enhancement does not affect Station Message Detail Recording.

Data lling of ce parameter s

Busy Determination Parameter Enhancement does not affect of ce parameters.

Data ll sequence

The following table lists the table that requires data ll to implement Busy Determination Parameter Enhancement.

Data ll tab les required for Busy Determination Parameter Enhancement

Table	Purpose of table
KSETFEAT	Business Set and Data Unit Feature. This table lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE. This table also lists the line features that are assigned to the Meridian digital telephone sets and DUs listed in table IVDINV.

Table KSETFEAT is data lled as a result of SER VORD activity. Entries for features ACOU, AFC, CRBL, DBC are made in this table automatically when these features are assigned to a ISDN set using SERVORD. Examples of these entries can be seen in gure MAP display for table KSETFEA T that follows.

Data lling tab le KSETFEAT

The following table shows the data ll speci c to Busy Determination Parameter Enhancement for table KSETFEAT. Only those elds that apply directly to Busy Determination Parameter Enhancement are shown. For a

description of the other elds, refer to the data schema section of this document.

Data lling tab le KSETFEAT (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
FEATKEY		see subfields	*KSET feature key* This field consists of subfields LEN, KEY, and FEAT.
LEN		see subfields	*Line equipment number* This field defines the physical location of the equipment that is connected to a specific telephone line. Because field LEN is common to more than 60 tables, it is documented in a single section to avoid unnecessary duplication. Refer to section “Common entry field LEN" for a complete description of field LEN and associated subfields. For ISDN lines, field LEN consists of subfield LTID. For non-ISDN lines, field LEN consists of subfields SITE, FRAME, UNIT, DRAWER or LSG, SHELF, SLOT, and CIRCUIT.
	KEY	1 to 69	*Physical key* Enter the number associated with the *Physical key* to which the feature is being assigned.
	FEAT	ACOU, AFC,CRBL, DBC	*Feature* Enter the name of the feature being added.
FEATURE		ACOU, AFC,CRBL, DBC	*Feature* Enter the name of the feature being added.
KVAR		see subfield	*Key variable area* If the option being added is ACOU, this field consists of subfields NBL for Voiceband Information and NBL for Circuit Mode Data.

Busy Determination Parameter Enhancement (continued)

Data lling tab le KSETFEAT (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	NBL for VI	0 to 15	*Notification busy limit for Voiceband Information* Enter a value representing the maximum number of additional calls against a VI call that the user is informed about concurrently.
	NBL for CMD	0 to 15	*Notification busy limit for Circuit Mode Data* Enter a value representing the maximum number of additional calls against a CMD call that the user is informed about concurrently. If the option being added is AFC, this field consists of subfields MASTER_KEY and Default Bearer Capability.
	MASTER_KEY	1 to 69	*Master key* Enter the single functional call (SFC) directory number (DN) key on the logical terminal to which feature AFC is assigned. Currently only key 1 is allowed since the SFC DN must be the primary DN (PDN) key, that is, key 1. Also, the master key number must be smaller than all its AFC keys.
	Default Bearer Capability	DBC_SP, DBC_3_1K, DBC_56K, DBC_64K	*Default bearer capability* Enter the allowable DBC for the key position on the terminal. If the option being added is CRBL, this field consists of subfields Voiceband Information and Circuit Mode Data. ***Note:*** The default CRBL is 1 for each call type.
	Voiceband Information	0 to 16	*Voiceband Information* Enter the maximum number of active calls that a NI-2 DN can have at any one time for a VI call type.
	Circuit Mode Data	0 to 16	*Circuit Mode Data* Enter the maximum number of calls that a NI-2 DN can have at any one time for a CMD call type.

Busy Determination Parameter Enhancement (continued)

Data lling tab le KSETFEAT (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
			If the option being added is DBC, this field consists of bearer capability.
	Bearer Capability	DBC_SP, DBC_3_1K, DBC_56K, or DBC_64K	*Bearer Capability* Enter the allowable default bearer DBC for the key position on the terminal.

Data ll e xample for table KSETFEAT

The following example shows sample data ll for table KSETFEA T.

Example MAP display for table KSETFEAT

```
FEATKEY    FEATURE    KVAR
-------    -------    ----
ISDN 7 1   ACOU ACOU  1 1
ISDN 7 1   CRBL CRBL  2 2
ISDN 7 1   DBC DBC    DBC_SP
ISDN 7 2   AFC AFC    1 DBC_3_1K
ISDN 7 3   AFC AFC    1 DBC_56K
ISDN 7 4   AFC AFC    1 DBC_64K
```

Translation veri cation tools

Busy Determination Parameter Enhancement does not use translation veri cation tools.

SERVORD

SERVORD is used by Busy Determination Parameter Enhancement to add or modify the following features to either an NI-1 set or an NI-2 set.

- Option CRBL limits the number of active calls on an NI-2 set on a call type basis. It is added to NI-2 sets using the NEW command and is updated with the CHF (change feature) command.
- Option DBC allows the user to assign a default bearer capability to each DN appearance key on an NI-2 FIT set. It is automatically assigned to a

Busy Determination Parameter Enhancement (continued)

DN or AFC key during service order activity. The CHF command is used to change the DBC value for a DN or AFC key.

- SERVORD prompts for option ACOU have been modi ed as follo ws:
  - — For NI-1 sets, SERVORD only prompts for a value for the noti cation busy limit (NBL) for voiceband information (VI) call type. The prompt for the NBL value for VI call types is VI_NI1_NBL.
  - — For NI-2 sets, SERVORD prompts for the NBL value for Circuit Mode Data (CMD) calls as well as the VI_NI1_NBL value. The prompt for the NBL value for CMD call types is CMD_NBL. The CMD_NBL prompt only applies to NI-2 sets.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to Busy Determination Parameter Enhancement:

- Option CRBL is assignable to NI-2 sets only using the NEW command.
- The CHF command updates CRBL values on NI-2 sets.
- Option DBC is permitted for NI-2 FIT sets only.

SERVORD prompts

The following table shows the SERVORD prompts used to add or modify Busy Determination Parameter Enhancement on NI-1 and NI-2 sets.

SERVORD prompts for Busy Determination Parameter Enhancement (Sheet 1 of 3)

Prompt	Valid input	Explanation
CMD	0 to 16	Indicates number of active calls that may be assigned for the CMD call type for the DN.
CMD_NBL	0 to 15	Enter the NBL for the CMD call type. This prompt only applies to NI-2 sets. ***Note:*** The value must be set to 1 less than the call reference busy limit (CRBL) for the call type, except when the CRBL is set to 1.
DBC	DBC_SP DBC_3_1_K DBC_56K DBC_64K	Indicates the allowable default bearer capability for the DN appearance key on the set.
DN	Seven or ten digit number	Enter the DN associated with the service to be established.

Busy Determination Parameter Enhancement (continued)

SERVORD prompts for Busy Determination Parameter Enhancement (Sheet 2 of 3)

Prompt	Valid input	Explanation
DN_OR_LEN_ LTID	Refer to DN and LTID in table 2-5 for information on valid inputs.	Enter the line's DN or LTID. For a MDN line or MLH/DLH members, if a DN is specified, the user is prompted for the LTID. If the LTID is entered, the user is not prompted for the DN.
GROUP	1 to 16 alphanumeric characters	The name of an MDC customer group.
LATANAME	Alphanumeric	The call local access and transport area (LATA) name associated with the originator of the call.
LCC_ACC	ISDNKSET	The line class code for the service to be established.
KEY	1 to 69	The number associated with the physical set key to which the DN is assigned.
LTG	0 to 255 Default is 0	Line treatment group.
NCOS	0 to 255	Network class of service for MDC lines, trunks, or attendant consoles, defines a set of capabilities or restrictions that allows or denies calls.
OPTKEY	1 to 69	Key associated with the option.
OPTION	Refer to table 2-2 for a list of valid inputs.	Option(s) associated with a service to be established, modified, or deleted. A maximum of 20 options can be specified in a single command.
RINGING	Y or N	Specifies whether a ring from a telephone speaker is required in addition to the call waiting tone heard from the handset. Ringing must be set to N for packet terminals.
SNPA	3 digit number	Service numbering plan area (area code)
SONUMBER	Refer to SONUMBER in table 2-5 for information on valid inputs.	The unique number of the service order to be entered.
SUBGRP	0 to 7	Subgroup of a customer group to which a station or DN belongs.

Busy Determination Parameter Enhancement (continued)

SERVORD prompts for Busy Determination Parameter Enhancement (Sheet 3 of 3)

Prompt	Valid input	Explanation
VI	0 to 16	Indicates the number of active calls that may be assigned for the VI call type for the Dn.
VI_NI1_NBL	0 TO 15	For NI-1 sets, enter the NBL value. For NI-2 sets, enter the NBL value for the VI call type. ***Note:*** For NI-2 sets, the value must be set to 1 less than the CRBL for the call type, except when the CRBL is set to 1.

SERVORD example for adding option ACOU to NI-1 set

The following SERVORD example shows how option ACOU is added to an NI-1 set using the ADO command.

Example of option ACOU being added to an NI-1set in prompt mode

```
> ADO
SONUMBER:   NOW 97 04 08 AM
DN_OR_LEN:
> 2345432
OPTKEY:
> 9
OPTION:
> ACOU
VI_NI1_NBL:
> 1
OPTKEY:
> $
```

Example of option ACOU being added to an NI-1 set in no-prompt mode

```
> ADO $ 2345432 9 ACOU 1 $
```

SERVORD example for adding option ACOU to NI-2 set

The following SERVORD example shows how option ACOU is added to an NI-2 set using the ADO command.

Busy Determination Parameter Enhancement (continued)

Example of option ACOU being added to an NI-2 set in prompt mode

```
> ADO
SONUMBER:   NOW 97 04 08 AM
DN_OR_LEN:
> 2345200
OPTKEY:
> 9
OPTION:
> ACOU
VI_NI1_NBL:
> 1
CMD_NBL:
>2
OPTKEY:
> $
```

Example of option ACOU being added to an NI-2 set in no-prompt mode

```
> ADO $ 2345200 9 ACOU 1 2 $
```

SERVORD example for changing option DBC on a NI-2 set

The following example shows how the DBC value assigned to a DN or AFC key can be changed using the CHF command. In the example, the DBC value for key 2 is being changed from DBC_3_1K to DBC_SP.

Example of option DBC being changed using the CHF command in prompt mode

```
> CHF
SONUMBER:  NOW 97 4 10
>
DN:
> 6214040
OPTKEY:
> 2
OPTION:
> DBC
DBC:
> DBC_SP
OPTKEY:
> $
```

Busy Determination Parameter Enhancement (continued)

Example of option DBC being changed using the CHF command in no-prompt mode

```
>CHF 6214040 2 DBC DBC_SP  $
```

SERVORD example for adding option CRBL on a NI-2 set

The following SERVORD example shows how option CRBL is added to an NI-2 set using the NEW command.

Busy Determination Parameter Enhancement (continued)

Example of option CRBL being added to an NI-2 set using NEW command in prompt mode

```
>NEW
SO_NUMBER:  NOW 97 4 10
> $
DN:
> 62114040
LCC_ACC:
> ISDNKSET
GROUP:
> COMKODAK
SUBGRP:
> 0
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
> Y
LATANAME:
> NILLATA
LTG:0
>0
>LEN_OR_LTID:
>ISDN  80
OPTKEY:
>1
OPTION:
>CRBL
VI:
>2
CMD:
>1
OPTKEY:
>$
```

Example of option CRBL being added to an NI-2 set using NEW command in prompt mode

```
>NEW $ 62114040 ISDNKSET COMKODAK 0 0 613 1 Y NILLATA 0 ISDN
80 1 CRBL 2 1 $
```

Busy Determination Parameter Enhancement (end)

SERVORD example for adding additional information to option CRBL

The following example shows additional information added to option CRBL with the CHF (change feature) command.

Example of option CRBL with CHF command

```
>CHF
SO_NUMBER:  NOW 97 4 10
> $
DN_OR_LEN:
> 7235102
OPTKEY:
>1
OPTION:
>CRBL
VI:
>2
CMD:
>5
OPTKEY:
>$
```

Example of option CRBL with CHF command in no-prompt mode

```
>CHF $ 7235102 1 CRBL 2 5 $
```

Note 1: If the CRBL VI value is a number other than 0, all DBC values default to DBC_SP.

Note 2: If the CRBL VI value is 0 and the DBC value in table DNATTRS is BC_64KDATA, all DBC values default to DBC_64K.

Flexible Calling (NI-2)

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

All the data ll information for this particular functionality is included in this document. However, prerequisite software or hardware may be required for complete implementation.

Description

Flexible Calling (FC) for National ISDN 2 (NI-2) terminals enables the FC subscriber to establish two or more concurrent speech calls and join them into a conference of up to 30 members. FC allows the subscriber to:

- designate an established call as a conference call
- hold and retrieve a conference call
- bridge either an incoming or outgoing basic call into a conference call
- release, or drop, the last member to join the conference call
- transfer a conference call

-2) enhances the capabilities of Flexible Calling for NI-2 terminals by allowing the transfer of non-conference related calls.

Operation

Flexible Calling is assigned to the logical terminal in table KSETFEAT, through SERVORD. The following options are used to de ne Fle xible Calling:

- e xible calling (FC) - used to assign FC to either one or two feature keys on the ISDN terminal
- conference size (CONFSIZE) - determines the number of members allowed for conference calls initiated at the terminal

Flexible Calling (NI-2) (continued)

The following additional parameters are also associated with Flexible Calling (NI-2), and are typically assigned with FC:

- DROP - enables the conference controller (that is, the initiator of the conference) to drop the last user from the conference
- TRANSFER - identi es the conference calls and non-conference calls that can be transferred and de nes their transfer conditions

Conference size

When a conference request occurs, one of two types of facilities is seized for the call: either a three-port circuit or a six-port circuit. The three-port facility is selected when a conference size of three is data lled for the terminal. The six-port facility is designated when a conference size larger than three is speci ed. Unless the terminal is used frequently for conferences, users typically nd that a conference size of three is suf cient. Conference size is data lled in table KSETFEA T, through SERVORD.

Three-port conferences can be chained together, in effect providing larger conference sizes. Any non-controlling member in a three-port conference can place a conference on hold and establish a conference to another terminal (ISDN, POTS, MBS, or CLASS set), then retrieve the rst conference and connect all parties. This action can be repeated to build a more extensive FC chain, each link in the conference chain using another three-port circuit, until the maximum number of circuits (de ned with of ce parameter MAX_NO_OF_3_PORTS_IN_CHAIN) is reached. (A second of ce parameter, NO_OF_LARGE_FTR_DATA_BLKS, is used to ensure that suf cient softw are resources are available for conference calls.)

For six-port conference facilities, the operating company can specify the maximum number of six-port circuits that can be in use simultaneously by a speci c customer group. This parameter is speci ed in table CUSTENG.

FC can be provisioned on two feature keys on an ISDN terminal, as long as each instance has a unique maximum conference size assigned to it.

Drop

With the DROP parameter, the user can request the network to clear the last call that was bridged into the conference. (In a conference of only two remaining members, the network interprets this request as a request to release the conference facilities and clear the call.)

The DROP parameter is assigned to a key on the terminal in table KSETFEAT, through SERVORD.

Transfer

-2) supports both conference and call-to-call transfers.

Conference TRANSFER is valid either for implicit or explicit invocation. Non-conference TRANSFER, however, is valid only for explicit invocation. Following are brief descriptions for each type of invocation and comparisons to XFER.

- Implicit Transfer -

  When implicit TRANSFER is provisioned and the controller of a bridged Flex Conference call exits the conference, the call is not taken down. The conferees will remain connected to each other or to the conference circuit. When implicit TRANSFER is not provisioned, all the call legs will be taken down when the controller exits the call. This behavior is consistent with the Flexible Calling XFER feature.

  Implicit TRANSFER can be provisioned against a feature key or a DN key. Provisioning implicit Transfer against a feature key implies the ability to perform explicit TRANSFER using this key.

- Explicit Transfer -

  Explicit transfer requires the subscriber to have the TRANSFER feature assigned to a feature key. The subscriber must explicitly request two calls to be transferred together by invoking the TRANSFER feature key.

  Explicit XFER is a “one-pass" transfer invocation. That is, the subscriber must identify only one (the non-conference) call that is to be transferred. The switch maintains a reference to the conference call and automatically uses it as the “other" party to be transferred together with the call identi ed by the subscriber.

  Explicit TRANSFER does not work as a “one-pass" transfer. Since TRANSFER supports non-conference calls as well as conference calls, the assumption made by XFER that an existing conference call is (automatically) intended as the “other" call does not work. This assumption prohibits non-conference TRANSFERs whenever the subscriber is also participating on an independent conference call. Therefore, to permit non-conference TRANSFERs even while the subscriber has a conference established, the subscriber must issue two TRANSFER feature key requests (“two-pass"), identifying each call to be transferred together.

Conference transfer

With the TRANSFER parameter, the conference controller requests the network to disconnect the originating terminal (that is, the controller) from the conference and maintain the connection between the remaining conferees.

Flexible Calling (NI-2) (continued)

This type of conference transfer is also referred to as oating a conference because the conference ` oats' or continues without the bene t of a controller.

> ***Note:*** In a three-member conference, the transfer results in release of the conference facilities and the call continues as a regular two-way connection.

Assigning a TRANSFER key with an implicit transfer type results in a transfer occurring automatically when the conference controller is disconnected from the call.

The operating company can set up conditions that control whether a transfer request is granted. For conference calls of more than three members, the customer can specify that transfer is always allowed, or that transfer can occur only when one of the remaining conferees is in the same customer group as the controller. For three-member conference calls, the customer can also specify that transfer is allowed when the call is incoming or outgoing, or only when the call is incoming. Alternatively, the operating company can de ne customized transfer conditions for three-member conference calls.

The TRANSFER parameters are assigned to a key on the NI-2 terminal in table KSETFEAT, through SERVORD.

Call-to-call transfer

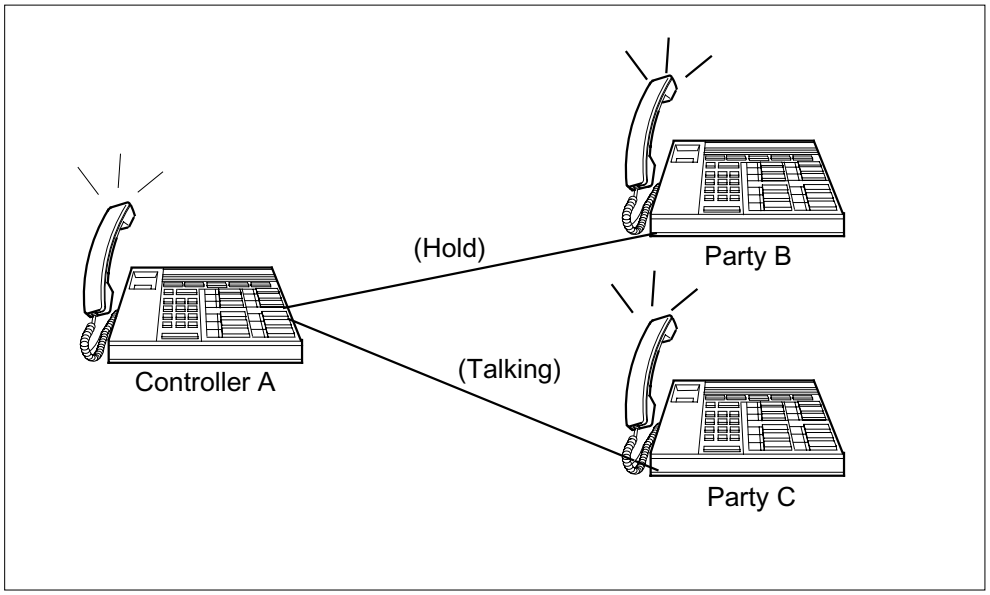
With the TRANSFER parameter, the controller can request the network to transfer one two-party call to another two-party call. Neither party has to be a member of an active conference call. A call-to-call transfer is by explicit invocation.

The following events occur during transfer of one two-party call to another two-party call:

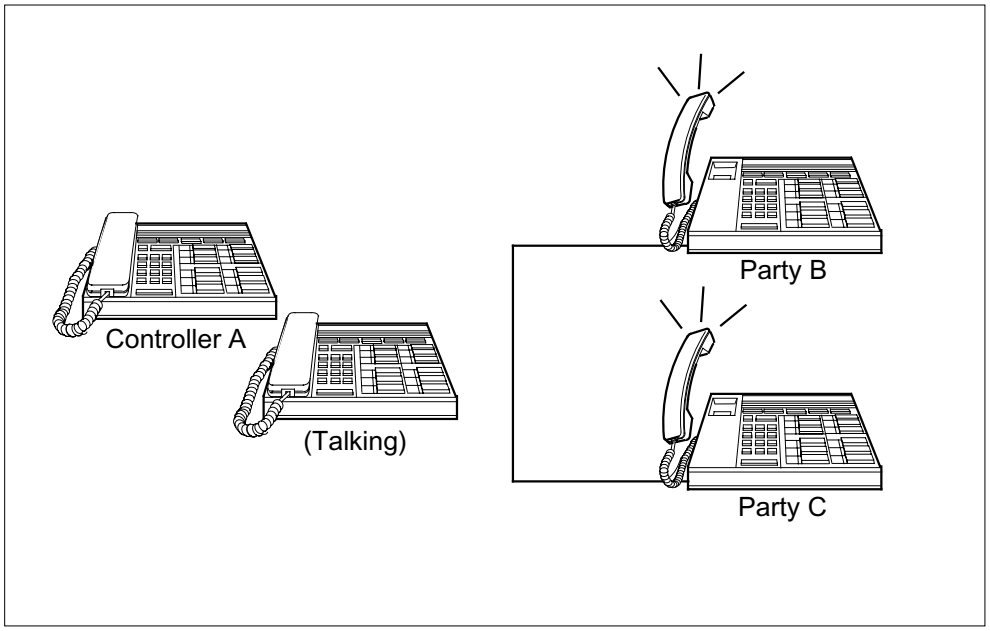
1. Controller A establishes a two-party call with party B
2. Controller A presses the TRANSFER feature key while talking to party B. Party B is tagged for future transfer and placed on hold.
3. Controller A establishes a second two-party call with party C.
4. Controller A presses the TRANSFER feature key and transfers party C to party B. Both parties C and B remain connected to each other.
5. The network releases controller A from both calls and clears the call references.

The following gures illustrate a call-to-call transfer:

Call-to-call TRANSFER after the r st TRANSFER message



Call-to-call TRANSFER after completion



Note: The TRANSFER and XFER parameters are mutually exclusive and dependent on the terminal type used by the subscriber. TRANSFER is assigned to NI-2 terminals; whereas, XFER is assigned to pre-NI-2 terminals.

Flexible Calling (NI-2) (continued)

Translations table o w

The Flexible Calling (NI-2) translations table is described as follows:

- Table KSETFEAT (Keyset Features) lists the features and options associated with the keyset, including the FC, CONFSIZE, TRANSFER, and DROP parameters. This table is data lled through SER VORD.

Limitations and restrictions

The following limitations and restrictions apply to Flexible Calling (NI-2):

- The FC option can be provisioned on two feature keys on an ISDN terminal, as long as each instance has a unique maximum conference size assigned to it.
- -2) is restricted to voice calls. Data calls cannot invoke FC nor can they join an FC conference.
- With explicit transfer, the FC user can transfer a non-conference call to the attendant or into an attendant queue.
- If a business subscriber party wants to transfer a call to the attendant, they can dial code 0 or *0 to get an attendant and then transfer the call to the attendant.
- An MDC line or an ISDN functional terminal cannot pick up an unanswered call that is involved in the FC conference. However, an MDC line or ISDN functional terminal can pick up any other unanswered call on the Basic Rate Interface (BRI).

Interactions

The following paragraphs describe the interactions between Flexible Calling (NI-2) and other functionalities.

Attendant Console

Bridging

FC subscribers can call an attendant console and bridge the attendant into a conference. If the attendant is busy and the call goes to the attendant queue, the attendant queue can be bridged into the conference and the conference receives audible ringing from the attendant queue.

TRANSFER option

If the TRANSFER option is assigned to an FC subscriber, that caller can transfer calls to an attendant. Regardless of the data lled maximum conference size, any FC conference made up of just three parties bridged together (that is, the controller, one conference participant, and the attendant console) can transfer a conference participant to the attendant. Note that if the TRANSFER option is assigned, both explicit transfers (pressing the XFER

key) and implicit transfers (the controller going on-hook) are possible. If the attendant is busy and the call goes to the attendant queue, the conference participants can still be transferred into the attendant queue.

In addition, regardless of the data lled maximum conference size, an y FC conference made up of three non-bridged parties (for example, the controller consulting with the attendant console while the conference participant is on hold) can transfer calls to an attendant. Note that for this call type, only explicit transfer is possible. If the attendant is busy and the call goes to the attendant queue, the conference participants can still be transferred into the attendant queue.

If the TRANSFER option is not assigned and the controller goes on-hook, the add-on leg (that is, the controller to attendant console leg) drops, and the conference participant is left on hold. In this case the controller must go back off-hook to return to the original two-way call.

If the controller drops out of a conference with four or more parties bridged together, the conference is dropped because there is no controller for the conference.

DROP option

If the DROP option is assigned to an FC subscriber, the attendant console or attendant queue can be dropped from the conference if it was the last party bridged into the conference.

Attendant Console Camp-on

When FC is assigned with Attendant Console Camp-on (ACO), the ISDN user (or controller) can place an existing call on hold to connect to a waiting call (referred to as an ACO call). Once the waiting call is answered, the Transfer option is allowed.

Call Appearance Call Handling

The Call Appearance Call Handling (CACH) service is based on the key set service. If a party is located through CACH, that party can be added to a conference and transferred to another party by way of FC or explicit transfer. DN bridging is compatible with FC.

Call Pickup features

Calls established through one of the Call Pickup features are eligible for transfer.

Flexible Calling (NI-2) (continued)

E911

A 911 call routed over an ES line or trunk cannot be bridged to an FC conference unless of ce parameter B911_3WC_ALLO WED in table OFCENG is set to true. Existing Flexible Calling and 911 interactions remain unchanged. For a complete description of FC and E911 interactions, refer to “NI0 Flexible Calling Interworking with E911" in this document.

Executive Busy Override

Executive Busy Override (EBO) is a feature that allows the calling station to barge in on a call. Both parties involved in the call receive a burst of tone indicating that a barge in has occurred. Conferences and calls marked as `Transfer pending' cannot be barged in on.

Hunt

When a party is found through Hunt (either Analog Hunt or Key Set Short Hunt), that party can be transferred to another party.

Line Music on Hold

Party A with FC and Line Music on Hold (LMOH) activates a FC feature to place Party B on hold. The audio source for Party A is AUDIO1. Party B receives audio source AUDIO1. If party A did not have the assignment of LMOH, Party B would receive the audio source for Party A's customer group.

MADN Bridging

FC conferencing can interact with MADN bridging. A MADN group member can MADN bridge into an FC conference. Also, a MADN group member can create an FC conference while MADN bridged. Refer to “MADN/Flexible Calling Interworking for ISDN" in the ISDN section of this document for detailed information.

Malicious Call Hold

Feature Malicious Call Hold (MCH) can be invoked either by key or code access. For code access, the business set must have the 3WC or call transfer feature assigned. FC is not compatible with MCH.

No Double Connect

No Double Connect (NDC) is a line option used in data unit applications to prevent the disclosure of vital information to unauthorized users. A call with NDC assigned to either party is an FC blocked call. Because Flexible Calling (FC) is a set option, NDC calls are blocked when FC service is invoked.

Uniform Call Distribution

With explicit transfer, an FC subscriber can transfer a non-conference call to a Uniform Call Distribution (UCD) agent or UCD queue. If the UCD queue is full, the FC subscriber receives busy treatment.

Bridging

FC subscribers can call a UCD agent and bridge it into a conference. If the UCD agent is busy and the call goes to the UCD queue, the UCD queue can be bridged into the conference and the conference receives audible ringing from the UCD queue.

TRANSFER option

If the TRANSFER option is assigned to an FC subscriber, that caller can transfer calls to a UCD agent or a UCD queue.

Regardless of the data lled maximum conference size, an y FC conference made up of just three parties bridged together (for example, the controller, one conference participant, and the UCD agent) can transfer a conference participant to the UCD agent. Note that if the TRANSFER option is assigned, both explicit transfers (pressing the TRANSFER or XFER key) and implicit transfers (the controller going on-hook) are possible. If the UCD agent is busy and the call goes to the UCD queue, the conference participants can still be transferred into the UCD queue. If the TRANSFER option is not assigned, pressing the TRANSFER or XFER key has no effect; when the controller goes on-hook, the conference drops.

In addition, regardless of the data lled maximum conference size, an y FC conference made up of three parties not bridged together (for example, the controller consulting with the UCD agent while the conference participant is on hold) can transfer calls to a UCD agent. Note that for this call scenario, only explicit transfer is possible. If the UCD agent is busy and the call goes to the UCD queue, the conference participants can still be transferred into the UCD queue.

If the controller drops out of a conference with four or more parties bridged together and no one answers the call, the conference is dropped because there is no controller for the conference. However, if any of the bridged calls is answered, the conference “ oats."

DROP option

If the DROP option is assigned to an FC subscriber, the UCD agent or the audible ringing from an UCD queue call can be dropped from the conference. If one or more parties are added to the conference after the UCD agent, and it is required to drop the UCD agent, all parties added after the UCD agent must be dropped to get back to the UCD agent in the conference.

Flexible Calling (NI-2) (continued)

Activation/deactivation by the end user

Not applicable

Billing

-2) does not affect billing.

Station Message Detail Recording

-2) does not affect Station Message Detail Recording.

Data lling of ce parameter s

The following table shows the of ce parameters used by Fle xible Calling (NI-2). For more information about of ce parameters, refer to *Office Parameters Reference Manual.*

Of ce parameter s used by Flexible Calling (NI-2)

Table name	Parameter name	Explanation and action
OFCENG	MAX_NO_OF_3_PORTS_IN_CHAIN	This parameter is set to control the maximum number of 3-port circuits allowed in a flexible calling chain. The maximum number of conferees in the FC chain is equal to this parameter + 2. Enter a value between 2 and 20 (the default is 3).
	NO_OF_LARGE_FTR_DATA_BLKS	This parameter is used to ensure that sufficient software resources are available to conference calls. It is typically set to 500 (the range is 0 to 32767, and the default is 50). The number of medium feature data blocks required for flexible call chaining is a value three times the number of 3-port conference circuits allowed (as defined in office parameter MAX_NO_OF_3_PORTS_IN_CHAIN). Add this value to the existing value of NO_OF_LARGE_FTR_DATA_BLKS, and enter the total value. (For example, if the current value of parameter NO_OF_LARGE_FTR_DATA_BLKS is 500, and the value of parameter MAX_NO_OF_3_PORTS_IN_CHAIN is 3, the new value of this parameter is 509.)

Data ll sequence

The following table lists the tables that require data ll to implement Fle xible Calling (NI-2). The tables are listed in the order in which they are to be data lled.

Data ll tab les required for Flexible Calling (NI-2)

Table	Purpose of table
OFCENG	Office Engineering. This table contains data on engineering parameters for the office. Refer to “Datafilling office parameters" for how Flexible Calling (NI-2) affects office parameters.
KSETFEAT	Keyset Features. This table lists the features and options associated with the keyset, including the FC, TRANSFER, and DROP parameters. This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.
CUSTENG	Customer Engineering. This table contains engineering parameters related to customer groups, including the maximum number of 6-port conference circuits that can be in use simultaneously by a customer group (specified by option CONF6C).

Data lling tab le CUSTENG

The following table shows the data ll speci c to Fle xible Calling (NI-2) for table CUSTENG. Only those elds that apply directly to Fle xible Calling (NI-2) are shown. For a description of the other elds, refer to the data schema section of this document.

Note: Table CUSTENG needs to be data lled only once for each customer group.

Data lling tab le CUSTENG (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CUSTNAME		alphanumeric 1 to 16 characters	Customer group name. Enter the name assigned to the customer group.

Flexible Calling (NI-2) (continued)

Data lling tab le CUSTENG (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
OPTIONS		CONF6C	Option. Enter CONF6C, and datafill refinement MAX_NO_CNF6C.
	MAX_NO_CNF6C	0 to 2046	Maximum 6-port conference circuits. Enter the maximum number of 6-port conference circuits that can be allocated to the customer group at any one time. ***Note:*** To achieve the most efficient use of conference ports, the recommended values for MAX_NO_CNF6C are: 6, 10, 14, 18, 22, 28, and 30.

Data ll e xample for table CUSTENG

The following example shows sample data ll for Flexible Calling capability in table CUSTENG. In this example, 22 six-port conference circuits have been allocated to customer group BNRGRP12.

MAP display example for table CUSTENG

```
CUSTNAME NONCOS NOIBNTMT CONSOLES DOMAIN
    GROUPID OPTIONS
_____________________________________________________________

BNRGRP12 10     1         N        PRIVATE
          0 (CONF6C 22) $
```

Translation veri cation tools

-2) does not use translation veri cation tools.

SERVORD

SERVORD is used to assign the FC, CONFSIZE, TRANSFER, and DROP parameters to a terminal. SERVORD data lls table KSETFEA T, which lists the features and options associated with the keyset.

Parameter FC assigns the e xible calling capability to a feature key on an ISDN terminal. Prior to the NA008 release, FC could be provisioned on only one feature key on each terminal (a second assignment of FC was not permitted on a terminal). With the NA008 release, FC can be provisioned on

two feature keys on an ISDN terminal, as long as each instance has a unique maximum conference size (CONFSIZE) assigned to it.

Parameter CONFSIZE (conference size) determines the number of members allowed for conference calls initiated at the terminal:

- a conference size of three results in the use of a three-port circuit whenever a conference call is initiated from the terminal; three-port conferences can be chained together up to the limit of of ce parameter MAX_NO_OF_3_PORTS_IN_CHAIN
- a conference size greater than three results in the use of a six-port circuit; further six-port circuits are added to the existing conference bridge as conference members are added

Parameter TRANSFER (transfer) speci es whether the conference can be transferred from the controller to the remaining conferees, and de nes the transferring conditions as follows:

- CTALL allows any type of call to be transferred
- CTINC allows incoming calls to be transferred (when the original conference call is inter-customer group and the remaining conference call is intra-group)
- CTOUT allows incoming and outgoing calls to be transferred (when the original conference call is inter-customer group and the remaining conference call is intra-group)
- CTINTRA allows incoming and outgoing calls to be transferred when both the original conference call and the remaining conference call are intra-customer group members.
- CUSTOM allows the operating company to customize transfer conditions

Note: For conference sizes greater than three, only the CTALL and CTINTRA transfer types are valid.

To customize transfer conditions, four subparameters are de ned to specify the characteristics of the original conference call (referred to as the rst leg of the call) and the call that remains after the transfer (referred to as the second leg).

One of the following four subparameters is used to de ne the rst le g of the call:

- ORGINTER indicates that the controller is the originator of the call and the rst le g is inter-group
- ORGINTRA indicates that the controller is the originator of the call and the rst le g is intra-group

Flexible Calling (NI-2) (continued)

- TRMINTER indicates that the controller is the terminator of the call and the rst le g is inter-group
- TRMINTRA indicates that the controller is the terminator of the call and the rst le g is intra-group

For each transfer condition, one of the following ve values is selected to de ne the second le g of the call:

- AC indicates that transfer is allowed when the second leg of the call is to the attendant
- INTER indicates that transfer is allowed when the second leg is inter-group
- INTRA indicates that transfer is allowed when the second leg is intra-group
- TRATER indicates that transfer is allowed when the second leg is either inter-group or intra-group
- NOCXFER indicates that no transfer is allowed for the conditions de ned for the rst le g

TRANSFER_TYPE identi es one of the follo wing transfer types:

- NOTRANS indicates no call transfer.
- EXP indicates that the transfer type is explicit transfer only
- IMP indicates that the transfer type is implicit transfer

Note: When implicit TRANSFER is assigned to a feature key, both implicit and explicit transfers are allowed.

DROP allows the conference controller to drop the last user from the conference.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to Flexible Calling (NI-2):

- FC can be provisioned on up to two feature keys on an ISDN terminal, as long as each key has a unique assigned conference size (CONFSIZE). An attempt to add a new FC key to a terminal will be successful only if fewer than two FC keys are already assigned and the conference size of the new key is not a duplicate of any other FC key existing on the terminal.
- If one FC key and a TRANSFER key are provisioned on a terminal, FC cannot be removed until TRANSFER is removed.

- If two FC keys and a TRANSFER (non-primary DN (PDN)) key are provisioned on a terminal, one of the FC keys can be removed as long as the remaining FC key is on a lower feature key and is compatible with the TRANSFER call type. If the TRANSFER call type is not CTALL or CTINTRA, the remaining FC key must have a conference size of three.
- If two FC keys are assigned and TRANSFER is assigned to the PDN key, one of the FC keys can be removed as long as the remaining FC key is compatible with the TRANSFER call type. If the TRANSFER call type is not CTALL or CTINTRA, the remaining FC key must have a conference size of three. The previous requirement that TRANSFER exist on a higher feature key does not apply when TRANSFER is assigned to the PDN key.
- When FC with a conference size of three is provisioned on a key and a TRANSFER key with a call type other than CTALL or CTINTRA is assigned, the CHF (change feature information for pre-existing feature) command cannot change the conference size of the FC key with a size of three. The reason is because this must be the only compatible FC key for this TRANSFER. The other key must have a conference size greater than three. Changing the conference size will result in no compatible FC keys for this type of TRANSFER key.
- If one FC key and a DROP key are provisioned on a terminal, FC cannot be removed until DROP is removed.
- If two FC keys and a DROP key are provisioned on a terminal, one of the FC keys can be removed as long as the remaining FC key is on a lower feature key than the DROP feature key.

SERVORD prompts

The following table shows the SERVORD prompts used to assign the FC option to an LTID.

SERVORD prompts for Flexible Calling (NI-2)—FC option (Sheet 1 of 2)

Prompt	Valid input	Explanation
DN_OR_LEN	a logical terminal group name (1 to 8 alphanumeric characters), followed by a space and a terminal number (1 to 1022)	Directory or line equipment number. Enter the LTID that will identify the logical terminal.
OPTKEY	1 to 64	Option key. Enter the number of the key to be assigned to FC.

Flexible Calling (NI-2) (continued)

SERVORD prompts for Flexible Calling (NI-2)—FC option (Sheet 2 of 2)

Prompt	Valid input	Explanation
OPTION	FC	Option. Enter the FC option to enable the user to initiate a conference call on the terminal.
CONFSIZE	3 to 30	Conference size. Enter the number of members permitted in a conference call initiated on this terminal.

The following table shows the SERVORD prompts used to assign the TRANSFER option to an LTID.

SERVORD prompts for Flexible Calling (NI-2)—TRANSFER option (Sheet 1 of 4)

Prompt	Valid input	Explanation
DN_OR_LEN	a logical terminal group name (1 to 8 alphanumeric characters), followed by a space and a terminal number (1 to 1022)	Directory or line equipment number. Enter the LTID that will identify the logical terminal.
OPTKEY	1 to 64	Option key. Enter the number of the key to be assigned to TRANSFER.
OPTION	TRANSFER	Option. Enter the TRANSFER option to enable transfer of a conference call and define the allowable conditions for the transfer. ***Note:*** The FC option must be assigned to the LTID before TRANSFER can be assigned.

Flexible Calling (NI-2) (continued)

SERVORD prompts for Flexible Calling (NI-2)—TRANSFER option (Sheet 2 of 4)

Prompt	Valid input	Explanation
CXFERTYP	CTALL, CTINC, CTOUT, CTINTRA, CUSTOM	Call transfer type. Enter CTALL to specify that all calls can be transferred. Enter CTINC to specify that incoming calls can be transferred (when the original conference call is inter-customer group and the remaining call is intra-group). Enter CTOUT to specify that incoming and outgoing calls can be transferred (when the original conference call is inter-customer group and the remaining call is intra-customer-group). Enter CTINTRA to specify that incoming and outgoing calls can be transferred when both the original conference call and the remaining conference call are intra-customer group members. Enter CUSTOM to specify customized transfer conditions, and respond to the ORGINTER, ORGINTRA, TRMINTER, and TRMINTRA prompts. ***Note:*** For terminals with an FC CONFSIZE greater than 3, only CTALL and CTINTRA are valid.
ORGINTER	AC, INTRA, INTER, TRATER, NOCXFER	Originated inter-group transfer. Enter AC to indicate that an inter-group call originated by the controller can be transferred when the second leg is to the attendant. Enter INTRA to indicate that an inter-group call originated by the controller can be transferred when the second leg is intra-group. Enter INTER to indicate that an inter-group call originated by the controller can be transferred when the second leg is inter-group. Enter TRATER to indicate that an inter-group call originated by the controller can be transferred when the second leg is either intra-group or inter-group. Enter NOCXFER to indicate that an inter-group call originated by the controller can not be transferred.

Flexible Calling (NI-2) (continued)

SERVORD prompts for Flexible Calling (NI-2)—TRANSFER option (Sheet 3 of 4)

Prompt	Valid input	Explanation
ORGINTRA	AC, INTRA, INTER, TRATER, NOCXFER	Originated intra-group transfer. Enter AC to indicate that an intra-group call originated by the controller can be transferred when the second leg is to the attendant. Enter INTRA to indicate that an intra-group call originated by the controller can be transferred when the second leg is intra-group. Enter INTER to indicate that an intra-group call originated by the controller can be transferred when the second leg is inter-group. Enter TRATER to indicate that an intra-group call originated by the controller can be transferred when the second leg is either intra-group or inter-group. Enter NOCXFER to indicate that an intra-group call originated by the controller can not be transferred.
TRMINTER	AC, INTRA, INTER, TRATER, NOCXFER	Terminated inter-group transfer. Enter AC to indicate that an inter-group call terminated by the controller can be transferred when the second leg is to the attendant. Enter INTRA to indicate that an inter-group call terminated by the controller can be transferred when the second leg is intra-group. Enter INTER to indicate that an inter-group call terminated by the controller can be transferred when the second leg is inter-group. Enter TRATER to indicate that an inter-group call terminated by the controller can be transferred when the second leg is either intra-group or inter-group. Enter NOCXFER to indicate that an inter-group call terminated by the controller can not be transferred.

Flexible Calling (NI-2) (continued)

SERVORD prompts for Flexible Calling (NI-2)—TRANSFER option (Sheet 4 of 4)

Prompt	Valid input	Explanation
TRMINTRA	AC, INTRA, INTER, TRATER, NOCXFER	Terminated intra-group transfer. Enter AC to indicate that an intra-group call terminated by the controller can be transferred when the second leg is to the attendant. Enter INTRA to indicate that an intra-group call terminated by the controller can be transferred when the second leg is intra-group. Enter INTER to indicate that an intra-group call terminated by the controller can be transferred when the second leg is inter-group. Enter TRATER to indicate that an intra-group call terminated by the controller can be transferred when the second leg is either intra-group or inter-group. Enter NOCXFER to indicate that an intra-group call terminated by the controller can not be transferred.
TRANSFER_TYPE	NOTRANS, EXP, IMP	Transfer invocation types associated with the option. Enter NOTRANS to indicate no call transfer. Enter EXP to indicate an explicit transfer only. Enter IMP to indicate an implicit transfer. ***Note:*** If implicit TRANSFER is assigned to a feature key, both implicit and explicit transfers are allowed.

Flexible Calling (NI-2) (continued)

The following table shows the SERVORD prompts used to assign the DROP option to an LTID.

SERVORD prompts for Flexible Calling (NI-2)—DROP option

Prompt	Valid input	Explanation
DN_OR_LEN	a logical terminal group name (1 to 8 alphanumeric characters), followed by a space and a terminal number (1 to 1022)	Directory or line equipment number. Enter the LTID that identifies the logical terminal.
OPTKEY	1 to 64	Option key. Enter the number of the key to be assigned to DROP. ***Note:*** The key assigned to DROP must be numerically higher than the key assigned to FC (for instance, if the FC key is 6, the DROP key must be 7 or higher).
OPTION	DROP	Option. Enter the DROP option to enable the controller to release the last-joining conferee from the conference. ***Note:*** The FC option must be assigned to this LTID before DROP can be assigned.

SERVORD example for adding Flexible Calling (NI-2)

The following SERVORD example shows how Flexible Calling (NI-2) is added to LTID ISDN 303 using the ADO command. In this example, options FC, TRANSFER (customized to allow transfer only for calls within the customer group), and DROP are assigned to the LTID.

SERVORD example for Flexible Calling (NI-2) in prompt mode

```
SO:
> ADO
SONUMBER: NOW 93 04 31
> (CR)
DN_OR_LEN:
>ISDN 303
OPTKEY:
> 4
OPTION:
> FC
CONFSIZE:
> 3
OPTKEY:
> 5
OPTION:
> TRANSFER
TRANSFER_TYPE:
> EXP
CXFERTYP:
> CUSTOM
ORGINTER:
> NOCXFER
ORGINTRA:
> INTRA
TRMINTER:
> NOCXFER
TRMINTRA:
> INTRA
OPTKEY:
> 6
OPTION:
> DROP
OPTKEY:
> $
```

SERVORD example for Flexible Calling (NI-2) in no-prompt mode

```
> ADO $  ISDN 303 4 FC 3 5 TRANSFER EXP CUSTOM NOCXFER INTRA
NOCXFER INTRA 6 DROP $
```

SERVORD example for adding a duplicate appearance of Flexible Calling (NI-2)

The following SERVORD example shows an attempt to add a duplicate appearance of FC with a maximum conference size of 6 to feature key 19 on an ISDN terminal using the ADO command. In this example, it is assumed

Flexible Calling (NI-2) (end)

that feature key 17 on the terminal already has FC assigned with a maximum conference size of 6. Since more than one instance of FC with the same maximum conference size cannot be added on an ISDN terminal, an error message is displayed and the SERVORD request is denied.

SERVORD example for Flexible Calling (NI-2) in prompt mode

```
SO:
> ADO
SONUMBER: NOW 97 9 10 PM
> (CR)
DN_OR_LEN:
> ISDN 303
OPTKEY:
> 19
OPTION:
> FC
CONFSIZE:
> 6
OPTKEY:
> $
COMMAND AS ENTERED:
ADO NOW 97 9 10 PM ISDN 303 (19 FC 6 ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y
There already exists a conference size 6 on key 17
FC did NOT pass checking.
COMMAND AS ENTERED:
ADO NOW 97 9 10 PM ISDN 303 (19 FC 6 ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>
```

SERVORD example for Flexible Calling (NI-2) in no-prompt mode

```
> ADO $ ISDN 303 19 FC 6 $ Y

There already exists a conference size 6 on key 17
FC did NOT pass checking.
```

ISDN BRI Access to CLASS ACB/AR

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA013 and up

Prerequisites

To operate, ISDN BRI Access to CLASS ACB/AR has the following prerequisites:

- BAS Generic, BAS00003
- MDC Minimum, MDC00001
- MDC Standard, MDC00003
- RES Service Enablers, RES00006

Network con guration

Common Channel Signaling No. 7 (CCS7) connectivity is required for network (interof ce) con guration of Call Setup. The follo wing feature packages are required for CCS7 connectivity:

- Base ISUP, ISP70001
- TEL00008, TEL CCS7 Base

Description

ISDN BRI Access to CLASS ACB/AR provides ISDN Basic Rate Interface (BRI) subscribers using National ISDN 2 (NI-2) terminals access to the Custom Area Local Signaling Services (CLASS) Automatic Call Back (ACB) and Automatic Recall (AR) features.

The ISDN ACB feature enables a subscriber to place a call to the last station called by the subscriber. The ISDN AR feature enables a subscriber to place a call to the last station that called the subscriber. With ISDN ACB, the last station called by the subscriber can be busy or idle. With ISDN AR, the last call received by the subscriber can be answered or unanswered. The last station that called the subscriber can be busy or idle. The subscriber need only complete the ISDN ACB or AR activation procedure, and both the busy or idle status and the class of service of the destination line are checked. If the terminating line is idle and the class of service permits, call setup is attempted. If the call cannot be completed immediately because of a busy line, the call is queued, and call completion is attempted when both stations are idle. As part

ISDN BRI Access to CLASS ACB/AR (continued)

of the completion attempt, the calling station is given special ringing. When the subscriber answers, the call is set up, and the called station is given regular ringing.

ISDN ACB and AR provide the same functionality as CLASS ACB and AR to subscribers using ISDN terminals. ISDN ACB and AR apply to both voice and data calls, and are supported for the following bearer capabilities data lled in table BCDEF (Bearer Capability De nition): SPEECH, 3_1KHZ, 64KDATA, and 56KDATA.

Operation

With ISDN ACB or AR activated, the busy or idle status of the called and calling lines is checked periodically until call setup is attempted or a time-out occurs. Both parties can originate and receive calls without affecting the ISDN ACB or AR status. A subscriber can have up to 30 ISDN ACB or AR activations in effect at the same time. Multiple ISDN ACB or AR activations to the same directory number (DN) from different sources are also permitted.

Comparison and contrast of ISDN ACB and AR

ISDN ACB and AR are very similar features. When ACB and AR are activated as one-level procedures from an ISDN terminal, the activation procedures are identical (with the exception of the ACB toggle key). ISDN AR can also be activated as a two-level procedure. When ISDN AR is activated, the subscriber hears an announcement stating the DN, date, and time of the most recent incoming call received by the subscriber. The subscriber is then instructed to dial the digit 1 to activate ISDN AR, or to hang up to abort ISDN AR.

ISDN ACB and AR deactivation procedures are identical, with the exception of the access code.

ISDN ACB can be assigned to a key referred to as a toggle key. When the subscriber presses the DN key followed by the ACB toggle key, ISDN ACB is activated and the ACB lamp is lit. If the subscriber presses the ISDN ACB toggle key when there are outstanding ISDN ACB requests, all the requests are deactivated.

Note: ISDN ACB can be assigned to any key on an ISDN terminal except the DN key. ISDN AR must be assigned to the DN key.

Data ll f or ISDN ACB and AR announcements

The ISDN ACB and AR features must have announcements de ned in order to work properly. To set up an announcement, the following tables must be data lled and an announcement recorded. Announcements are recorded using

digital recorded announcement machine (DRAM) commands at the MAP (maintenance and administration position).

- DRAMS (Digital Recorded Announcement Machine)
- CLLI (Common Language Location Identi er)
- ANNS (Announcement)
- ANNMEMS (Announcement Members)
- DRMUSERS (Digital Recorded Announcement Machine Users)

The following sections show recommended data ll for tables DRAMS, CLLI, ANNS, ANNMEMS, and DRMUSERS. Refer to *DRAM and EDRAM Guide*, 297-1001-527, for more information on data lling announcements.

Note: Before data lling announcements for ISDN A CB and AR, read "Appendix A Data lling announcements" for Subscriber Services general announcement information.

Table DRAMS

Table DRAMS de nes the DRAM cards to be used to store the announcements required for ISDN ACB and AR. The following example shows sample data ll for the ISDN A CB and AR features in table DRAMS.

```
DRAMCARD TMTYPE   TMNO    TMCKT      CARDCODE     CARDINFO
_____________________________________________________________
    2  0   MTM     4        0         1X75BA          CTLR
    2  1   MTM     4        2         1X76AJ      PROM 0 1
    2  3   MTM     4        6         1X76AK      PROM 2 3
    2  5   MTM     4       10         1X76AM      PROM 4 5
```

Table CLLI

Table CLLI contains the CLASS common language location identi er (CLLI) de nition specifying the maximum number of announcement members for all CLASS applications. The following example shows sample data ll for the ISDN ACB and AR features in table CLLI.

```
CLLI         ADNUM        TRKGRSIZ     ADMININF
_____________________________________________________
  DRAM2      403          10           DRAM_MTM_4
CLASSANN     404          10           CLASS_ANN_CLLI
```

ISDN BRI Access to CLASS ACB/AR (continued)

Table ANNS

Table ANNS further re nes the announcement speci cation. The announcement type is speci ed to be a CLASS custom announcement. Since only one line can be connected to an announcement member at any one time, the maximum number of connections (MAXCONN) is set to 1. The cycle time (CYTIME) is set to 0 and is determined internally. Field MAXCYC is ignored by the ISDN ACB and AR features.

The following example shows sample data ll for the ISDN A CB and AR features in table ANNS.

```
CLLI        ANTYPE    TRAFSNO MAXCONN CYTIME MAXCYC
_____________________________________________________
CLASSANN   CLASS          30       1       0     1
```

Table ANNMEMS

Table ANNMEMS de nes the circuits to be assigned to the various members of the CLASS announcement group.

The following example shows sample data ll for the ISDN A CB and AR features in table ANNMEMS.

```
 ANNMEM    HDWTYPE     CARD                    MEMINFO
_____________________________________________________
CLASS  1       DRAM      DRA  ( 0 MTM 1 4 ) $
CLASS  2       DRAM      DRA  ( 0 MTM 1 5 ) $
CLASS  3       DRAM      DRA  ( 0 MTM 1 6 ) $
```

Assigning phrase names using the DRAMREC utility

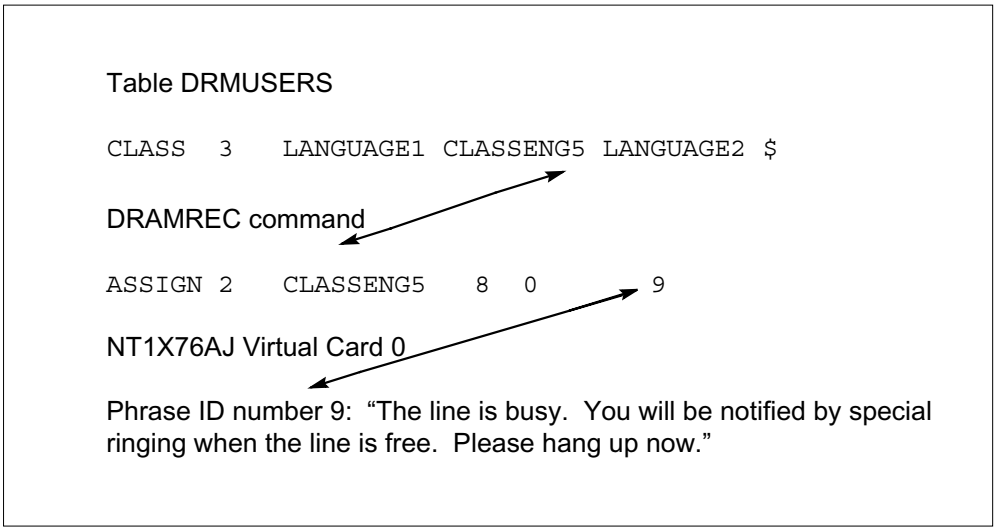
Once tables DRAMS, CLLI, ANNS, and ANNMEMS have been data lled, the logical phrase names can be assigned to the physical phrases. To do this, enter the DRAMREC utility and use the ASSIGN command to assign the phrase names to the location on the DRAM. Note that all phrases to be combined into announcements must reside under the same DRAM controller.

Example of CLASS announcements

The following gure sho ws how phrase names from table DRMUSERS are assigned to the location in the DRAM. CLASS announcement 3 in table DRMUSERS is the AR con rmation one-level announcement and is made up of phrases LANGUAGE1, CLASSENG5, and LANGUAGE2. The CLASSENG5 phrase is assigned, through the DRAMREC utility, to

NT1X76AJ Virtual Card 0 Phrase ID number 9. NT1X76AJ Virtual Card 0 Phrase ID number 9 reads “The line is busy. You will be noti ed by special ringing when the line is free. Please hang up now."

Example of CLASS announcements



Example of phrase assignments

The following example shows sample phrase assignments for DRAMREC.

ISDN BRI Access to CLASS ACB/AR (continued)

Example of phrase assignments using DRAMREC

```
DRAMREC:
 <command> <dram> <phrasename> <length> <block> <phraseno>

(for 1X76AJ Virtual Card 0)
 ASSIGN 2  CLASSENG1   9    0     5
 ASSIGN 2  CLASSENG2   9    0     6
 ASSIGN 2  CLASSENG3   5    0     7
 ASSIGN 2  CLASSENG4  10    0     8
 ASSIGN 2  CLASSENG5   8    0     9
 ASSIGN 2  CLASSENG6   5    0    10
 ASSIGN 2  CLASSENG7   6    0    11
 ASSIGN 2  CLASSENG8   5    0    12
 ASSIGN 2  CLASSENG9   9    0    13
 ASSIGN 2  CLASSENG10  1    0    14
 ASSIGN 2  CLASSENG18  1    0     2

(for 1X76AJ Virtual Card 1)
 ASSIGN 2  CLASSENG11  7    1     4
 ASSIGN 2  CLASSENG12  8    1     5
 ASSIGN 2  CLASSENG13  8    1     6
 ASSIGN 2  CLASSENG14 10    1     7

(for 1X76AK Virtual Card 0)
 ASSIGN 2  CLASSENG15 10    2     4
 ASSIGN 2  CLASSENG16  3    2     5
 ASSIGN 2  CLASSENG17  5    2     6
```

Note 1: The block number comes from card information in table DRAMS.

Note 2: The virtual card slot number and block numbers are the same.

Table DRMUSERS

Table DRMUSERS associates the phrases for each announcement to an announcement member. Each announcement is identi ed by a CLLI (CLASS in this case) and a number. The number determines the type of the ISDN ACB or AR announcement.

Phrases can be built by linking one or more labels (from DRAMREC) together. All phrases start with the system-de ned label LANGUAGE1. LANGUAGE2 can be used to specify a secondary language, and SILENCE can be used to insert a 1-s period of silence into a phrase.

The following example shows data ll for the ISDN A CB and AR features in table DRMUSERS.

```
USERANN  PHSLIST
_____________________________________________________________________
CLASS 3      (LANGUAGE1) (CLASSENG5) $
CLASS 4      (LANGUAGE1) (CLASSENG11) $
CLASS 5      (LANGUAGE1) (CLASSENG8) $
CLASS 6      (LANGUAGE1) (CLASSENG10) (CLASSENG4)
             (CLASSENG10) $
CLASS 7      (LANGUAGE1) (CLASSENG6) $
CLASS 8      (LANGUAGE1) (CLASSENG12) $
CLASS 9      (LANGUAGE1) (CLASSENG7) (CLASSENG8)$
CLASS 10     (LANGUAGE1) (CLASSENG16) (ENGVARDNF)
             (CLASSENG17)$
CLASS 11     (LANGUAGE1) (CLASSENG10) (CLASSENG5)
             (CLASSENG10) $
CLASS 12     (LANGUAGE1) (SILENCE) (CLASSENG11) $
CLASS 13     (LANGUAGE1) (SILENCE) (CLASSENG8) $
CLASS 14     (LANGUAGE1) (CLASSENG10) (CLASSENG2)
             (CLASSENG10) $
CLASS 15     (LANGUAGE1) (CLASSENG15) $
CLASS 16     (LANGUAGE1) (CLASSENG13) $
CLASS 17     (LANGUAGE1) (CLASSENG3) $
```

The following table describes the use of each announcement shown in the previous example.

Descriptions of announcements de ned in tab le DRMUSERS (Sheet 1 of 2)

Announcement or number	Description of function
CLASS 3	AR confirmation one-level
CLASS 4	AR short-term denial one-level
CLASS 5	AR long-term denial one-level
CLASS 6	Called line busy, scanning will be resumed
CLASS 7	AR deactivation
CLASS 8	AR two-level activation with private DN
CLASS 9	AR two-level activation with invalid DN
CLASS 10	AR two-level activation with voiced DN
CLASS 11	AR confirmation two-level

ISDN BRI Access to CLASS ACB/AR (continued)

Descriptions of announcements de ned in tab le DRMUSERS (Sheet 2 of 2)

Announcement or number	Description of function
CLASS 12	AR short-term denial two-level
CLASS 13	AR long-term denial two-level
CLASS 14	ACB confirmation
CLASS 15	ACB short-term denial
CLASS 16	ACB long-term denial
CLASS 17	ACB deactivation

Note: Refer to “Appendix C Quick reference for logical phrase ENGDATIME" for date and time data ll for the AR tw o-level activation announcement.

Announcement scripts

There are a number of custom announcements designed for use with the ISDN ACB and AR features. These announcements are PROM-based DRAM recordings. The four DRAM cards that are required to support these announcements are NT1X76AJ, NT1X76AK, NT1X76JA, and NT1X76JB. Standard announcements, supported by 1X76AA cards, are PROM-based DRAM recordings, which are usually provided by Northern Telecom. Customized announcements, supported by 1X77AA cards, are RAM-based recordings, which are generally recorded on-site by operating company personnel. The following tables list the phrase names, phrase IDs, time required (in seconds), and associated scripts contained on each card. The virtual card numbers listed in these tables are the same as block numbers.

Note: When linking phrases that require digit collection, ensure that the total time of the played announcements does not exceed 40 s.

DRAM announcements (NT1X76AJ virtual card 0) (Sheet 1 of 2)

Phrase name	Phrase ID	Time (seconds)	Content
CENG1	000	2	1-s silence
CENG2	001	1	750-Hz test tone
CENG3	002	1	Prompt tone/silence/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence

DRAM announcements (NT1X76AJ virtual card 0) (Sheet 2 of 2)

Phrase name	Phrase ID	Time (seconds)	Content
CENG4	003	1	0.25-s silence
CENG5	004	0	NIL
CENG6	005	9	“The line was free, but it has just become busy again. You will be notified by special ringing when the line is free. Please hang up now."
CENG7	006	8	“The last number that you called is busy. You will be notified by special ringing when the line is free. Please hang up now."
CENG8	007	5	“You have canceled all of your requests to call someone back. Please hang up now."
CENG9	008	10	“The line was free, but it has just become busy again. You will be notified by special ringing when the line is free. Please hang up now."
CENG10	009	8	“The line is busy. You will be notified by special ringing when the line is free. Please hang up now."
CENG11	00A	5	“You have canceled all of your requests to return calls. Please hang up now."
CENG12	00B	6	“We're sorry, the last number that called your line is not known. Please hang up now."
CENG13	00C	5	“We're sorry, the number cannot be reached by this method. Please hang up now."
CENG14	00D	9	“The last call to your telephone has been traced. If you want to take action, contact your police department. Please hang up now."
CENG15	00E	1	Busy signal

DRAM announcements (NT1X76AJ virtual card 1) (Sheet 1 of 2)

Phrase name	Phrase ID	Time (seconds)	Content
CENG1	000	2	1-s silence
CENG2	001	1	750-Hz test tone

ISDN BRI Access to CLASS ACB/AR (continued)

DRAM announcements (NT1X76AJ virtual card 1) (Sheet 2 of 2)

Phrase name	Phrase ID	Time (seconds)	Content
CENG3	002	1	Silence (prompt tone)/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence
CENG4	003	1	0.25-s silence
CENG5	004	7	“We're sorry, the number cannot be reached now by this method. Please hang up and try again later."
CENG6	005	8	“The last number that called your line cannot be given out. If you want to call this number, enter “1"; otherwise, hang up now."
CENG7	006	8	“We're sorry, the last number that you called cannot be reached by this method. Please hang up and call the number directly."
CENG8	007	10	“The last call to your telephone cannot be traced. Please consult the introductory pages of your telephone directory for further instructions. Please hang up now."

DRAM announcements (NT1X76AK virtual card 0)

Phrase name	Phrase ID	Time (seconds)	Content
SILENCE	000	2	1-s silence
CENG2	001	1	750-Hz test tone
CENG3	002	1	Silence (prompt tone)/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence
CENG4	003	1	0.25-s silence
CENG7	004	10	“We're sorry, the last number that you called cannot be reached now by this method. Please hang up and try again later or call the number directly."
CENG16	005	3	“The last number that called your line was . . ."
CENG17	006	5	“To call this number, enter “1"; otherwise, hang up now."

Note: Phrase numbers 4 to 63 listed in the following table are various intonations of the digits from 0 to 9. These phrases cannot be voiced back using DRAMREC playback.

DRAM announcements (NT1X76AK virtual card 1) (Sheet 1 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
CENG1	000	2	1-s silence
CENG2	001	1	750-Hz test tone
CENG3	002	1	Silence (prompt tone)/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence
CENG4	003	1	0.25-s silence
EHIRI0	004	1	Zero (high rising intonation)
EHIRI1	005	1	One
EHIRI2	006	1	Two
EHIRI3	007	1	Three
EHIRI4	008	1	Four
EHIRI5	009	1	Five
EHIRI6	010	1	Six
EHIRI7	011	1	Seven
EHIRI8	012	1	Eight
EHIRI9	013	1	Nine
ELORI0	014	1	Zero (low rising intonation)
ELORI1	015	1	One
ELORI2	016	1	Two
ELORI3	017	1	Three
ELORI4	018	1	Four
ELORI5	019	1	Five
ELORI6	020	1	Six

ISDN BRI Access to CLASS ACB/AR (continued)

DRAM announcements (NT1X76AK virtual card 1) (Sheet 2 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
ELORI7	021	1	Seven
ELORI8	022	1	Eight
ELORI9	023	1	Nine
EWAVE0	024	1	Zero (wavering tone)
EWAVE1	025	1	One
EWAVE2	026	1	Two
EWAVE3	027	1	Three
EWAVE4	028	1	Four
EWAVE5	029	1	Five
EWAVE6	030	1	Six
EWAVE7	031	1	Seven
EWAVE8	032	1	Eight
EWAVE9	033	1	Nine
EFALL0	034	1	Zero (falling tone)
EFALL1	035	1	One
EFALL2	036	1	Two
EFALL3	037	1	Three
EFALL4	038	1	Four
EFALL5	039	1	Five
EFALL6	040	1	Six
EFALL7	041	1	Seven
EFALL8	042	1	Eight
EFALL9	043	1	Nine
EFLTA0	044	1	Zero (flat tone)

DRAM announcements (NT1X76AK virtual card 1) (Sheet 3 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
EFLTA1	045	1	One
EFLTA2	046	1	Two
EFLTA3	047	1	Three
EFLTA4	048	1	Four
EFLTA5	049	1	Five
EFLTA6	050	1	Six
EFLTA7	051	1	Seven
EFLTA8	052	1	Eight
EFLTA9	053	1	Nine
EFLTB0	054	1	Zero (flat B tone)
EFLTB1	055	1	One
EFLTB2	056	1	Two
EFLTB3	057	1	Three
EFLTB4	058	1	Four
EFLTB5	059	1	Five
EFLTB6	060	1	Six
EFLTB7	061	1	Seven
EFLTB8	062	1	Eight
EFLTB9	063	1	Nine

DRAM announcements (NT1X76JA virtual card 0) (Sheet 1 of 4)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG1	000	2	1-s silence
CLASSENG2	001	1	750-Hz test tone

ISDN BRI Access to CLASS ACB/AR (continued)

DRAM announcements (NT1X76JA virtual card 0) (Sheet 2 of 4)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG3	002	1	Silence (prompt tone)/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence
CLASSENG4	003	1	0.25-s silence
CLASSENG5	004	1	Zero (high rising intonation)
CLASSENG6	005	1	One
CLASSENG7	006	1	Two
CLASSENG8	007	1	Three
CLASSENG9	008	1	Four
CLASSENG10	009	1	Five
CLASSENG11	00A	1	Six
CLASSENG12	00B	1	Seven
CLASSENG13	00C	1	Eight
CLASSENG14	00D	1	Nine
CLASSENG15	00E	1	Zero (low rising intonation)
CLASSENG16	00F	1	One
CLASSENG17	010	1	Two
CLASSENG18	011	1	Three
CLASSENG19	012	1	Four
CLASSENG20	013	1	Five
CLASSENG21	014	1	Six
CLASSENG22	015	1	Seven
CLASSENG23	016	1	Eight
CLASSENG24	017	1	Nine
CLASSENG25	018	1	Zero (wavering tone)

DRAM announcements (NT1X76JA virtual card 0) (Sheet 3 of 4)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG26	019	1	One
CLASSENG27	01A	1	Two
CLASSENG28	01B	1	Three
CLASSENG29	01C	1	Four
CLASSENG30	01D	1	Five
CLASSENG31	01E	1	Six
CLASSENG32	01F	1	Seven
CLASSENG33	020	1	Eight
CLASSENG34	021	1	Nine
CLASSENG35	022	1	Zero (falling tone)
CLASSENG36	023	1	One
CLASSENG37	024	1	Two
CLASSENG38	025	1	Three
CLASSENG39	026	1	Four
CLASSENG40	027	1	Five
CLASSENG41	028	1	Six
CLASSENG42	029	1	Seven
CLASSENG43	02A	1	Eight
CLASSENG44	02B	1	Nine
CLASSENG45	02C	1	Zero (flat tone)
CLASSENG46	02D	1	One
CLASSENG47	02E	1	Two
CLASSENG48	02F	1	Three
CLASSENG49	030	1	Four

ISDN BRI Access to CLASS ACB/AR (continued)

DRAM announcements (NT1X76JA virtual card 0) (Sheet 4 of 4)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG50	031	1	Five
CLASSENG51	032	1	Six
CLASSENG52	033	1	Seven
CLASSENG53	034	1	Eight
CLASSENG54	035	1	Nine
CLASSENG55	036	1	Zero (flat B tone)
CLASSENG56	037	1	One
CLASSENG57	038	1	Two
CLASSENG58	039	1	Three
CLASSENG59	03A	1	Four
CLASSENG60	03B	1	Five
CLASSENG61	03C	1	Six
CLASSENG62	03D	1	Seven
CLASSENG63	03E	1	Eight
CLASSENG64	03F	1	Nine

DRAM announcements (NT1X76JA virtual card 1) (Sheet 1 of 2)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG1	000	2	1-s silence
CLASSENG2	001	1	750-Hz test tone
CLASSENG3	002	1	Silence (prompt tone)/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence
CLASSENG4	003	1	0.25-s silence
CLASSENG16	004	3	“The last number that called your line was . . ."
CLASSENG22	005	3	“This call was received on: . . ."

DRAM announcements (NT1X76JA virtual card 1) (Sheet 2 of 2)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG12	006	6	“The last number that called your line cannot be given out. This call was received on: . . ."
CLASSENG7	007	6	“We're sorry, the last number that called your line is not known. This call was received on: . . ."
CLASSENG17	008	5	“To call this number, enter “1"; otherwise, hang up now."
CLASSENG23	009	2	“Please hang up now."

DRAM announcements (NT1X76JB virtual card 0) (Sheet 1 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG1	000	2	1-s silence
CLASSENG2	001	1	750-Hz test tone
CLASSENG3	002	1	Silence (prompt tone)/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence
CLASSENG4	003	1	0.25-s silence
ENGJANUARY	004	1	January
ENGFEBRUAR	005	1	February
ENGMARCH	006	1	March
ENGAPRIL	007	1	April
ENGMAY	008	1	May
ENGJUNE	009	1	June
ENGJULY	00A	1	July
ENGAUGUST	00B	1	August
ENGSEPTEMB	00C	1	September
ENGOCTOBER	00D	1	October
ENGNOVEMBE	00E	1	November

ISDN BRI Access to CLASS ACB/AR (continued)

DRAM announcements (NT1X76JB virtual card 0) (Sheet 2 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
ENGDECEMBE	00F	1	December
ENGAM	010	1	AM.
ENGPM	011	1	PM.
ENGAT	012	1	At
ENGNUM01	013	1	Oh-one
ENGNUM02	014	1	Oh-two
ENGNUM03	015	1	Oh-three
ENGNUM04	016	1	Oh-four
ENGNUM05	017	1	Oh-five
ENGNUM06	018	1	Oh-six
ENGNUM07	019	1	Oh-seven
ENGNUM08	01A	1	Oh-eight
ENGNUM09	01B	1	Oh-nine
ENGNUM1	01C	1	One
ENGNUM2	01D	1	Two
ENGNUM3	01E	1	Three
ENGNUM4	01F	1	Four
ENGNUM5	020	1	Five
ENGNUM6	021	1	Six
ENGNUM7	022	1	Seven
ENGNUM8	023	1	Eight
ENGNUM9	024	1	Nine
ENGNUM10	025	1	Ten
ENGNUM11	026	1	Eleven

DRAM announcements (NT1X76JB virtual card 0) (Sheet 3 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
ENGNUM12	027	1	Twelve
ENGNUM13	028	1	Thirteen
ENGNUM14	029	1	Fourteen
ENGNUM15	02A	1	Fifteen
ENGNUM16	02B	1	Sixteen
ENGNUM17	02C	1	Seventeen
ENGNUM18	02D	1	Eighteen
ENGNUM19	02E	1	Nineteen
ENGNUM20	02F	1	Twenty
ENGNUM21	030	1	Twenty-one
ENGNUM22	031	1	Twenty-two
ENGNUM23	032	1	Twenty-three

DRAM announcements (NT1X76JB virtual card 1) (Sheet 1 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
CLASSENG1	000	2	1-s silence
CLASSENG2	001	1	750-Hz test tone
CLASSENG3	002	1	Silence (prompt tone)/750-Hz tone/silence/ 750-Hz tone/silence/750-Hz tone/silence
CLASSENG4	003	1	0.25-s silence
ENGNUM24	004	1	Twenty-four
ENGNUM25	005	1	Twenty-five
ENGNUM26	006	1	Twenty-six
ENGNUM27	007	1	Twenty-seven
ENGNUM28	008	1	Twenty-eight

ISDN BRI Access to CLASS ACB/AR (continued)

DRAM announcements (NT1X76JB virtual card 1) (Sheet 2 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
ENGNUM29	009	1	Twenty-nine
ENGNUM30	00A	1	Thirty
ENGNUM31	00B	1	Thirty-one
ENGNUM32	00C	1	Thirty-two
ENGNUM33	00D	1	Thirty-three
ENGNUM34	00E	1	Thirty-four
ENGNUM35	00F	1	Thirty-five
ENGNUM36	010	1	Thirty-six
ENGNUM37	011	1	Thirty-seven
ENGNUM38	012	1	Thirty-eight
ENGNUM39	013	1	Thirty-nine
ENGNUM40	014	1	Forty
ENGNUM41	015	1	Forty-one
ENGNUM42	016	1	Forty-two
ENGNUM43	017	1	Forty-three
ENGNUM44	018	1	Forty-four
ENGNUM45	019	1	Forty-five
ENGNUM46	01A	1	Forty-six
ENGNUM47	01B	1	Forty-seven
ENGNUM48	01C	1	Forty-eight
ENGNUM49	01D	1	Forty-nine
ENGNUM50	01E	1	Fifty
ENGNUM51	01F	1	Fifty-one
ENGNUM52	020	1	Fifty-two

ISDN BRI Access to CLASS ACB/AR (continued)

DRAM announcements (NT1X76JB virtual card 1) (Sheet 3 of 3)

Phrase name	Phrase ID	Time (seconds)	Content
ENGNUM53	021	1	Fifty-three
ENGNUM54	022	1	Fifty-four
ENGNUM55	023	1	Fifty-five
ENGNUM56	024	1	Fifty-six
ENGNUM57	025	1	Fifty-seven
ENGNUM58	026	1	Fifty-eight
ENGNUM59	027	1	Fifty-nine

Ringing patterns for ISDN ACB and AR

Ringing patterns for ISDN ACB and AR are data lled in table CUSTSTN (Customer Group Station Option).

Reverse translations for ISDN ACB and AR

The ISDN ACB and AR features convert a DN between the following formats:

- the 10-digit format (NPA-NXX-XXXX) of
  - — the calling number supplied to the call destination by the CLASS base capabilities
  - — the called number required by the transaction capability application part (TCAP) application used by ISDN ACB and AR to monitor a busy destination line
- the 7-, 8-, 10-, and 11-digit formats of
  - — the numbers dialed by the ISDN ACB or AR subscriber to make local, local toll, 10-digit local, and toll calls
  - — the dialable calling numbers displayed to a subscriber using the CLASS Dialable Number Delivery (DDN) feature

Note: The 7-, 8-, and 11-digit dialing requirements are used by most subscribers using the North American public dial plan. In a few cases, subscribers dial a 10-digit number for local calls. For these calls, no conversion is carried out for ISDN AR; ISDN AR uses the number as stored in the incoming call memory (ICM).

ISDN BRI Access to CLASS ACB/AR (continued)

The process used to convert the 10-digit numbers is called reverse translations. Reverse translations uses two tables:

- Table DNREGION (DN Region) groups DNs into regions.
- Table DNREVXLA (DN Reverse Translations) contains sets of digit manipulation algorithms.

Together, these two tables are used by reverse translations to process the following types of calls:

- ISDN AR calls, when conversion is required between the 10-digit format (as held in the ICM) and the 7-, 8-, or 11-digit dialed format used for call setup
- some ISDN ACB calls, when conversion from a 7-digit dialed format into a 10-digit format requires selection of the correct numbering plan area (NPA)

The following table shows examples of the conversions required by service applications.

Examples of service applications of reverse translations (Sheet 1 of 2)

Application	DN available	DN required	Manipulation required
AR: dial DN within same local calling area	10-digit DN from ICM	7-digit DN	Delete area code
AR: dial DN within same area code but outside local calling area	10-digit DN from ICM	1 + 7-digit DN	Delete area code and add prefix of 1
AR: dial DN in another area code	10-digit DN from ICM	1 + 10-digit DN	Add prefix of 1
ACB: monitor a busy DN within same local calling area	7-digit DN from outgoing call memory (OCM)	10-digit DN (required by TCAP application)	Add area code
ACB: monitor a busy DN in another area code	11-digit DN from OCM	10-digit DN (for TCAP)	Delete prefix

Examples of service applications of reverse translations (Sheet 2 of 2)

Application	DN available	DN required	Manipulation required
Calling Number Delivery (CND): display dialable calling DN for call from within same local calling area	10-digit DN (as received from call origin)	7-digit DN	Delete area code
CND: display dialable calling DN for call originating within same area code but outside local calling area	10-digit DN (as received from call origin)	1 + 7-digit DN	Delete area code Add prefix of 1

Applying reverse translations in ISDN ACB

When ISDN ACB is activated, it immediately checks to determine whether the DN (copied from the OCM) is valid and whether the destination line is busy. Where the destination line is served by another switch, the check is carried out using a initial busy/idle query message. The message is sent using the TCAP application.

To supply the TCAP application with the destination DN in the required 10-digit x ed format (NPA-NXX-XXXX), ISDN ACB must reverse translate a 7-, 8-, or 11-digit dialed DN.

ISDN ACB applies reverse translations based on the length of the dialed DN (and, for some seven-digit calls, the DN10DXLA tuple in table DNREVXLA), as described in the following table.

Reverse translations based on length of dialed DN (Sheet 1 of 2)

Number of digits	Assumed format	Manipulation required
1 to 6, 9, >11	Invalid (only 7, 8, 10, and 11 are valid)	Apply long-term denial tone to line
11	P-NPA-NXX-XXXX (P = prefix, usually 1)	Send rightmost 10 digits of DN to CLASS TCAP application
10	NPA-NXX-XXXX	Send DN (unchanged) to CLASS TCAP application

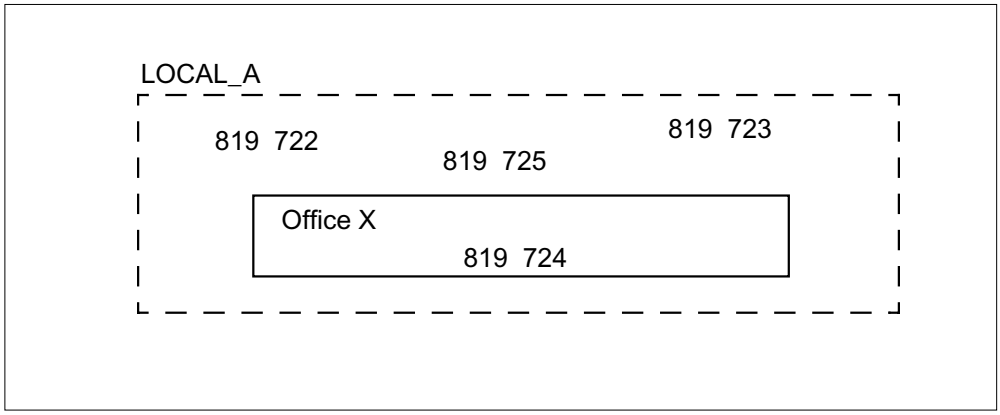
ISDN BRI Access to CLASS ACB/AR (continued)

Reverse translations based on length of dialed DN (Sheet 2 of 2)

Number of digits	Assumed format	Manipulation required
8	P-NXX-XXXX (P = prefix, usually 1)	Append rightmost 7 digits of dialed DN to NPA of ACB subscriber line to form TCAP 10-digit DN
7	NPA of destination party is ambiguous	To find NPA, check for a DN10DXLA tuple in table DNREVXLA (if a DN10DXLA tuple is not found, manipulate the digits as an 8-digit number; if a DN10DXLA tuple is found, manipulate the digits as defined in the DN10DXLA tuple)

The following gure shows the dial plan for a hypothetical of ce (or node) X. The gure illustrates the reason wh y ACB reverse translations data ll is *not* required for this hypothetical of ce X.

Public dial plan supported by of ce X



Of ce X serv es DNs in NPA 819. The DNs served by this of ce are all included in local calling area LOCAL_A.

The of ce supports the con version algorithm that conforms to the standard North American dialing plan for local and long-distance calls. The North American dialing plan offers the following:

- 7-digit dialing for local calls
- 8-digit (1 + 7-digit) dialing for toll calls in the same NPA
- 11-digit (1 + NPA-NXX-XXXX) dialing for calls to other NPAs

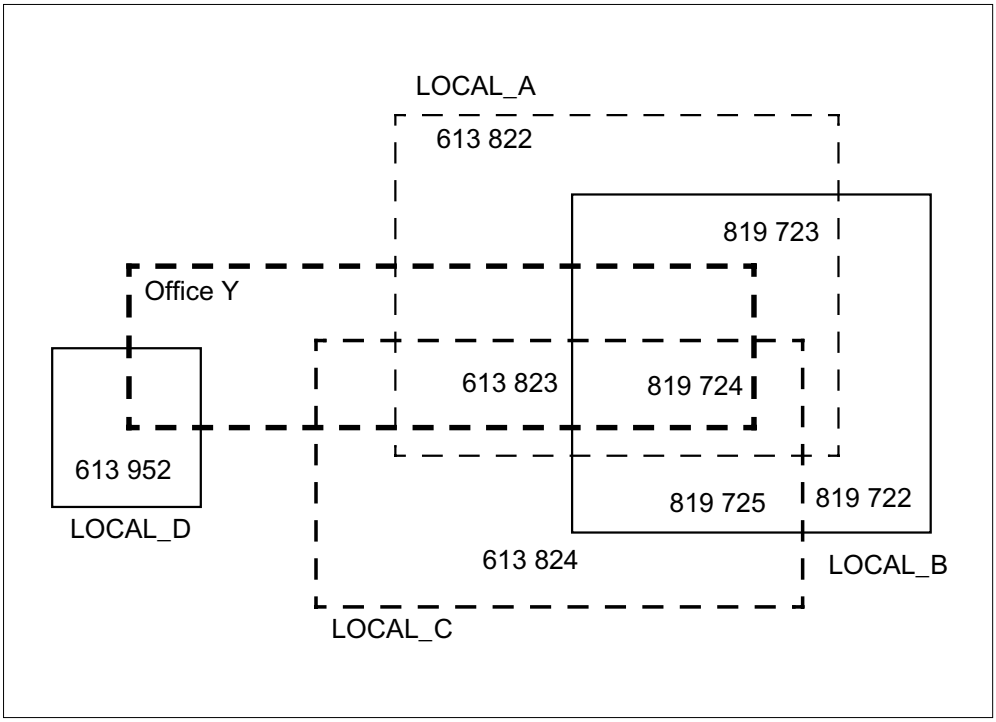
ISDN BRI Access to CLASS ACB/AR (continued)

The seven-digit dialing for ISDN ACB subscribers served by of ce X is limited to the 819 NPA. ISDN ACB can therefore reverse translate all numbers into the 10-digit form required by the CLASS TCAP application based on the number of digits in the DN.

Example scenario for ISDN ACB reverse translations data ll

The following gure shows the dial plan for of ce Y and illustrates the ISDN ACB reverse translations data ll required for a h ypothetical of ce Y .

Public dial plan supported by of ce Y



Of ce Y serves DNs in NPA 613 and NPA 819. Also, the DNs served by this of ce are included in at least one of four dif ferent local calling areas: LOCAL_A, LOCAL_B, LOCAL_C, and LOCAL_D.

The conversion algorithm supported by this of ce conforms to the standard North American dialing plan for local and long-distance calls, which offers the following:

- 7-digit dialing for local calls
- 8-digit (1 + 7-digit) dialing for toll calls in the same NPA
- 11-digit (1 + NPA-NXX-XXXX) dialing for toll calls to other NPAs

ISDN BRI Access to CLASS ACB/AR (continued)

The following detailed processing sequence shows how tables DNREVXLA and DNREGION are used to obtain the appropriate digit manipulation result for a given ISDN ACB subscriber's DN and called back DN.

Assume the ISDN ACB subscriber's DN is 823-1234 and the called back DN is 723-5678. The processing steps to obtain the result are as follows:

- The ISDN ACB subscriber's seven-digit DN is used to try to locate an appropriate DN10DXLA tuple in table DNREVXLA. In this example, the following DN10DXLA tuple is accessed because the range de ned by FROMDIGS and TODIGS includes numbers beginning with the digits 823:

  ```
  DN10DXLA 822 824( R613T613 0 613 N )( R613T819 0 819 N ) $
  ```

- Screening tests are then performed using the rst algorithm speci ed in the tuple. This algorithm speci es that the R613T613 region is to be used for DN screening.

  ```
  R613T613 822 824
  ```

  For the screening test to be successful, both the ISDN ACB subscriber's DN and the called back DN must be found in the digit ranges that de ne the given region. In this case, the ISDN ACB subscriber's DN is found in the range 822 to 824, but the called back DN is not found in region R613T613. Therefore, the screening test fails.

- Since screening for the rst algorithm f ailed, the second algorithm in the tuple is examined. This algorithm speci es the R613T819 re gion:

  ```
  R613T819 822 824 R613T819 723 725
  ```

  In this case, the ISDN ACB subscriber's DN is found in the range 822 to 824, and the called back DN is found in the range 723 to 725 of region R613T819. The screening test is therefore successful.

- The digit manipulation algorithm associated with the successful test is then applied to the called back DN. This algorithm speci es that no leading digits are to be deleted (DELDIGS = 0) and that digits 819 are to be pre x ed to the result (PRFXDIGS = 819 and OPTPRFX = N), giving the following result:

  ```
  DIGITS REQUIRED FOR TCAP: 8197235678
  ```

Alternative method for deriving the ACB TCAP DN

Subscriber Services uses an internally de ned A CB DN translator for the seven-digit translations. This translator, along with the corresponding data ll in tables DNREVXLA and DNREGION, allows conversion of a number in its dialed form to its TCAP form.

An alternative method exists for deriving the TCAP DN on seven-digit dialed DNs.

Two customer group options are provided in table CUSTHEAD (Customer Group Head): PRITCXLA and PUBTCXLA. These options determine if the existing method of extracting the TCAP DN is used, or if the alternative method is used. However, for the Subscriber Services application, only the PUBTCXLA translator is used. Option PUBTCXLA is used to specify a public network TCAP translator name for the Subscriber Services customer group. Valid TCAP translator names for option PUBTCXLA have the same format as the entries in eld RXLAN AME in table DNREVXLA.

Once de ned using option PUBTCXLA, a TCAP translator name can then be used to data ll table DNREVXLA with the customer group speci c TCAP translations. The way in which the table DNREVXLA tuple is data lled for TCAP translations depends on the value data lled in eld RXLANAME. The following paragraphs describe how tables CUSTHEAD and DNREVXLA data ll are related for the public netw ork dial plan.

Use of option PUBTCXLA in table CUSTHEAD

If option PUBTCXLA does not exist against a Subscriber Services customer group, the existing, internally de ned A CB translator name (DN10DXLA) must be used in data lling table DNREVXLA to derive TCAP numbers from seven-digit dialed numbers. These tuples are based on the calling number digits. If, however, the alternative method is used, TCAP translations is based on the called number, and option PUBTCXLA should be assigned a name other than DN10DXLA. This name would then be used in table DNREVXLA to de ne tuples for TCAP translations for se ven-digit dialed numbers whose NPA is different from the NPA of the calling line. The existing internal method of deriving TCAP numbers from 8-, 10-, and 11-digit dialed numbers is used regardless of whether option PUBTCXLA is data lled for the customer group.

The advantages of using the called number for TCAP translations rather than the calling number are as follows:

- The methods of data lling PO TS TCAP translations and MDC TCAP translations are consistent.
- Less data ll is required for table DNREVXLA. T uples are required only for the seven-digit dialed number whose NPA is different from the home NPA.
- Table DNREGION does not require data ll. The DEF AULT region is always speci ed in the table DNREVXLA tuples.

ISDN BRI Access to CLASS ACB/AR (continued)

The example shown in the following table assume that of ce Y contains lines having NPA-NXX combinations of 613-763 and 613-765. Examples of numbers dialed by a subscriber from of ce Y , and the corresponding TCAP numbers, are listed in the table.

TCAP translations of dialed numbers

Number dialed by subscriber	Corresponding TCAP number
765-XXXX	613-765-XXXX
764-XXXX	613-764-XXXX
723-XXXX	819-723-XXXX
724-XXXX	819-724-XXXX

The data ll required to translate the seven-digit number to the TCAP DN form required when option PUBTCXLA is not assigned in table CUSTHEAD is shown in the following gure. Note that table DNREGION data ll is required to identify the regions.

```
Table CUSTHEAD:

CUSTNAME CUSTXLA  DGCOLNM  IDIGCOL          OPTIONS
-------------------------------------------------------
RESGRP   RESXLA    RES      NIL
       (VACTRMT 0) (EXTNCOS 0) (FEATXLA RXCFN) $


Table DNREVXLA:

RXLANAME FROMDIGS  TODIGS                          RESULTS
-------------------------------------------------------------
DN10DXLA  764      765       (  ACBREG1    0     613     N )
                             (  ACBREG2    0     819     N ) $
     range of calling numbers

Table DNREGION:
                REGION   FROMDIGS    TODIGS
                --------------------------------
                ACBREG1       764       765
                ACBREG2       764       765
                ACBREG2       723       724
```

The data ll required to translate the se ven-digit number when option PUBTCXLA is assigned in table CUSTHEAD is shown in the following gure. Since there is only one RESTCXLA tuple, all other seven-digit called

numbers are considered to belong to the same NPA as the calling number, and the NPA is appended to the called number internally without the use of data ll.

```
Table CUSTHEAD:

CUSTNAME  CUSTXLA  DGCOLNM  IDIGCOL        OPTIONS
---------------------------------------------------------
RESGRP     RESXLA   RES      NIL
(VACTRMT 0)(EXTNCOS 0)(FEATXLA RXCFN) (PUBTCXLA RESTCXLA) $


Table DNREVXLA:

RXLANAME FROMDIGS  TODIGS                    RESULTS
---------------------------------------------------------
RESTCXLA  723      724     (  DEFAULT  0  819   N ) $

     range of called numbers
```

Applying reverse translations in ISDN AR

ISDN AR attempts to set up a call using the DN stored in the ICM. This “recalled" DN is the 10-digit number received as the calling DN for the last incoming call.

To perform call setup, ISDN AR must convert the recalled DN to its dialable form, by reverse translating the 10-digit DN into the following:

- a 7-digit DN, required to set up local calls
- an 8-digit (1 + 7-digit) DN, required to set up toll calls within the same NPA
- an 11-digit DN, required to set up calls to other NPAs

ISDN AR reverse translations uses dial plan information and conversion algorithms stored in tables DNREGION and DNREVXLA to do the following:

- determine whether a 7-, 8-, or 11-digit DN is required to set up a call
- obtain the correct digit manipulation algorithm to reverse translate the 10-digit DN
- append a pre x digit to the 10-digit DN if an 11-digit DN is required

ISDN BRI Access to CLASS ACB/AR (continued)

- delete the rst 3 digits of the 10-digit DN, and then append a pre x digit if an 8-digit DN is required
- delete the rst 3 digits of the 10-digit DN if a 7-digit DN is required

Setup of table DNREVXLA and table CUSTNTWK for ISDN AR reverse translations

The data ll setup for ISDN AR is the same as for the DDN feature. Refer to "DDN application of reverse translations" in "Dialable Number Delivery (DDN)" for details on setting up ISDN AR. Where you see the term DDN, replace it with AR. Also, the examples of ISDN AR data ll processing on the following pages use the example scenarios set up for DDN.

The following detailed processing sequence shows how tables DNREVXLA and DNREGION are used to obtain the appropriate digit manipulation result for a given set of recalled party digits and an ISDN AR subscriber's DN.

Assume the recalled DN (the calling number stored in the ICM) is 819-820-1234 and the ISDN AR subscriber's DN is 819-724-5678. The processing steps to obtain the result are as follows:

- The recalled DN is used to locate the appropriate tuple in table DNREVXLA. In this example, the following tuple is used since it includes all numbers beginning with the digits 819:

  ```
  RESRX 819 819  ( LOCAL_A  3  N  N ) ( DEFAULT 3  1  N ) $
  ```

- Screening tests are then performed using the rst algorithm speci ed in the tuple. This algorithm speci es that the LOCAL_A region is to be used for DN screening. Table DNREGION is accessed to obtain the group of DNs that comprise the LOCAL_A region.

  ```
  LOCAL_A  819722  819725
  ```

  For the screening test to be successful, both the recalled DN and the ISDN AR subscriber's DN must be found in the digit ranges that de ne the given region. In this case, the ISDN AR subscriber's DN is found in the range 819722 to 819725, but the recalled DN is not found in region LOCAL_A. Therefore, the screening test fails.

- Since screening for the rst algorithm f ailed, the second algorithm in the tuple is examined. This algorithm speci es the DEF AULT region (the DEFAULT region is a group that contains all DNs).

  The recalled DN and the ISDN AR subscriber's DN always exist in the DEFAULT region; therefore, this screening test is successful.

- The digit manipulation algorithm associated with the successful test is then applied to the recalled DN. This algorithm speci es that the leading three

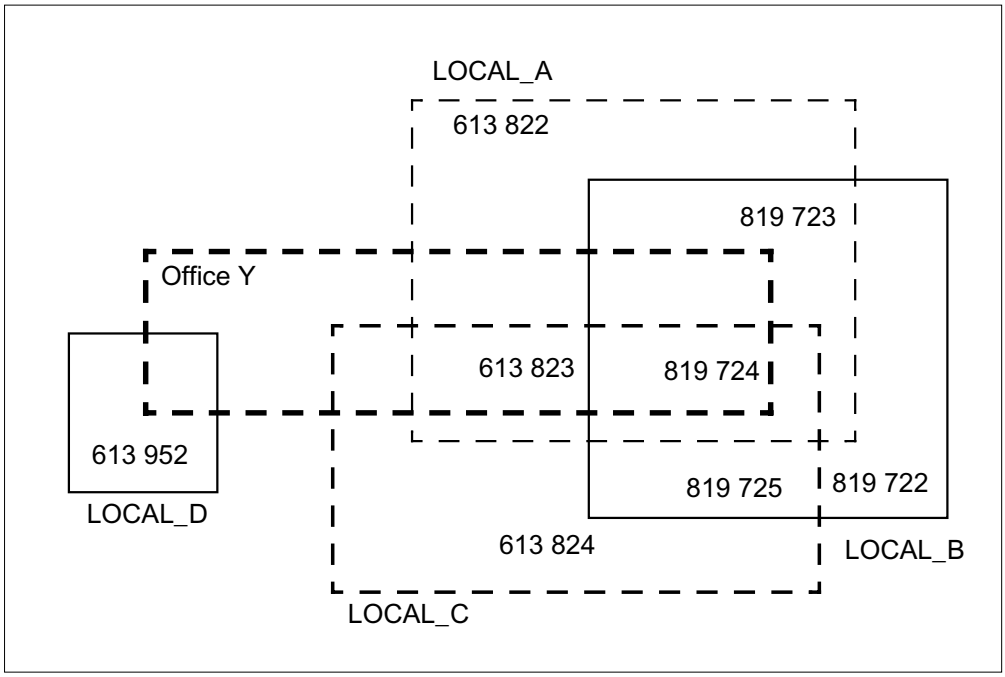
digits are to be deleted (DELDIGS = 3) and that digit 1 is to be pre x ed to the result (PRFXDIGS = 1 and OPTPRFX = N), giving the following result:

```
DIGITS REQUIRED FOR CALL COMPLETION: 18201234
```

Example scenario for ISDN AR reverse translations data ll

The following gure shows the dial plan for of ce (or node) Y and illustrates the ISDN AR reverse translations data ll required for a h ypothetical of ce Y .

Public dial plan supported by of ce Y



Of ce Y serves DNs in NPA 613 and NPA 819. Also, the DNs served by this of ce are included in at least one of four dif ferent local calling areas: LOCAL_A, LOCAL_B, LOCAL_C, and LOCAL_D.

The conversion algorithm supported by this of ce conforms to the standard North American dialing plan for local and long-distance calls, which offers the following:

- 7-digit dialing for local calls
- 8-digit (1 + 7-digit) dialing for toll calls in the same NPA
- 11-digit (1 + NPA-NXX-XXXX) dialing for calls to other NPAs

ISDN BRI Access to CLASS ACB/AR (continued)

The following table illustrates the results of recalled DN conversion (reverse translations) required for ISDN AR subscribers in of ce Y .

Note: The recalled DN is the calling DN from the last incoming call, as stored in the ICM.

Recalled DN conversions for of ce Y

Far end DN	ISDN AR subscriber	Translated recalled DN
613-823-XXXX	613-824-XXXX	823XXXX
613-822-XXXX	819-723-XXXX	822XXXX
613-822-XXXX	613-824-XXXX	1822XXXX
613-777-XXXX	613-824-XXXX	1777XXXX
613-952-XXXX	819-723-XXXX	1613952XXXX
516-444-XXXX	819-724-XXXX	1516444XXXX

ISDN AR can reverse translate most of the AR calls from of ce Y based on the NPA in the 10-digit recalled DN. The exceptions are as follows:

- recalled DNs with an NPA of 613 requiring
  - — seven digits for call completion, when the ISDN AR subscriber's DN and the recalled DN are both in local calling area LOCAL_A, or are both in local calling area LOCAL_C, or are both in local calling area LOCAL_D
  - — eight digits for call completion, where the ISDN AR subscriber's DN and the recalled DN both have an NPA of 613, but are not in the same local calling area
  - — 11 digits for call completion, where the recalled DN does not have an NPA of 613
- recalled DNs with an NPA of 819 requiring
  - — seven digits for call completion, where the ISDN AR subscriber's DN and the recalled DN are both in local calling area LOCAL_A, or are

both in local calling area LOCAL_B, or are both in local calling area LOCAL_C

— eight digits for call completion, where the ISDN AR subscriber's DN and the recalled DN both have an NPA of 819 but are not in the same local calling area

— 11 digits for call completion, where the ISDN AR subscriber's DN does not have an NPA of 819

The following detailed processing sequence shows how tables DNREVXLA and DNREGION are used to obtain the appropriate digit manipulation result for a given recalled DN and an ISDN AR subscriber's DN.

Assume the recalled DN is 613-823-1234 and the ISDN AR subscriber's DN is 819-725-5678. The processing steps to obtain the result are as follows:

- The recalled DN is used to locate the appropriate tuple in table DNREVXLA. The following tuple is used because it includes all numbers beginning with the digits 613.

```
RESRX 613  613    ( LOCAL_A  3  N  N )
                  ( LOCAL_C  3  N   N )
                  ( LOCAL_D  3  N  N )
                  ( TOLL_613  3  1  N )
                  ( DEFAULT  0  1  N ) $
```

- Screening tests are then performed using the first algorithm specified in the tuple. This algorithm specifies that the LOCAL_A region is to be used for DN screening.

```
LOCAL_A   613822  613823  LOCAL_A  819723  819724
```

For the screening test to be successful, both the recalled DN and the ISDN AR subscriber's DN must be found in the digit ranges that define the given region. In this case, the recalled DN is found in the range 613822 to 613823, but the ISDN AR subscriber's DN is not found in region LOCAL_A. Therefore, the screening test fails.

- Since screening for the first algorithm failed, the second algorithm in the tuple is examined. This algorithm specifies the LOCAL_C region.

```
LOCAL_C  613823  613824 LOCAL_C  819724  819725
```

ISDN BRI Access to CLASS ACB/AR (continued)

In this case, the recalled DN is found in the range 613823 to 613824, and the ISDN AR subscriber's DN is found in the range 819724 to 819725 of region LOCAL_C. The screening test is passed.

- The digit manipulation algorithm associated with the successful test is then applied to the recalled DN digits. This algorithm speci es that the leading three digits are to be deleted (DELDIGS = 3) and that no digits are to be pre x ed to the result (PRFXDIGS = N and OPTPRFX = N), giving the following result:

```
DIGITS REQUIRED FOR CALL COMPLETION: 8231234
```

Using REVXLVER to verify reverse translations data ll

REVXLVER (reverse translations veri cation) is a data ll veri cation utility, similar to TRAVER (translations veri cation), that simulates re verse translations from a speci ed origination to a speci ed destination. REVXLVER examines and displays translations data for reverse translations call processing. It can also display the reverse translations number result.

Reverse translations tables

Two data tables perform reverse DN translations. The rst table, DNREGION, is used to identify groups of DNs belonging to the same region (or community of interest). The second table, DNREVXLA, is used to provide reverse translations algorithms based on the various regions de ned in table DNREGION. Together, these two tables specify the manner in which destination digits are to be manipulated based on whether or not the originator and the destination share a particular region.

For each customer group containing lines using the ISDN AR feature, a tuple must exist in table CUSTNTWK (Customer Group Network). This table CUSTNTWK tuple identi es the reverse translator to be used by the ISDN AR feature and the DDN feature. For the ISDN ACB feature, the reverse translator name is always ACB.

The tables referenced by each REVXLVER subcommand are discussed in the following sections as part of the descriptions of the individual subcommands.

REVXLVER subcommands

The REVXLVER tool is divided into four subcommands:

- The AR subcommand allows the user to analyze AR reverse translations.
- The ACB subcommand allows the user to analyze ACB reverse translations.

- The DDN subcommand allows the user to analyze DDN reverse translations.

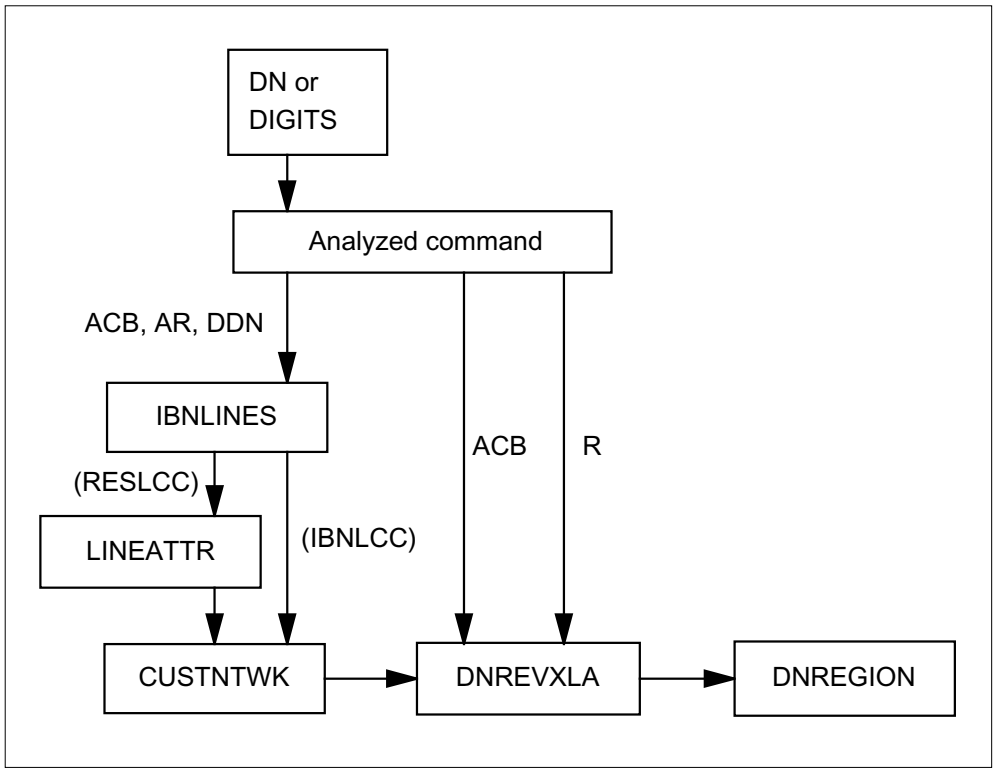
  Note: See "REVXLVER subcommands" in "Dialable Number Delivery (DDN)" for further details on the DDN subcommand.

- The R subcommand allows the user to trace data ll in table DNREGION.

Tables used by REVXLVER subcommands

The following gure sho ws how the REVXLVER subcommands (AR, ACB, DDN, and R) access the tables used by reverse translations processing.

Tables used by REVXLVER subcommands



REVXLVER AR subcommand

The following command syntax is used to activate the REVXLVER tool with the AR subcommand:

```
REVXLVER AR <DN> <DIGITS> <OPTION> <NETNAME>
```

ISDN BRI Access to CLASS ACB/AR (continued)

The components of the REVXLVER command syntax for the AR subcommand are as follows:

- DN is the 7- or 10-digit DN of the line originating the call.
- DIGITS consists of the 10-digit sequence identifying the destination.
- OPTION is the type of tracing option.
  - — The T (trace) option uses parallel software to simulate the reverse translations part of a call and displays sequentially all table entries that are referenced by the call.
  - — The NT (no trace) option displays the reverse translations output digits for the associated DN and digits speci ed in the command line.
  - — The B (both trace and no trace) option uses both options T and NT.
- NETNAME is an optional parameter identifying a valid network name. Network names are listed in table NETNAMES (Internal Logical Network Names). The default value is “PUBLIC."

AR uses the speci ed digits as though the y were stored in the ISDN AR subscriber's ICM (the digits should be a 10-digit number). These digits must be converted to their dialable form in order to perform call setup. To do this, reverse translations data ll (also kno wn as network data ll plan) is accessed.

The results of reverse translations data ll access are processed as follo ws to obtain the dialable DN:

- If reverse translations data ll indicates that 11-digit dialing should be used, AR obtains the pre x digit from table DNREVXLA and appends it to the 10-digit number.
- If reverse translations data ll indicates that 10-digit dialing should be used, AR uses the 10-digit number “as is."
- If reverse translations data ll indicates that 8-digit dialing should be used, AR obtains the pre x digit from table DNREVXLA and appends it to the rightmost 7 digits of the 10-digit number.
- If reverse translations data ll indicates that 7-digit dialing should be used, AR uses the rightmost 7 digits of the 10-digit number.

The reverse translations result for the AR subcommand is a 7-, 8-, 10-, or 11-digit number.

ISDN BRI Access to CLASS ACB/AR (continued)

Reverse translations tables used by AR subcommand The AR subcommand uses the following ve tables to convert the speci ed digits into dialable form:

- Table IBNLINES (IBN Line Assignments) uses the line equipment number (LEN) as a key to determine the line attribute index (LNATTIDX) for Subscriber Services lines or the customer group for IBN lines.
- Table LINEATTR (Line Attribute) uses the LNATTIDX as a key to determine the customer group to which the DN belongs (only for RES lines).
- Table CUSTNTWK (Customer Group Network) uses the customer group to select a reverse translator.
- Table DNREGION (DN Region) identi es the groups of DNs belonging to the same region.
- Table DNREVXLA (DN Reverse Translations) associates the reverse translator to the reverse translations algorithm based on the various regions de ned in table DNREGION. Ho wever, if there is no match between the speci ed digits and the re gions, a default result tuple can be used as an algorithm.

REVXLVER AR output examples

The following example shows the output from the AR subcommand using the T (trace) option.

ISDN BRI Access to CLASS ACB/AR (continued)

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER AR 8243000 8197251234 T
       TABLE IBNLINES
          HOST 01 0 00 01 DT STN RES 8243000 200
         ( ACB) ( AR) ( DDN)$
       TABLE LINEATTR
          200 1FR NONE NT FR01 0 613 P621 L613 TSPS 10
          NIL NILLATA 0 NIL NIL 00 Y RESG200 0 0
       TABLE CUSTNTWK
          RESG200 PUBLIC 23 (PUBLIC RESRX 10)
       TABLE DNREVXLA
          RESRX 819 819 (LOCAL_A 3 N N)
                        (LOCAL_B 3 N N)
                        (LOCAL_C 3 N N)
                        (TOLL_819 3 1 N)
                        (DEFAULT 0 1 N)
       TABLE DNREGION
          LOCAL_C 613823 613824
          LOCAL_C 819724 819725
       +++ REVXLVER: SUCCESSFUL TRACE +++
```

The following example shows the output from the AR subcommand using the NT (no trace) option.

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER AR 8243000 8197251234 NT
       DIGITS USED TO CALL 8197251234 FROM 8243000
       7251234

       +++ REVXLVER: SUCCESSFUL TRACE +++
```

The following example shows the output from the AR subcommand using the B (both trace and no trace) option.

ISDN BRI Access to CLASS ACB/AR (continued)

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER AR 8243000 8197251234 B
       TABLE IBNLINES
         HOST 01 0 00 01 DT STN RES 8243000 200
         ( ACB) ( AR) ( DDN)$
       TABLE LINEATTR
         200 1FR NONE NT FR01 0 613 P621 L613 TSPS 10
         NIL NILLATA 0 NIL NIL 00 Y RESG200 0 0
       TABLE CUSTNTWK
          RESG200 PUBLIC 23 (PUBLIC RESRX 10)
       TABLE DNREVXLA
          RESRX 819 819 (LOCAL_A 3 N N)
                        (LOCAL_B 3 N N)
                        (LOCAL_C 3 N N)
                        (TOLL_819 3 1 N)
                        (DEFAULT 0 1 N)
     TABLE DNREGION
          LOCAL_C 613823 613824
          LOCAL_C 819724 819725
       DIGITS USED TO CALL 8197251234 FROM 8243000
       7251234

       +++ REVXLVER: SUCCESSFUL TRACE +++
```

The following example shows the output from the AR subcommand using the B (both trace and no trace) option with the default digit manipulation result used.

ISDN BRI Access to CLASS ACB/AR (continued)

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER AR 8243000 8197251234 B
       TABLE IBNLINES
         HOST 01 0 00 01 DT STN RES 8243000 200
         ( ACB) ( AR) ( DDN)$
       TABLE LINEATTR
         200 1FR NONE NT FR01 0 613 P621 L613 TSPS 10
         NIL NILLATA 0 NIL NIL 00 Y RESG200 0 0
       TABLE CUSTNTWK
          RESG200 PUBLIC 23 (PUBLIC RESRX 10)
       TABLE DNREVXLA
          RESRX 819 819 (LOCAL_A 3 N N)
                        (LOCAL_B 3 N N)
                        (LOCAL_C 3 N N)
                        (TOLL_819 3 1 N)
                        (DEFAULT 0 1 N)
    TABLE DNREGION
       DEFAULT DIGIT MANIPULATION RESULT USED
       DIGITS USED TO CALL 8198261234 FROM 8243000
       18198261234

       +++ REVXLVER: SUCCESSFUL TRACE +++
```

REVXLVER ACB subcommand

The following command syntax is used to activate the REVXLVER tool with the ACB subcommand:

REVXLVER ACB <DN> <DIGITS> <OPTION>

The components of the REVXLVER command syntax for the ACB subcommand are as follows:

- DN is the 7- or 10-digit DN of the line originating the call.
- DIGITS consists of the 10-digit sequence identifying the destination.
- OPTION is the type of tracing option.
  - — The T (trace) option uses parallel software to simulate the reverse translations part of a call and displays sequentially all table entries that are referenced by the call.
  - — The NT (no trace) option displays the reverse translations output digits for the associated DN and digits speci ed in the command line.
  - — The B (both trace and no trace) option uses both options T and NT.

ACB uses the speci ed digits as though the y were stored in the ISDN ACB subscriber's OCM. The digits can be a sequence of 7, 8, 10, or 11 digits. Reverse translations is used to convert these digits to a x ed format (ten digits). ACB uses this x ed format to query the destination DN.

To do this, ACB makes the following assumptions based on the North American public network dialing plan:

- A valid public network “digits" (as dialed) can consist of 7, 8, 10, or 11 digits. Any other number of digits is deemed invalid, and the ACB call results in long-term denial.
- If “digits" consists of 11 digits, it is assumed that the digits have the form P + NPA-NXX-XXXX, where P is a pre x (the pre x must be 1 or 0; otherwise, the DN is determined to be invalid). The rightmost ten digits of the digits are used.
- If “digits" consists of ten digits, it is assumed that the digits have the form NPA-NXX-XXXX. The digits are used “as is."
- If “digits" consists of eight digits, it is assumed that the digits have the form P + NXX-XXXX. The NPA of the digits is assumed to be the same as the NPA of the originator (the ISDN ACB subscriber). The rightmost seven digits of the dialed digits are appended to the NPA to form a 10-digit DN.
- If “digits" consists of seven digits, the NPA of the destination party is ambiguous. To nd the NP A, ACB accesses reverse translations data ll. If no data ll is present for DN10DXLA, ACB assumes that the NPA of the destination party is the same as the NPA of the originator (as in the eight-digit case described previously).

The reverse translations result for the ACB subcommand is a 10-digit number.

Reverse translations tables used by ACB subcommand All ISDN ACB subscribers in the switch use the reverse translator name, ACB. Accordingly, table CUSTNTWK does not contain the ACB reverse translator name. The ACB subcommand uses the following two tables:

- Table DNREVXLA (DN Reverse Translations) associates the reverse translator to the reverse translations algorithm based on the various regions de ned in table DNREGION. Ho wever, if no match exists between the DN and the regions, no transformation of “digits" is required.
- Table DNREGION (DN Region) identi es the groups of DNs belonging to the same region.

REVXLVER ACB output examples

The following example shows the output from the ACB subcommand using the T (trace) option.

ISDN BRI Access to CLASS ACB/AR (continued)

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER ACB 6138231234 7235678 T
       TABLE DNREVXLA
          ACB 822 824 (R613T613 0 613 N)
                      (R613T819 0 819 N)
       TABLE DNREGION
          R613T819 822 824
          R613T819 722 725

       +++ REVXLVER: SUCCESSFUL TRACE +++
```

The following example shows the output from the ACB subcommand using the NT (no trace) option.

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER ACB 8231234 7235678 NT
       DESTINATION DIGITS
       8197235678

       +++ REVXLVER: SUCCESSFUL TRACE +++
```

The following example shows the output from the ACB subcommand using the B (both trace and no trace) option.

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER ACB 8231234 7235678 B
       TABLE DNREVXLA
          ACB 822 824 (R613T613 0 613 N)
                      (R613T819 0 819 N)
       TABLE DNREGION
          R613T819 822 824
          R613T819 722 725
       DESTINATION DIGITS
       8197235678

       +++ REVXLVER: SUCCESSFUL TRACE +++
```

The following example shows the output from the ACB subcommand using the B (both trace and no trace) option with the default NPA of the originator used.

ISDN BRI Access to CLASS ACB/AR (continued)

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER ACB 8231234 7235678 B
       TABLE DNREVXLA
          ACB 822 824 (R613T613 0 613 N)
                      (R613T819 0 819 N)
       TABLE DNREGION
          R613T613 822 824
          R613T613 722 725
       TABLE DNREGION
       NPA DEFAULTS TO THAT OF THE ORIGINATOR
       DESTINATION DIGITS
       6137235678

       +++ REVXLVER: SUCCESSFUL TRACE +++
```

REVXLVER R subcommand

The following command syntax is used to activate the REVXLVER tool with the R subcommand:

REVXLVER R <DN> <RXLANAME>

The components of the REVXLVER command syntax for the R subcommand are as follows:

- DN is the 7- or 10-digit DN of the line originating the call.
- RXLANAME is the name of a valid reverse translator name. The RXLANAME parameter is valid only in the R subcommand syntax.

The R subcommand uses the speci ed re verse translator name and digits to locate the table DNREVXLA logical tuple to which the digits belong. This tuple is then parsed to determine the regions in table DNREGION that are associated with this tuple. Using these regions and the digits, the R subcommand determines whether or not the digits belong to these regions. If there is a match, the R subcommand displays the matched table DNREGION logical tuple(s).

To determine a match, both of the following conditions must be met:

- The number of digits must be greater than or equal to the number of digits in elds FROMDIGS and TODIGS in the table DNREGION logical tuple.
- The speci ed digits must be included in the range de ned by FROMDIGS and TODIGS.

There are no reverse translations results for the R subcommand.

ISDN BRI Access to CLASS ACB/AR (continued)

Reverse translations tables used by R subcommand The R subcommand uses the following two tables:

- Table DNREVXLA (DN Reverse Translations) associates the reverse translator to the reverse translations results to determine the regions used in table DNREGION.
- Table DNREGION (DN Region) determines whether or not the digits match with these regions.

The following example shows the output from the R subcommand scanning table DNREGION.

REVXLVER output example for ISDN BRI Access to CLASS ACB/AR

```
>REVXLVER R 613824 POTSAR
TABLE DNREGION
 LOCAL_C 613823 613824
 TOLL_613 613 613

   ++ REVXLVER: SUCCESSFUL TRACE ++
```

Translations table o w

The ISDN BRI Access to CLASS ACB/AR translations tables are described in the following list:

- Table CUSTSTN (Customer Group Station Option) speci es the station options assigned to each customer group.
- Table IBNXLA (IBN Translation) provides the name of the feature associated with an activation code.
- Table IBNLINES (IBN Line Assignments) lists the features assigned to a LEN.
- Table RESOFC (Residential Line CLASS Of ce Data) controls the availability of individual CLASS features for an of ce. For this example, ISDN ACB is enabled.

The ISDN BRI Access to CLASS ACB/AR translation process for ISDN ACB activation is shown in the o wchart that follows. The table o w for one-level ISDN AR activation is identical, except for the activation code.

ISDN BRI Access to CLASS ACB/AR (continued)

Table o w for ISDN BRI Access to CLASS ACB/AR (ISDN ACB activation)

Table CUSTSTN
Position on tuple for the customer group and ACB feature
OPTNAME = ACB
TONES = Y or N

Note: If subfield TONES is set to Y, tones are used instead of announcements for ACB.

The subscriber goes off-hook and dials the ACB activation code or presses the ACB toggle key.

Table IBNXLA
Position on tuple using activation code
FEATURE = ACBA

Note: If the activation code is not valid, the subscriber is routed to the feature not allowed (FNAL) treatment.

Table IBNLINES
Position on tuple using LEN of subscriber
OPTLIST = ACB

Table RESOFC
Position on tuple using ACB
ENABLED = Y

Note: If ENABLED is set to N, the subscriber is routed to the FNAL treatment.

While the subscriber remains off-hook, the DMS-100 switch places a call to the last number dialed by the subscriber, using the OCM.

ISDN BRI Access to CLASS ACB/AR (continued)

The following table lists the data ll content used in the o wchart. The data ll example is for ACB, the activation code is 66, and the LEN of the subscriber is HOST 00 02 0 05.

Data ll e xample for ISDN BRI Access to CLASS ACB/AR (ISDN ACB activation)

Datafill table	Example data
CUSTSTN	RES1 ACB 3 4 Y ACBARRP N
IBNXLA	RXCFN 66 FEAT N N N ACBA
IBNLINES	HOST 00 02 0 05 0 DT STN RES 6210011 0 (ACB) (AR) $
RESOFC	ACB Y SUBSCR ACB 5 5 30 180 120 5 5 2 Y DENY DENY DENY Y $

The ISDN BRI Access to CLASS ACB/AR translation process for ISDN AR two-level activation is shown in the o wchart that follows.

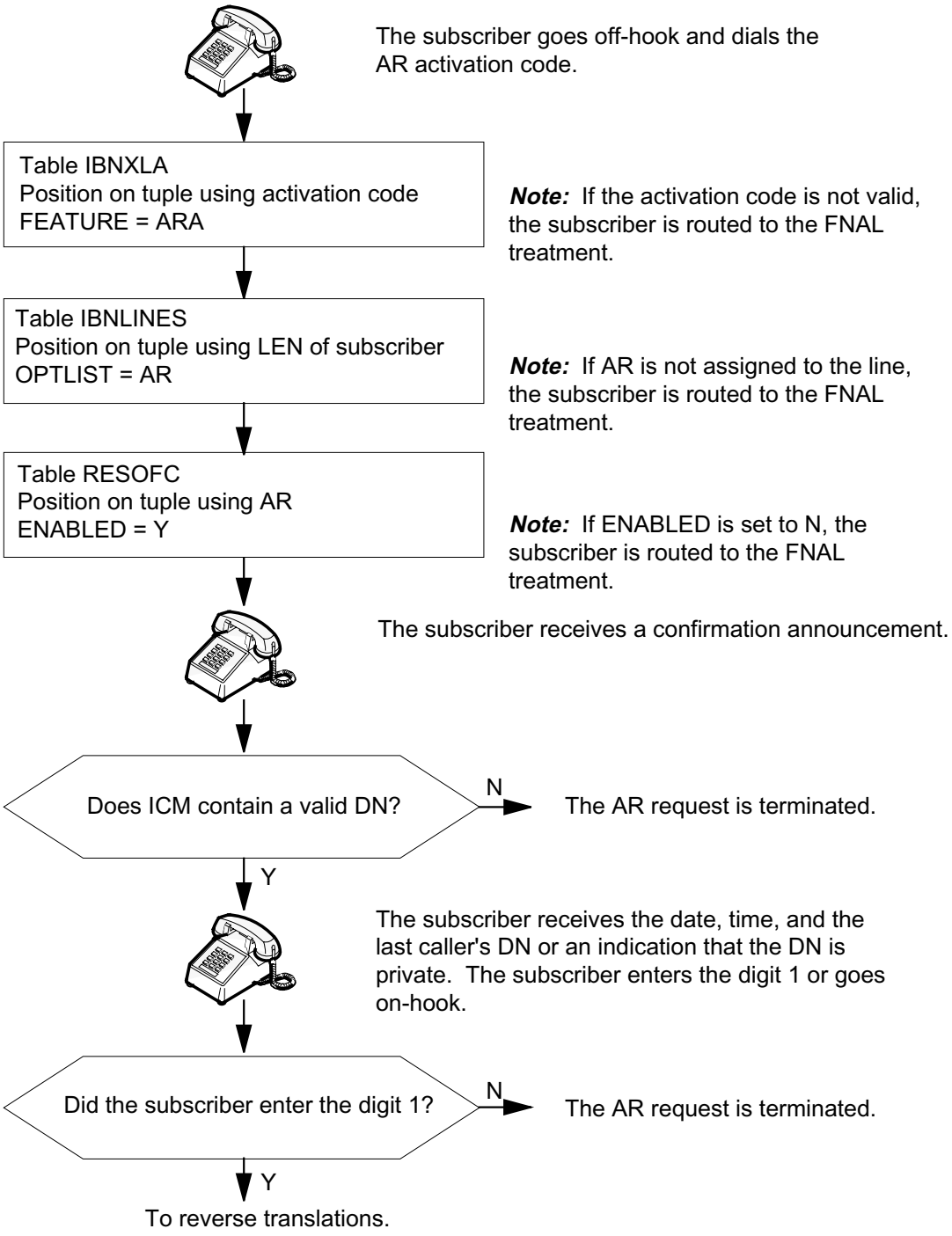
Table IBNXLA (IBN Translation) provides the name of the feature associated with an activation code.

Table IBNLINES (IBN Line Assignments) lists the features assigned to a LEN.

Table RESOFC (Residential Line CLASS Of ce Data) controls the availability of individual CLASS features for an of ce. F or this example, ISDN AR is enabled.

ISDN BRI Access to CLASS ACB/AR (continued)

Table o w for ISDN BRI Access to CLASS ACB/AR (ISDN AR two-level activation)



ISDN BRI Access to CLASS ACB/AR (continued)

The following table lists the data ll content used in the o wchart. The data ll example is for ISDN AR two-level activation. The AR activation code is 69, and the LEN of the subscriber is HOST 00 02 0 05.

Data ll e xample for ISDN BRI Access to CLASS ACB/AR (ISDN AR two-level activation)

Datafill table	Example data
IBNXLA	RXCFN 69 FEAT N N N ARA
IBNLINES	HOST 00 02 0 05 0 DT STN RES 6210011 0 (ACB) (AR) $
RESOFC	AR Y SUBSCR AR TWOLEVEL 5 5 30 180 120 5 5 2 Y DENY DENY DENY Y 2 2 $

Limitations and restrictions

The following limitations and restrictions apply to ISDN BRI Access to CLASS ACB/AR:

- ISDN ACB and AR are supported only on NI-2 terminals.
- ISDN ACB and AR do not support Universal Access.
- ISDN ACB and AR are incompatible with packet-switched data.
- ISDN ACB and AR are incompatible with the following Multiple Appearance Directory Number (MADN) variants: EXB (extension bridging) and MCA (multiple call arrangement). ISDN ACB and AR are compatible with MADN CACH (call appearance call handling) and SCA (single call arrangement).
- ISDN ACB and AR cannot be provisioned on the same line with the following options:
  - — Automatic Line (AUL)
  - — Denied Origination (DOR)
  - — Denied Termination (DTM)
  - — Ring Again (RAG)
- For the following call types, the call memory (ICM or OCM) is not updated with the DN; therefore, ISDN ACB and AR do not apply to these DNs:
  - — operator-assisted calls
  - — calls directed to an emergency number
  - — directory assistance calls
  - — 800, 888, or 900 calls

ISDN BRI Access to CLASS ACB/AR (continued)

- ISDN ACB and AR do not support Calling Name Delivery (CNAMD). That is, the calling name is not stored in call memory and is not included in the ACB or AR noti cation. When call setup occurs follo wing a successful ACB or AR request, basic call delivers the name.
- The originating line must be assigned one or both of the ISDN ACB and AR features.
- Both the originating and terminating switches must support the ISDN ACB and AR features.
- A subscriber is allowed up to 30 combined ISDN ACB or AR requests concurrently (not 30 ISDN ACB requests and 30 ISDN AR requests).
- A subscriber cannot query the status of ISDN ACB or AR requests outstanding for individual lines or block the use of a set of CLASS features.
- For interof ce ISDN A CB and AR, CCS7 links must be in operation between the originating and terminating switches:
  - — ISUP (CCS7 call setup used to forward the calling number to ISDN AR subscribers)
  - — CLASS TCAP (CCS7 application used to scan the status of busy lines)
  - — SCCP (CCS7 message routing capability used to route TCAP messages)
- The following restriction applies to the use of ISDN ACB and AR with Automatic Call Distribution (ACD) and Uniform Call Distribution (UCD) groups: in the case where ACB blocking is applied to interof ce calls, the terminating end of ce (EO) must ha ve ACB blocking enabled.

The following additional limitations and restrictions apply to the ACB/AR Scans Entire Hunt Group feature:

- The entire multiposition hunt (MPH) group for idle members is not scanned.
- Interactions between preferential hunt (PRH) group members and the stop hunt (SHU) option have no signi cant ef fect on ISDN ACB or AR scanning to determine an idle DN.
- The LOD (line over o w to DN) and LOR (line over o w to route) options are not considered when determining whether a line is available for termination. If, for example, a hunt group has option LOD and a line with ISDN ACB tries to call back the hunt group when all members are busy, the presence of the LOD option is ignored. If, after the ISDN ACB line has received and answered distinctive ringing, all members of the hunt group go busy, the LOD option is used. It is as if the ISDN ACB line phoned the

ISDN BRI Access to CLASS ACB/AR (continued)

hunt group directly; therefore, the ISDN ACB line is routed to the DN speci ed by the LOD option.

- When ISDN ACB or AR involves scanning of hunt groups that contain members with the Anonymous Caller Rejection (ACRJ) feature, ACRJ is not considered in determining an idle DN. Upon call setup to the ISDN ACB or AR DN, incompatibility checks are performed, and the call is denied if the DN is in the ACRJ list.

Interactions

The following paragraphs describe the interactions between ISDN BRI Access to CLASS ACB/AR and other functionalities.

Additional Call Offering

When the calling party DN attempts to activate ISDN ACB or AR to a called party DN with Additional Call Offering, the following two possibilities exist:

- If the called party is “call reference busy," the call cannot be offered.
- If the called party is no longer “noti cation b usy," the call can be offered through Additional Call Offering.

Note: The term “call reference busy" means that all the call references established through a SETUP message that are allowed to be in use by an ISDN DN/call type (DN/CT) pair, are currently in use. The term “noti cation b usy" means that all the call references that can be used concurrently for user noti cation of waiting calls for a given ISDN DN/CT pair are currently in use.

Anonymous Caller Rejection

When the called party's DN has ACRJ active, and an attempt is made to activate ISDN ACB or AR to a called party's DN that is marked as anonymous, the ACB or AR request is activated (assuming the called party is busy) instead of going to ACRJ treatment.

If the calling party DN has an anonymous DN presentation status and attempts ISDN ACB or AR to a called party DN with ACRJ, the attempt is rejected with long-term denial treatment.

Attendant console

When ISDN ACB or AR attempts to terminate on an attendant console DN, the terminating switch indicates idle if the attendant console or attendant console subgroup (depending on the DN) is in service. For intraof ce ISDN A CB or AR, the direct query of the console DN also indicates idle. This causes the originating of ce to attempt a call setup to that number .

If the attendant console or attendant console subgroup is not in service, ISDN ACB or AR attempts to the attendant console result in a long-term denial announcement.

The calling party can activate ISDN ACB or AR on a station that is busy as a result of talking to an attendant console.

Caller Identity Delivery on Call Waiting

When an ISDN ACB or AR request is activated toward a called party that has Calling Identity Delivery on Call Waiting (CIDCW), the busy/idle status is determined as follows. If the called party's line is idle, or the called party's line is busy but can be waited, the DN is determined to be idle. If the called party's line is busy and the call cannot be waited, the DN is determined to be busy.

Call Forwarding

When ISDN ACB or AR attempts to terminate on a station that has Call Forwarding Variable activated, the ISDN ACB or AR subscriber receives a short-term denial announcement.

ACB or AR recall ringing to the ISDN ACB or AR subscriber line is not affected by any type of call forwarding that the subscriber may have activated (that is, the ACB or AR recall ringing does not follow the call forwarding feature).

Note: Call Forwarding Variable is a Bellcore generic name for IBN line options Call Forward Universal (CFU), Call Forward Intergroup (CFI), and Call Forward Fixed (CFF).

Call Forwarding Busy

ISDN ACB or AR attempts to busy a called party DN with the Call Forwarding Busy (CFB) feature when the called party DN is busy are denied. If the called party DN has the CFB feature and the called party is idle, immediate processing is performed and the call is connected.

If the called party becomes busy during call setup, the ISDN ACB or AR attempt follows the call forward busy to another DN.

Call Forwarding Don't Answer

When ISDN ACB or AR attempts to terminate on a station with Call Forwarding Don't Answer (CFDA) active, the call setup attempt is not affected by CFDA processing.

If the calling party has CFDA and does not answer, the CFDA chain is not followed. Instead scanning is triggered.

ISDN BRI Access to CLASS ACB/AR (continued)

If the calling party has CFDA, the noti cation is not forw arded.

Call Forwarding Remote Access

The calling party cannot activate ISDN ACB to a Call Forwarding Remote Access (CFRA) Direct Inward Service Access (DISA) DN. ISDN ACB attempts to a CFRA DISA DN result in NACK treatment.

Calling Identity Delivery and Suppression

If the ISDN ACB or AR calling party's DN is public and the line does not have Calling Identity Delivery and Suppression (CIDS), the DN is delivered. If the line has CIDS, the DN is delivered if the suppression code is not dialed prior to the ISDN ACB or AR activation. The DN is not delivered on the subsequent call setup if the CIDS code is dialed prior to ISDN ACB or AR.

If the ISDN ACB or AR calling party's DN is private and the line does not have CIDS, the DN is not delivered. If the ISDN ACB or AR calling party's DN is private and the line has CIDS, the private indicator is delivered to the called party DN. If the delivery code is dialed prior to activating ISDN ACB or AR, the DN is delivered.

Calling Number Delivery and Calling Number Delivery Blocking

When ISDN ACB is used with the Calling Number Delivery (CND) feature, the called party DN is displayed along with the messages “Monitoring on" and “Place call now". The DN is also displayed along with the message “Monitoring off".

When ISDN AR is used with the CND feature, the called party DN is displayed along with the messages “Monitoring on", “Place call now", and “Monitoring off". The DN is also displayed for two-level activation with the message “Dial 1 to recall".

The DN is only displayed if the private indicator is not set and the incoming suppression bit is not set (called party DN).

When the ISDN ACB or AR calling party DN is public and the line does not have Calling Number Delivery Blocking (CNDB) or the CNDB access code is not activated prior to the call), the number is always delivered.

When the ISDN ACB or AR calling party DN is private and the line does not have CNDB, the DN is not delivered. When the ISDN ACB or AR calling party DN is private and the line has CNDB, the private indicator is delivered to the called party DN.

For ISDN ACB activation, if the CNDB access code is dialed prior to placing the call, the private indicator is set and stored in the OCM. Even though CNDB does not apply to subsequent calls, ISDN ACB activation uses the information in the OCM and DN delivery is blocked.

Call Pickup and Directed Call Pickup

Once ISDN ACB or AR has rung the destination station, the Call Pickup (CPU) or Directed CPU (DCPU) features can be activated.

ACB or AR special ringing to the ISDN ACB or AR subscriber is not affected by the CPU or DCPU features.

ISDN AR cannot be used to reestablish a call that has been answered using CPU or DCPU. The ICM is not updated when a call is picked up by an ISDN AR subscriber.

Call Waiting

ISDN ACB or AR considers a called line to be idle if the line is idle in call processing or if the call is call waitable. The call is call waitable if it adheres to the normal restrictions for Call Waiting (CWT). The following restrictions apply:

- The called line must have CWT.
- For MDC and RES lines, the called line must also have Call Waiting Intragroup (CWI).
- Originating call waiting features Call Waiting Originating (CWO) and Call Waiting Denied (CWD) do not apply.

The reason for these restrictions is that the intragroup status of a call cannot be determined when an initial query arrives over TCAP. At this point, the characteristics of the originating line cannot be determined. Therefore, any CWT interactions that depend on the call being intragroup will return a busy status.

These CWT scenarios apply only to ISDN ACB or AR calls involving immediate processing. CWT interactions involving ISDN ACB or AR delayed processing function as if CWT is not assigned.

Note: Call Waiting is not supported on ISDN sets.

Coin lines

The ISDN ACB or AR subscriber can activate ACB or AR to a coin line if the entry for sub eld FEATNAME is ACB or AR and option COINLINE is set to

ISDN BRI Access to CLASS ACB/AR (continued)

ACCEPT in table RESOFC. If option COINLINE is set to DENY, attempts to use ISDN ACB on a coin line result a long-term denial announcement.

Customized Code Restriction

ISDN ACB or AR and Customized Code Restriction (CCR) can be assigned to the same DN.

When a calling party with CCR attempts AR to a DN that is not permitted to be dialed from the calling party's DN, the attempt is denied and results in long-term denial treatment.

When an ISDN ACB or AR request is activated toward a called party that has CCR active, there are no interactions.

Denied Termination

When ISDN ACB or AR attempts to terminate on a line that has Denied Termination (DTM), the ISDN ACB or AR subscriber receives a long-term denial announcement.

Distinctive Ringing/Call Waiting

There are no interactions when an ISDN ACB or AR attempt is made toward a called party DN with Distinctive Ringing/Call Waiting (DRCW) active. However, when call setup is attempted to an idle called DN with DRCW, basic call applies and the DRCW terminating treatment may be applied.

Flexible Calling

ISDN ACB or AR can be activated or deactivated from the second leg of a e xible call.

ISDN ACB or AR recall noti cation is not pro vided until the calling party is completely idle.

The calling party can activate ISDN ACB or AR against another station involved in a e xible call.

Hunt groups

A member of a hunt group can be an ISDN ACB or AR subscriber. Special recall ringing is only given to the ISDN ACB or AR subscriber (that is, hunting does not apply).

The ACB/AR Scans Entire Hunt Group feature (NC0314) allows ISDN ACB or AR feature activations to work with multiline hunt (MLH) groups, distributed line hunt (DLH) groups, and directory number hunt (DNH) groups.

ISDN BRI Access to CLASS ACB/AR (continued)

MLH groups

In an MLH group, each member has the same DN but different LENs. When this DN is dialed, hunting starts with the pilot LEN and continues to the end of the group, where the hunt is complete. The calling station is connected to the rst idle line that is found.

DLH groups

In a DLH group, each member has the same DN but different LENs. When this DN is dialed, hunting starts with the LEN following the last idle LEN. A LEN must be idle to receive a call. If it is not idle, the call rolls to the next available LEN.

For DLH groups, hunting can start with any member. Hunting continues through the rest of the group and stops once an idle line is found.

DNH groups

In a DNH group, each member in the group has its own DN. Hunting begins with the number dialed and continues until the end of the group is reached. If the group has the CIR (circular hunting) option, hunting begins with the number dialed, continues through the rest of the group, and then rolls to the top until an idle line is found.

Implementing ISDN ACB and AR with hunt groups

With the implementation of ISDN ACB or AR with hunt groups, the originating switch sends a message to the terminating switch requesting that terminating scanning be performed. Terminating scanning requires the terminating switch to monitor the status of the ISDN ACB or AR line and to notify the originating switch when the line is available. If there is an idle member of the hunt group (that ts in with the hunting scheme of the group) during this initial query stage, neither originating nor terminating scanning is required, since the call can immediately complete to this idle member.

If a subscriber tries to use ISDN ACB or AR to phone a line in a hunt group and all the lines in the group are busy, the subscriber receives an announcement stating that the number is busy and that the subscriber will be noti ed with ringback when the number is free. The subscriber then hangs up. The originating switch sends a message to the terminating switch requesting that terminating scanning be performed. The terminating switch refuses by returning an error message of “task refused."

When the originating of ce receives the reply of “task refused," the originating switch begins originating scanning of the hunt group. Originating scanning involves sending queries to the terminating switch inquiring about the status of the ISDN ACB or AR line.

ISDN BRI Access to CLASS ACB/AR (continued)

Once a member of the hunt group is idle, the ISDN ACB or AR subscriber receives distinctive ringing. If the subscriber answers distinctive ringing and a member of the hunt group is still idle, the idle member of the hunt group begins to ring. The ISDN ACB or AR request is now considered complete. If, when the subscriber answers distinctive ringing, the nal b usy/idle query indicates there is now no idle member, the subscriber receives an announcement stating that monitoring of the line continues.

ISDN Hold

If the calling party DN is on hold, the second call appearance can be used to activate ISDN ACB or AR.

If the calling party DN activates ISDN ACB or AR to a called party DN that is on hold and this makes the line “network determined busy," the called party DN is considered busy and scanning is applied. Otherwise, call noti cation occurs.

Note: If a POTS line is on hold, it is considered “network determined busy" (the call cannot be presented to the subscriber). If an ISDN terminal is on hold, one of the B-channels and call references is used and the line may not be considered “network determined busy" because additional call references may be available to inform the subscriber of the ISDN ACB or AR noti cation.

Make Set Busy and Do Not Disturb

If the called party has Make Set Busy (MSB) or Do Not Disturb (DND) active and the calling party attempts ISDN ACB or AR against the called party, the terminating switch disallows ISDN ACB or AR activation (for internode ISDN ACB or AR, a reply to the initial query message with a response that contains a return error component with an error code of “not queued" is sent). The calling party is given long-term denial treatment in any of these cases.

If the calling party has MSB or DND active, the ISDN ACB or AR recall is not blocked (that is, the calling party is still recalled and can answer the recall and recall the called party as usual).

If MSB or DND becomes active on a called party after an ISDN ACB or AR request is queued on the user, the party then appears busy to the ACB or AR queuing system.

If the called party deactivates MSB while the party is being scanned by ISDN ACB or AR, ACB or AR requests queued on this party are not noti ed of the event until the next time the called party goes on-hook, or timer T7 on the rst ACB or AR entry expires.

If DND is deactivated on the called party (for some reason), and the rst ISDN ACB or AR request queued on the user is performing terminating scanning, no ACB or AR request is noti ed of the DND deacti vation and the ACB or AR requests queued on this party are not noti ed of the e vent until the next time the called party goes on-hook or timer T7 on the rst ACB or AR entry expires.

Multiparty lines

ISDN ACB or AR can terminate on a two-party at rate (2FR) line with Automatic Number Identi cation (ANI). When ISDN ACB or AR attempts to terminate on a 2FR operator number identi cation (ONI), four-party at rate (4FR), eight-party at rate (8FR), or ten-party at rate (10FR) line, the subscriber receives a long-term denial announcement.

Multiple Appearance Directory Number

A calling party can activate ISDN ACB or AR against a MADN group (Multiple Call Arrangement (MCA), Extension Bridging (EXB), Single Call Arrangement (SCA) and Call Appearance Call Handling (CACH)) in the same manner as normal lines. A MADN MCA group is considered busy if all members of the group are busy, and a MADN SCA, EXB, or CACH group is considered busy when any member of the group is busy.

If an ISDN ACB or AR request is pending for a MADN MCA group (called party), the request is served when any member of the group becomes idle. If an ISDN ACB or AR request is pending for a MADN SCA group, the request is served when all members of the group are idle.

There are four variants of MADN on the DMS-100 switch. ISDN ACB and AR support on a MADN DN is as follows:

- MADN MCA does not support call memory. ISDN ACB and AR require call memory and are therefore not supported on this variant.
- MADN EXB is a RES variant of MADN SCA. ISDN ACB and AR are not supported on this variant.
- For MADN SCA, ISDN ACB and AR activation is currently supported on all members. Note that the total number of ACB and AR activations across the group is limited to the maximum number of ACB and AR activations for each DN.
- Both primary and secondary MADN CACH DNs support ISDN ACB and AR for originations and terminations.

Private Branch Exchange

ISDN ACB and AR cannot be provisioned on a PBX line or PBX trunk.

ISDN ACB and AR can be activated toward a PBX line.

ISDN BRI Access to CLASS ACB/AR (continued)

Selective Call Acceptance

A calling party that has Selective Call Acceptance (SCA) cannot activate ISDN AR to a DN that is not on the SCA list because the call has not been accepted and stored in the ICM. ISDN ACB or AR attempts to a called party with SCA are denied if the DN associated with the request is not on the SCA list.

Selective Call Forwarding

When an ISDN ACB or AR activation is made to a called party DN that is in a Selective Call Forwarding (SCF) screening list, the call attempt is not forwarded to the remote DN. However, upon successful call setup, the call is forwarded to the remote DN.

Selective Call Rejection

If the ISDN ACB or AR party's DN is in the party's Selective Call Rejection (SCRJ) list, the terminating switch responds to the line feature query by setting the SCR bit. The originating switch recognizes this and sets up the call for the calling party to hear the SCR announcement from the terminating switch. This is done even if the called party is busy.

Speed Calling

ISDN ACB can be activated if the previous call was set up using the Speed Calling feature.

Teen Service

The calling party can activate ISDN ACB or AR to a Teen Service primary DN (PDN) or secondary DN (SDN).

Teen Service is not compatible with ISDN terminals; therefore, ISDN ACB and AR cannot be provisioned against a Teen Service DN.

Uniform Call Distribution and Automatic Call Distribution

If the called number is provisioned as an Automatic Call Distribution (ACD) or Uniform Call Distribution (UCD) DN, ISDN ACB does not monitor the called station, since it considers the destination as being idle and immediately routes the caller to the called DN.

When the destination DN is associated with an ACD or UCD group, ISDN ACB can be blocked through use of of ce parameter ACB_BLOCKED_FOR_ACD_UCD in table OFCENG (Of ce Engineering). The blocking of ISDN ACB for ACD and UCD groups applies to intraof ce and interof ce calls. F or interof ce calls, the terminating EO must ha ve the blocking of ISDN ACB to ACD and UCD groups enabled.

Other special conditions

If the ISDN ACB or AR destination party is maintenance busy, system busy, deloaded, or locked out, or has the SUS (suspended service), PLP (plug-up (trouble intercept)), or RSUS (requested suspension) option assigned, the ISDN ACB or AR subscriber receives a long-term denial announcement.

If the called party is taken out of service while ISDN ACB or AR termination scanning is in operation, the party continues to look busy to ISDN ACB or AR.

If the called party is then returned to service, no ISDN ACB or AR request is noti ed of the line's return to service until either the next time the called party goes on-hook, or until timer T7 on the rst ISDN A CB or AR entry expires.

Activation/deactivation by the end user

The subscriber can activate ISDN ACB or AR using either the one-level activation procedure or the two-level activation procedure.

ISDN ACB can also be activated and deactivated using the ACB toggle key. For more information, see “Feature key management."

The following table lists the messages displayed on an ISDN terminal as a result of various ISDN ACB or AR activation and deactivation conditions.

Displayed messages for ISDN ACB and AR

Message	Condition
“Place call now"	ISDN ACB or AR notification of idle end user
“Request denied"	ISDN ACB or AR request denied activation
“Monitoring on"	ISDN ACB or AR activation
“Monitoring off"	ISDN ACB or AR deactivation
“Press 1 to place call"	Two-level ISDN AR activation

One-level feature activation

The subscriber can activate ISDN ACB or AR at any time (upon going off-hook and receiving dial tone) by dialing the appropriate activation code. The code should be in the format *XX and can be changed by the operating company for an individual of ce. The recommended acti vation codes for ISDN ACB and AR are *66 and *69, respectively.

Note: Flash activation of ISDN ACB and AR is not allowed.

ISDN BRI Access to CLASS ACB/AR (continued)

Once the activation code is entered, the system responds by checking the subscriber line to ensure that ISDN ACB or AR is assigned to that line. If the feature is not allowed, an FNAL treatment or FNAL announcement (if data lled) is returned, and the ISDN terminal displays “Request denied".

The ISDN ACB or AR request is refused under any of the following conditions:

- The called line has call forward variable active, POTS call forwarding feature, or the MDC call forwarding features CFU, CFI, or CFF.
- The called line has Selective Call Forwarding (SCF) active for the calling party.
- The called line terminating restriction indicator is not equal to “unrestricted termination."
- The service type and DN match indicators of the called line (parameters received by the originating of ce in response to the initial query) are unacceptable. Some service type/DN match combinations are de nable as accept or deny, by the operating company.

Feature key management

Feature key management procedures refer to the use of feature keys on an ISDN terminal to activate and deactivate the ISDN ACB feature. ISDN BRI Access to CLASS ACB/AR implements the toggle key method of activation and deactivation for ISDN ACB. Toggle key operation refers to the use of one key to handle both activation and deactivation of ISDN ACB.

The operation of the ISDN ACB toggle key is designed to resemble the existing ACB key feature for Meridian business sets (MBS) as closely as possible. In general, the toggle key activates an ISDN ACB request if there are none currently active and deactivates all ISDN ACB requests if there are any ISDN ACB requests outstanding against any DN on the terminal.

The ISDN ACB toggle key is assignable only once for each ISDN terminal.

Note: The use of toggle key activation and deactivation is available only for the ISDN ACB feature. The ISDN AR feature uses activation codes in the same manner as is used for AR on MBSs.

Two-level feature activation

In addition to one-level activation, ISDN AR can also be activated using a two-level procedure. Two-level activation does not apply to ISDN ACB.

The system checks the line that is requesting access to ISDN AR to determine if access is allowed. If access is not allowed, a denial announcement is given,

and the ISDN terminal displays “Request denied". The line is idled without delay upon completion of the denial announcement. If access is allowed, an announcement informs the subscriber that ISDN AR has been accessed. If the number in the ICM is valid, the DN of the last incoming call is announced to the subscriber. With two-level activation, the date and time of the last incoming call can also be provided. Voiceback includes the date, the time, and the calling DN. If the DN in the ICM is designated as private, a private number indication is announced to the subscriber.

In both cases, the subscriber is instructed to dial 1 to activate ISDN AR or to hang up to abort the ISDN AR request. If the number in the ICM is invalid (an out-of-area or DN unavailable indicator or only a partial DN exists in the calling number portion), the subscriber is informed that ISDN AR cannot be activated for the most recent incoming call. After this announcement, the line is idled without delay. If the number is valid and the subscriber dials 1 to activate the feature, the two-level activation procedure is complete. The system then attempts to call the DN associated with the most recent incoming call.

Note: Flash activation of ISDN AR is not allowed.

DN voiceback on ISDN AR two-level activation

With two-level ISDN AR activation, the subscriber hears the DN and (optionally) the date and time of the last call, in the form of an interruptible announcement. The announcement is interruptible because the subscriber can dial 1 or hang up at any time after the start of the announcement. The recommended wording of this announcement is as follows: “The last number that called your line was <DN>. This call was received on <date> at <time>. To call this number, enter “1". Otherwise, hang up now."

This announcement, DNANN, is a customized announcement requiring data ll in tables ANNS, ANNMEMS, and DRMUSERS.

The phrase ENGVARDNF is used by features requiring English DN voiceback to voice a DN. The phrase CLASSENG17 completes the announcement. This phrase reads as follows: “To call this number, enter “1". Otherwise, hang up now."

Invalid DN announcement on ISDN AR two-level activation

An announcement is provided on two-level ISDN AR activations where the ICM is empty or contains an invalid DN. This invalid DN announcement, referred to as INVANN, is also a customized announcement, and reads as follows: “We're sorry, the last number that called your line is not known. This call was received on <date> at <time>. Please hang up now."

ISDN BRI Access to CLASS ACB/AR (continued)

Feature processing

When the ISDN ACB or AR feature is successfully activated, system processing begins.

Note 1: If the reply to the initial query indicates that immediate processing is to be used, the ISDN ACB or AR request is considered complete, and call setup is attempted. If call setup fails, the ISDN terminal displays “Request denied". The subscriber hears the appropriate call-failure treatment and can try the ISDN ACB or AR activation procedure again.

Note 2: In responding to the initial query, the DMS-100 switch does not include the optional DN-to-line service type mapping parameter if the requested parameter values cannot be returned and an error component with a “data unavailable" error code is sent.

Note 3: The DMS-100 switch always performs a nal b usy/idle query on answer of recall ring before subsequent call setup. If the reply to the busy/idle query is IDLE, the ISDN ACB or AR request is considered complete, and call setup is attempted. A failure in call setup results in the normal call-failure treatment. If the reply to the query is BUSY, the system continues to poll the destination line until it returns to an idle state.

If the request is intranodal, feedback to the subscriber is immediate. If the request is internodal, the subscriber hears nothing until a reply to the initial TCAP query is received or until timer T5 expires. (Timer T5 speci es the number of seconds the originating switch waits for a response from the terminating switch.) The following table lists the possible ISDN ACB or AR processing replies heard by the subscriber.

Processing replies for ISDN ACB and AR (Sheet 1 of 3)

Reply	Description
Audible ring	Audible ring indicates the call is being completed immediately. Even if the called party does not answer, the ISDN ACB or AR request is considered complete.
Announcement indicating the line is busy	If the called line is busy and the ISDN ACB or AR request is accepted, a confirmation announcement (CONFANN) such as the following is given: “The line is busy. You will be notified by special ringing when the line is free. Please hang up now."

ISDN BRI Access to CLASS ACB/AR (continued)

Processing replies for ISDN ACB and AR (Sheet 2 of 3)

Reply	Description
Standard DMS failure treatments	These treatments indicate the ISDN ACB or AR request cannot be processed for some reason other than those covered by STDENIAL and LTDENIAL announcements. The DMS failure treatments used by ISDN ACB and AR are as follows: • feature not allowed (FNAL) • negative acknowledgment (NACK) • network blockage heavy traffic (NBLH) • no software resource (NOSR) • no service circuit (NOSC) • system failure (SYFL)
STDENIAL	This announcement indicates the ISDN ACB or AR request cannot be processed at the present time because the called line has call forward variable, or the DMS-equivalent CFU, CFI, CFF, call forwarding, or SCF activated for the calling party. Refer to “Appendix D Quick reference for switch timers, announcements, and treatments for ACB/AR" for a complete list of short-term denial announcements.

ISDN BRI Access to CLASS ACB/AR (continued)

Processing replies for ISDN ACB and AR (Sheet 3 of 3)

Reply	Description
LTDENIAL	A long-term denial of the ISDN ACB or AR request results from any of the following conditions: • The call is interoffice and end-to-end CCS7 connectivity does not exist. • The called line status cannot be determined by the terminating office (for example, the line is part of a private branch exchange [PBX]). • The called party has a class of service other than “unrestricted termination" or “selective call rejection." • Network choking is in effect for the called DN. • The service type and DN match indicators of the called line are unacceptable (acceptability of some values can be datafilled). • The call is inter-LATA or international. • The ISDN ACB or AR request is made to an 800 or 900 number. • The DN to which the request is made is invalid (based on the North American public network dialing plan).
SCRJ announcement	If the called party has included the subscriber in an SCRJ table, the terminating switch includes an SCRJ indication in the response. When the originating switch encounters an SCRJ indication, a call is immediately set up, regardless of the called party's busy/idle status, so that the calling party can hear the correct announcement from the terminating switch.

Immediate processing

If the reply to the initial query message indicates the called party is idle, and the restriction checking is successful, the ISDN ACB or AR call setup is attempted.

The call continues as if the subscriber had manually dialed the called DN. The ISDN ACB or AR request is treated as complete even if the call setup fails.

ISDN BRI Access to CLASS ACB/AR (continued)

Delayed processing

If the called party is busy, delayed processing is activated. The originating switch starts the duration timer for the current request, and the ISDN terminal displays “Monitoring on".

For interof ce ISDN ACB or AR, if the terminating switch has not queued the initial query message request, or if option TERMSCAN is set to N in table RESOFC, the originating switch performs originating scanning by periodically sending busy/idle TCAP queries to the terminating switch at a rate data lled as TSCAN. The maximum time between these busy/idle queries is determined by timer T11 in the terminating switch. If the ISDN ACB or AR request is activated and the terminating switch has queued the request, the originating switch sends a request for the terminating switch to perform terminating scanning. The terminating switch either accepts the request and starts monitoring the called party (to detect a “called party going idle" event), or rejects the request, forcing the originating switch to perform originating scanning. As with the initial query message, timer T5 is started to ensure that a response arrives within a reasonable amount of time. If timer T5 expires, the originating switch assumes terminating scanning cannot be done and performs originating scanning.

For intraof ce ISDN A CB or AR, terminating scanning is always performed.

If terminating scanning is activated, the terminating switch starts timer T7. This timer determines the duration of this request in the terminating switch. Timer T7 is set as the minimum of

- the remaining value of timer T10 (the duration in minutes that the call stays in queue on both the originating and terminating switches) on the terminating switch
- 1 + the integer number of minutes in the value of timer T6 (the duration timer for ISDN ACB or AR on the originating switch) passed in the terminating scanning request message

Once the ISDN ACB or AR service has been activated, originating or terminating scanning continues until one of the timers expires, the called party is found idle, or the request is manually deactivated by the originator.

Recall and call setup

When the originating of ce has recei ved a message indicating the called line is idle, the status of the calling line is checked to determine whether the call can be set up.

ISDN BRI Access to CLASS ACB/AR (continued)

If the calling party's line is busy when the response indicating that the called party is free is received, the originating switch waits for the calling party's line to become idle, then resumes scanning of the called party's status.

For interof ce ISDN A CB or AR to perform terminating scanning, a TCAP message with the duration parameter set to the remaining value of timer T6 is sent to resume the operation. This causes an updating of timer T7.

For originating scanning, the switch resumes sending queries.

When both the calling and called parties are free, special recall ringing is given to the calling party.

If the calling party answers the recall, the originating switch performs a nal busy/idle query of the called party. For interof ce ISDN ACB or AR, a TCAP message is sent to initiate this query. If the called party is still idle, the switch sets up the call to the called party again, using the digits dialed on the original call (for ACB or AR), and the service is terminated (using a TCAP message in the case of interof ce ISDN A CB or AR). This results in an updating of the OCM.

If the reply to the nal busy/idle query indicates the called party has once again gone busy, the scanning resumes, and a special announcement (BUSYANN) is given to the calling party.

> ***Note:*** There is no restriction on the facilities used for the nal call setup. Call setup can be performed using either per-trunk signaling or CCS7-type trunks. If the called party is busy or all trunks are busy, or any other call setup failure occurs after the call is set up, the calling party hears the corresponding treatment and must repeat activation.

If the calling party does not answer the special ringback before the maximum number of ring cycles (RINGCYCL), the system starts timer T2. (Timer T2 waits a speci ed number of minutes between unanswered special ringing and reinitiation of service.) When timer T2 expires, and if the value of timer T6 (the duration timer) is greater than N (a data llable time constant), the system resumes scanning of the called party. If the called party is still free, the calling party is given special ringing once again. The duration of time between the recall attempts (timer T2) and the maximum number of ringback attempts (RINGAPPL) are data lled in table RESOFC by the operating company. If the value of timer T6 is less than N or the maximum number of recall attempts has been reached, the service is terminated.

If the calling party goes on-hook before a reply to the query is received or the time allowed by the originating switch to receive a response from the

terminating switch (timer T5) expires, the ISDN ACB or AR request is canceled.

System deactivation

An ISDN ACB or AR request is automatically deactivated under any of the following conditions:

- Special ringing has been given to the calling party, the ringing is answered, and the reply to the nal busy/idle query is IDLE, resulting in a call setup attempt.
- Timer T6 expires at the originating of ce. This may result in a TCAP message being sent to the terminating of ce (for interof ce ISDN ACB or AR). For intraof ce ISDN ACB or AR, the request is deactivated directly.
- Timer T7 expires at the terminating of ce. F or interof ce ISDN A CB or AR, this results in a timer expired message being sent to the originating of ce. At the originating of ce, if the current value of timer T6 is less than or equal to N, the ISDN ACB or AR request is deactivated. For interof ce ISDN ACB or AR, a dequeue message is sent to the terminating of ce to dequeue the request and cancel timer T10.

  Note: N is a tolerance value de ned by the operating compan y with a suggested value of 5 min.

  If the current value of timer T6 is greater than N, either originating or terminating scanning of the called line is resumed for the remainder of timer T6.
- The maximum number of ringbacks (RINGAPPL) data lled in table RESOFC has been given to the calling party's line for this ISDN ACB or AR request.
- The calling party abandons the recall before receiving audible ringing when the called party's line is idle.
- Timer T10 expires for either the originator's or terminator's requests.
- The calling party answers the recall, and a nal b usy/idle query is launched. The request is deactivated if the subscriber abandons the call before the reply to the query is received.
- The ISDN ACB or AR subscriber is force-idled by a maintenance action at the exact same moment ACB or AR distinctive ringing starts.
- An ACB or AR TCAP message is returned by the return-on-error option of SCCP.

  Note: No subsequent TCAP messaging takes place with respect to the ISDN ACB or AR request.

ISDN BRI Access to CLASS ACB/AR (continued)

The subscriber can deactivate the ISDN ACB or AR request by going off-hook, receiving dial tone, and dialing the deactivation code. The code should be in the format *XX and is de ned by the operating compan y at each ISDN ACB or AR originating switch. The recommended deactivation codes for ISDN ACB and AR are *86 and *89, respectively. Once the deactivation code is entered, all outstanding ISDN ACB or AR requests are deactivated. This is done by sending a TCAP message for each interof ce request.

The subscriber can deactivate all outstanding ISDN ACB requests by pressing the lit ISDN ACB key.

After deactivation, the deactivation announcement (DEACTANN) is returned to the calling party. If the calling party disconnects before hearing the DEACTANN announcement, the requests are still canceled (DEACTANN is returned even if there are no outstanding ISDN ACB or AR requests). The ISDN terminal displays “Monitoring off". If all ISDN ACB requests are deactivated, the ACB key lamp is turned off.

Billing

When the SUSP (subscription usage sensitive pricing) option is set to ON in table AMAOPTS (Automatic Message Accounting Options), the AMA billing option is available for the CLASS SUSP features ACB and AR. The AMA billing option is then speci ed during the addition of options ACB or AR to a subscriber line. This is done through the Service Order System (SERVORD).

Call code and structure code

The ACB and AR features generate AMA records under a call code of 330 and a structure code of 1030. When ACB and AR are activated as one-level procedures, one AMA record results from each use. When AR is activated as a two-level procedure, two AMA records result from each use. The service feature eld of the AMA record indicates v arious stages of progress of the ACB and AR features.

No AMA records are generated for ACB or AR requests receiving short- or long-term denial announcements or tones. No AMA records are generated for requests that were not completed due to system failures.

The elds of the A CB or AR billing record are as follows:

- hexadecimal identi er
- structure code
- call code
- sensor type

- sensor identi cation
- recording of ce type
- recording of ce identi cation
- date
- service feature
- activating NPA
- activating number
- far-end overseas indicator
- terminating NPA
- terminating number
- time
- elapsed time
- CLASS function
- feature status
- screen list size for SCF
- screen list size for SCRJ
- screen list size for DRCW

The following gure is an example of an AMA record generated for call code 330. The service feature represented is AR delayed processing.

Call code 330

```
HEX ID:AA STRUCTURE CODE:01030C CALL CODE:330C SENSOR TYPE:036C
SENSOR ID:0200200C  REC OFFICE TYPE:036C  REC OFFICE ID:0200200C
DATE:92301C SERV FEAT:062C ORIG NPA:613C ORIG NO:6211234C OVERSEAS
IND:1C TERM NPA:00919C TERM NO:5551212C CONNECT TIME:0932061C
ELAPSED TIME:000021635C CLASS FUNCTION:000C FEAT STAT:000C
SCRN LIST SCF:000C SCRN LIST SCR:000C SCRN LIST DRCW:000C
```

Module code 071

If option ISDNCIRCUIT is set to ON in table AMAOPTS, an AMA record with module code 071 is generated for each ACB or AR request activated from an ISDN terminal. However, when BRI calls use PRI trunks, options ISDNCIRCUIT and APPEND_PRI_MODULE must both be set to ON in table AMAOPTS before AMA records with module code 071 generate. Module code 071 provides the bearer capability and call type of the terminal

ISDN BRI Access to CLASS ACB/AR (continued)

that activated the ISDN ACB or AR request. The characters in the bearer capability eld (eld 412) of module code 071 are listed in the following table.

Bearer capability eld 412 in module code 071

Character(s)	Meaning
1	Bearer call type: • 1 = voice/voiceband data • 2 = circuit-mode data • 3 = packet-mode data
2-3	Bearer capability: • 01 = circuit mode (speech) • 02 = circuit mode (3.1 kHz) • 03 = circuit mode (unrestricted 64 kbit/s digital information transfer) • 04 = circuit mode (unrestricted 64 kbit/s digital information transfer rate adapted from 56 kbit/s) • 05 = packet mode (unrestricted digital information transfer) • 07 = circuit mode (unrestricted digital information transfer at a rate greater than 64 kbit/s) • 99 = bearer capability not recorded
4	Sign (hex C)

The following gure is an example of an AMA record generated for call code 330. Module code 071 is appended to the record.

Call code 330 with module code 071 appended

```
HEX ID:AA  STRUCTURE CODE:41030C CALL CODE:330C SENSOR TYPE:036C
SENSOR ID:0619351C REC OFFICE TYPE:036C REC OFFICE ID:0619351C
DATE:70122C CLASS FEATURE:063C ORIG NPA:613C ORIG NUMBER:6213008C
OVERSEAS IND:0C TERM NPA:00613C TERM NUMBER:6213007C
CONNECT TIME:1504589C ELAPSED TIME:000000000C CLASS FUNCTION:000C
FEATURE STATUS:000C SCRN LIST SCF:FFFF SCRN LIST SCR:FFFF
SCRN LIST DRCW:FFFF MODULE CODE:071C BEARER CAPABILITY:101C
MODULE CODE:000C
```

ISDN BRI Access to CLASS ACB/AR (continued)

Service feature codes

032
AR reactivation delayed processing. An AMA record with this code is generated during nal setup of an AR reactivated request that received delayed processing. This record is produced regardless of whether or not the call receives busy or idle, or is answered.

033
ACB delayed processing. This is the same as service feature code 032 except that it applies when the ACB activation code is dialed.

034
AR reactivation busy ringback. This service feature code appears in AMA records when an AR reactivation request receives delayed processing resulting in special ringback.

035
ACB reactivation busy ringback. This is the same as service feature code 034 except that it applies when the ACB activation code is dialed.

036
AR reactivation time-out. This service feature code appears in AMA records when an AR reactivation request receives delayed processing resulting in deactivation due to a time-out condition. This includes reaching the maximum number of unanswered special ringbacks.

037
ACB reactivation time-out. This is the same as service feature code 036 except that it applies when the ACB activation code is dialed.

038
AR reactivated deactivation. An AMA record with this service feature code is generated for each AR reactivated request deactivated when the subscriber dials the AR deactivation code.

039
ACB reactivated deactivation. This is the same as service feature code 038 except that it applies when the ACB deactivation code is dialed.

060
AR immediate processing. This service feature code is used whenever the subscriber dials the AR activation code and receives immediate processing. The busy/free indicator in the response to the initial query returned idle and the call is routed immediately. This code is also used when a line having option

ISDN BRI Access to CLASS ACB/AR (continued)

SCRJ is reached. This record is produced regardless of whether or not the call receives busy or idle, or is answered.

061
ACB immediate processing. This is the same as service feature code 060 except that it applies when the ACB activation code is dialed.

062
AR delayed processing. An AMA record with this code is generated during nal setup of an AR requested call that recei ved delayed processing. This record is produced regardless of whether or not the call receives busy or idle, or is answered.

063
ACB delayed processing. This is the same as service feature code 062 except that it applies when the ACB activation code is dialed.

066
AR time-out. This service feature code appears in AMA records when a request receives delayed processing resulting in deactivation due to a time-out condition. This includes reaching the maximum number of unanswered special ringbacks.

067
ACB time-out. This is the same as service feature code 066 except that it applies when the ACB activation code is dialed.

068
AR deactivation. An AMA record with this service feature code is generated for each AR request deactivated when the subscriber dials the AR deactivation code.

069
ACB deactivation. This is the same as service feature code 068 except that it applies when the ACB deactivation code is dialed.

The service feature codes 032, 033, 034, 035, 036, 037, 038, and 039 apply to reactivated ACB or AR requests. The type of service being reactivated depends on the access code used to reactivate. For instance, an AR request that is reactivated by the ACB key or ACB access code becomes an ACB reactivation request.

071
ISDN ACB or AR activation. If option ISDNCIRCUIT is set to ON in table AMAOPTS, an AMA record with this service feature code is generated for

each ACB or AR request activated from an ISDN terminal. However, when BRI calls use PRI trunks, options ISDNCIRCUIT and APPEND_PRI_MODULE must both be set to ON in table AMAOPTS before AMA records with module code 071 generate. Module code 071 provides the bearer capability and call type of the terminal used for the call.

Automatic Recall AMA Enhancements-Privacy Indication

The Automatic Recall AMA Enhancements-Privacy Indication feature allows the ISDN ACB or AR subscriber to place calls to a private DN without gaining access to that number. The ACB or AR status and the privacy status of the call are marked in the billing record. The private DN also appears in the billing record.

Module code 068 is added by the Automatic Recall AMA Enhancements-Privacy Indication feature. With option ACBAR_MOD_CO set to ON in table AMAOPTS, module code 068 is appended to any billing record (TOLL or SUSP) produced for an ISDN ACB or AR activation. In module code 068, eld CALLED DN DESC (called DN descriptor) re ects the ACB or AR and privacy status of the called DN. It can be set to 001, indicating ISDN ACB or AR activation to a private number, or 006, indicating ISDN ACB or AR activation to a non-private number. An example of the AMA toll record produced using option ACBAR_MOD_CO is shown in the following gure.

Example of TOLL 006 record using option ACBAR_MOD_CO

```
HEX ID:AA STRUCTURE CODE:40001C CALL CODE:006C SENSOR TYPE:036C
SENSOR ID:0200200C  REC OFFICE TYPE:036C  REC OFFICE ID:0200200C
DATE:92301C TIMING IND:01000C  STUDY IND:0000000C  ANSWER:0C SERVICE
OBSERVED:0C  OPER ACTION:0C  SERV FEAT:062C ORIG NPA:613C
ORIG NO:6211234C  OVERSEAS IND:1C TERM NPA:00919C TERM NO:5551212C
CONNECT TIME:0932061C  ELAPSED TIME:000021635C MODULE CODE:068C
CALLED DN DESC:001C MODULE CODE:000C
```

Note: AMA records generated under a call code of 330 do not contain the study indicator eld; therefore in table AMA OPTS, option ACBAR_MOD_CO must be set to ON in order to have those records marked.

In eld STUD Y IND of the billing record, eld 5 can be set to 2, indicating ISDN ACB or AR activation to a non-private number, or 3, indicating ISDN ACB or AR activation to a private number. An example of the AMA TOLL record produced using the ISDN ACB or AR feature using option ACBAR_STY_IN is shown in the following gure.

ISDN BRI Access to CLASS ACB/AR (continued)

Example of TOLL 006 record using option ACBAR_STY_IN

```
HEX ID:AA STRUCTURE CODE:40001C CALL CODE:006C SENSOR TYPE:036C
SENSOR ID:0200200C  REC OFFICE TYPE:036C  REC OFFICE ID:0200200C
DATE:92301C TIMING IND:01000C  STUDY IND:0000300C  ANSWER:0C SERVICE
OBSERVED:0C  OPER ACTION:0C  SERV FEAT:062C ORIG NPA:613C
ORIG NO:6211234C  OVERSEAS IND:1C TERM NPA:00919C TERM NO:5551212C
CONNECT TIME:0932061C  ELAPSED TIME:000021635C MODULE CODE:000C
```

Station Message Detail Recording

ISDN BRI Access to CLASS ACB/AR does not affect Station Message Detail Recording.

Data lling of ce parameter s

The following table shows the of ce parameters used by ISDN BRI Access to CLASS ACB/AR. For more information about of ce parameters, refer to *Office Parameters Reference Manual.*

Of ce parameter s used by ISDN BRI Access to CLASS ACB/AR (Sheet 1 of 2)

Table name	Parameter name	Explanation and action
OFCENG	ACB_BLOCKED_FOR_ACD_UCD	Enables or disables blocking of activation of ACB to return calls to ACD and UCD groups.
	AR_BLOCK_PRIVATE_CTX	Specifies that AR calls to private DNs are blocked. The DN to be camped on must not have the DN suppressed using the SUPPRESS option.
	AR_BLOCK_PRIVATE_TOLL_METHOD	Specifies that AR calls to private toll calls are blocked.
	NO_OF_FTR_CONTROL_BLKS	Specifies the number of feature control blocks required to allow for sufficient queues for all ACD groups.
	NO_OF_LARGE_FTR_DATA_BLKS	Specifies the number of LARGE feature data blocks required.

Of ce parameter s used by ISDN BRI Access to CLASS ACB/AR (Sheet 2 of 2)

Table name	Parameter name	Explanation and action
	NO_OF_XLARGE_EXT_BLKS	Specifies the number of EXTRA LARGE extension blocks required for the Network Message Waiting Indicator (MWI) feature.
	OFFICE_LANGUAGE	Controls announcement languages. This parameter contains two fields, PRIMARY and SECONDARY. All lines default to PRIMARY unless option SL (secondary language) is added.

Data ll sequence

The following table lists the tables that require data ll to implement ISDN BRI Access to CLASS ACB/AR. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for ISDN BRI Access to CLASS ACB/AR (Sheet 1 of 2)

Table	Purpose of table
OFCENG	Office Engineering. This table contains data on engineering parameters for the office. Refer to “Datafilling office parameters" for information on how ISDN ACB and AR affect office parameters.
RESOFC	Residential Line CLASS Office Data. This table contains data on the CLASS features and enables ISDN ACB and AR for the office.
AMAOPTS	Automatic Message Accounting Options. This table is used to control the activation and scheduling of AMA recording options.
DNREGION	DN Region. This table contains information that groups DNs into regions. Entries in this table are used to reflect the dial plan for areas served by the central office. Each DN region shown in the table has a unique region name and comprises one or more ranges of DNs.
DNREVXLA	DN Reverse Translations. This table contains tuples defining sets of digit manipulation algorithms.
Note: This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.	

ISDN BRI Access to CLASS ACB/AR (continued)

Data ll tab les required for ISDN BRI Access to CLASS ACB/AR (Sheet 2 of 2)

Table	Purpose of table
CUSTNTWK	Customer Group Network. This table contains a reverse translator name for each customer group that contains lines with the ISDN ACB and AR features.
IBNXLA	IBN Translations. This table contains the data for the digit translations of calls from an MDC station, attendant console, incoming trunk group, or incoming side of a two-way MDC trunk group.
IBNLINES (Note)	IBN Line Assignments. This table contains line assignments for each 500/2500 set assigned to an IBN, RES, and MADN station number. This table also contains line assignments for IBN attendant consoles.
KSETFEAT (Note)	Business Set and Data Unit Feature. This table lists the key assignments for features provisioned on ISDN NI-2 terminals, including the ISDN ACB and AR features.
Note: This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.	

Typical steps to set up a DMS-100 switch for ISDN ACB and AR

This list describes the basic steps required to install ISDN ACB and AR on a DMS-100 switch. It assumes the switch already has Subscriber Services RES base data ll for the intended A CB or AR subscribers.

At the MAP

1 Ensure that adequate values are data lled in tab le OFCENG using the NO_OF_FTR_CONTROL_BLKS and NO_OF_LARGE_FTR_DATA_BLKS parameters.

2 If the previous two items require changing a parameter, perform a cold or reload restart.

For more information, refer to “Data lling of ce par ameters."

3 Add ACBA, ACBD, ARA, and ARD activation and deactivation codes in table IBNXLA for the appropriate translators.

4 Record and de ne suitab le announcements for ISDN ACB and AR in tables DRAMS, CLLI, ANNS, ANNMEMS, and DRMUSERS.

Note: Tables DRAMS, CLLI, ANNS, ANNMEMS, and DRMUSERS must be data lled in order f or the ISDN ACB and AR announcements to function. Refer to “Data ll f or ISDN ACB and AR announcements" for examples of data ll f or announcements, and to “Appendix A Data lling announcements" for Subscriber Services general announcement

information. For complete information, refer to *DRAM and EDRAM Guide*, 297-1001-527.

5 Fill in ACB and AR tuples in table RESOFC. For now, leave eld ENABLED set to N.

6 Add TCAP data to tables C7LOCSSN (CCS7 Local Subsystem), C7NETSSN (CCS7 Network Subsystem Routing), C7GTTYPE (CCS7 Global Title Translation Type), and C7GTT (CCS7 Global Title Translation) to handle the CLASS subsystem.

7 De ne netw ork dial plan data ll in tab les CUSTNTWK, DNREGION, and DNREVXLA.

8 Add line options ACB and AR to all lines requiring these options.

9 Busy (BSY) and return to service (RTS) the CLASS TCAP subsystem, along with any CCS7 linksets or route sets necessary for its operation.

10 RTS the ISDN ACB and AR announcements.

11 Set eld ENABLED in tuples A CB and AR to Y in table RESOFC.

Treatments used by ISDN ACB and AR

The following DMS treatments are used by ISDN ACB and AR:

- feature not allowed (FNAL)
- negative acknowledgment (NACK)
- network blockage heavy traf c (NBLH)
- no software resource (NOSR)
- no service circuit (NOSC)
- system failure (SYFL)

Each of these treatments can be data lled as either a list of tones, a list of announcements, or both. Operating companies should data ll each of these treatments to be reorder tone. In certain cases, ISDN ACB or AR forces these treatments to be reorder tone.

Refer to “Appendix D Quick reference for switch timers, announcements, and treatments for ACB/AR" for a complete list of ACB and AR treatments.

Network dial plan

ISDN ACB and AR require the network dial plan in order to function. More speci cally , ISDN AR requires NDP data ll to generate a dialable DN from the 10-digit DN stored in the ICM slot.

For ISDN ACB, the network dial plan is required on the originating of ce. If ISDN ACB subscribers located in the originating of ce can use se ven-digit dialing to reach a line with a different NPA, extra data ll is needed for ISDN ACB in table DNREGION or table DNREVXLA.

ISDN BRI Access to CLASS ACB/AR (continued)

RES default data ll

Four feature activation and deactivation access codes are required by ISDN ACB and AR: ACBA (automatic call back activate), ACBD (automatic call back deactivate), ARA (automatic recall activate), and ARD (automatic recall deactivate). These codes are data lled in table IBNXLA.

Tuples must be added in table IBNXLA for the Subscriber Services feature translator to translate the ISDN ACB and AR access codes. The recommended access codes are *66 (ACB activation), *69 (AR activation), *86 (ACB deactivation), and *89 (AR deactivation).

Data lling tab le RESOFC

The following table shows the data ll speci c to ISDN BRI Access to CLASS ACB/AR for table RESOFC (Residential Line CLASS Of ce Data). Only those elds that apply directly to ISDN BRI Access to CLASS A CB/AR are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le RESOFC (Sheet 1 of 5)

Field	Subfield or refinement	Entry	Explanation and action
KEY		see subfield	Key. This field consists of subfield FEATNAME.
	FEATNAME	ACB or AR	Feature name. This subfield is the key to the table. It specifies the name of the feature. Enter ACB or AR.
ENABLED		Y or N	Enabled. This field specifies whether or not the feature is enabled in the office. Enter Y or N. ***Note:*** The default value for each CLASS feature included in the load is N (disabled).
FEATDATA		see subfields	Feature data. This field consists of subfields ACCESS, FEATNAME, ACTLEVEL, T2, T5, T6, T10, TSCAN, N, RINGCYCL, RINGAPPL, TERMSCAN, COINLINE, HUNTLINE, PBXLINE, and TCAP_QUERY_ENABLED.

ISDN BRI Access to CLASS ACB/AR (continued)

Data lling tab le RESOFC (Sheet 2 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	ACCESS	SUBSCR	Feature access. This subfield specifies how the feature is accessed. Enter SUBSCR to indicate subscription access only. ***Note:*** The UNIVER (universal access) entry for this subfield is not valid for ISDN ACB and AR.
	FEATNAME	ACB or AR	Feature name. This subfield specifies the feature name. Enter ACB or AR.
	ACTLEVEL	ONELEVEL or TWOLEVEL	Activation level. This subfield specifies whether one- or two-level activation is used on ISDN AR calls. One-level activation applies if the value of the field is set to ONELEVEL. Two-level activation applies if the value of the field is set to TWOLEVEL. Enter ONELEVEL or TWOLEVEL (the default is ONELEVEL).
	T2	3 to 12	T2. This subfield specifies the length of time (in minutes) that the originating switch waits between stopping recall ringing and sending out a message to request to reactivate the queue position. Enter a value from 3 to 12 (the default is 5).
	T5	2 to 10	T5. This subfield specifies the length of time (in seconds) that the originating switch allows for a response from the terminating switch. Enter a value from 2 to 10 (the default is 3).
	T6	5 to 35	T6. This subfield specifies the length of time (in minutes) that the originating switch scans or waits for a free notification message from the terminating switch. Enter a value from 5 to 35 (the default is 30).
	T10	60 to 180	T10. This subfield specifies the queue sanity timer for both originating and terminating switches (in minutes). Enter a value from 60 to 180 (the default is 180).

ISDN BRI Access to CLASS ACB/AR (continued)

Data lling tab le RESOFC (Sheet 3 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	TSCAN	30 to 120	Time scan. This subfield specifies the length of time (in seconds) between busy/idle queries when the originator is performing originating scanning. Enter a value from 30 to 120 (the default is 120). ***Note:*** Timer T11 in the terminating node is set equal to TSCAN + 5 s.
	N	0 to 10	N. This subfield specifies the tolerance timer for aligning the values of timer T6 and the queue entry timer (T7) at the terminating switch. If the value of timer T6 is greater than N when the originator receives a service time-out message from the terminating switch, a message is sent to reset timer T7 to the remaining time of timer T6. Enter a value from 0 to 10 (the default is 5).
	RINGCYCL	2 to 7	Ring cycle. This subfield specifies the number of 6-s ring cycles during which recall ringing is given. Enter a value from 2 to 7. Note that timer T8 on the terminating switch is set equal to RINGCYCL $\times$ 6 + 5 s.
	RINGAPPL	1 to 12	Ring application. This subfield specifies the number of times that unanswered recall ringing is given to a calling party. Enter a value from 1 to 12 (the default is 2).
	TERMSCAN	Y or N	Terminating scanning. This subfield specifies the flag to control whether the originating switch requests terminating scanning. Enter Y (the default) to request terminating scanning. Enter N to simply send busy/idle queries (never request terminating scanning).
	COINLINE	ACCEPT or DENY	Coin line. This subfield specifies whether an originating switch accepts or denies an ISDN ACB or AR request for a returned line type of COINLINE and DN match of match. Enter ACCEPT or DENY (the default is DENY).

ISDN BRI Access to CLASS ACB/AR (continued)

Data lling tab le RESOFC (Sheet 4 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	HUNTLINE	ACCEPT or DENY	Hunt line. This field specifies whether an originating switch accepts or denies an ISDN ACB or AR request for a returned line type of HUNTLINE and DN match of match or no match. Enter ACCEPT or DENY (the default is DENY).
	PBXLINE	ACCEPT or DENY	Private branch exchange line. This subfield specifies whether an originating switch accepts or denies an ISDN ACB or AR request for a returned line type of PBX line and DN match of no match. Enter ACCEPT or DENY (the default is DENY).
	TCAP_QUERY_ ENABLED	Y or N	TCAP query enabled. Enter Y to enable TCAP query. Enter N to disable TCAP query. The default is Y. If the value of the TCAP_QUERY_ENABLED field is changed from Y to N, and the SOC option RES00073 is not on, the following message will be displayed: “Change will not be active until SOC option RES00073 is turned ON."
Note: If subfield ACTLEVEL is set to TWOLEVEL, the following subfields are prompted for: BADIGITS and TIMEOUT.			
	BADIGITS	0 to 7	Bad digits. This subfield specifies the number of times a subscriber can enter the wrong digit and receive a repeated prompt announcement. If the limit is exceeded, the subscriber is routed to NACK treatment. Enter a value from 0 to 7. (Entering 0 disables repeat announcements for invalid input.)

ISDN BRI Access to CLASS ACB/AR (continued)

Data lling tab le RESOFC (Sheet 5 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	TIMEOUT	0 to 7	Time out. This subfield specifies the number of times a subscriber can wait too long to enter digits and receive a repeated prompt announcement. If the limit is exceeded, the subscriber is routed to NACK treatment. Enter a value from 0 to 7. (Entering 0 disables repeat announcements for timed-out input.)
FNALANN		see subfields	Feature not allowed announcement. This field consists of subfields POTS_ACCESS and FNAL_CLLI.
	POTS_ACCESS	00 to 99	POTS access. This subfield specifies the two-digit POTS access code for activation of the CLASS feature that is used in POTS translation. The entry in this subfield must be identical to the table access code datafilled in table IBNXLA and used by the MDC lines. Enter a value from 00 to 99.
	FNAL_CLLI	1 to 16 alphanumeric characters	Announcement CLLI. This subfield specifies the announcement CLLI for the announcement given when the subscriber tries to activate a feature to which the line has not subscribed. If the feature is disabled (field ENABLED is set to N), POTS lines receive PDIL (partial dial) treatment and CLASS lines receive FNAL treatment. The CLLI must first be datafilled in tables CLLI, ANNS, ANNMEM and DRAMTRK. Enter 1 to 16 alphanumeric characters.

Data ll e xample for table RESOFC

The following example shows sample data ll for table RESOFC. The AR tuple contains sub eld ACTLEVEL data lled as TWOLEVEL, indicating that two-level activation is used for ISDN AR.

MAP display example for table RESOFC

```
KEY    ENABLED                                          FEATDATA
          FNALANN
_____________________________________________________________
AR      Y        SUBSCR     AR TWOLEVEL 5 5 30 180 120
5 5 2 Y DENY DENY DENY N 2 7
          $

ACB      Y       SUBSCR     ACB 5 5 30 180 120  5 5 2 Y
DENY DENY DENY Y
          $
```

Data lling tab le AMAOPTS

The settings of options ACBAR_MOD_CO and ACBAR_STY_IN in table AMAOPTS (Automatic Message Accounting Options) determine where the ACB/AR and privacy information for a call are stored. To have the ACB/AR and privacy status of a call stored in the module code, set option ACBAR_MOD_CO to ON. To have the ACB/AR and privacy status of a call stored in the study indicator, set option ACBAR_STY_IN to ON. Setting both options to OFF leaves billing unchanged.

If option ISDNCIRCUIT is set to ON in table AMAOPTS, an AMA record with module code 071 is generated for each ACB or AR request activated from an ISDN terminal. However, when BRI calls use PRI trunks, options ISDNCIRCUIT and APPEND_PRI_MODULE must both be set to ON in table AMAOPTS before AMA records with module code 071 generate. Module code 071 provides the bearer capability and call type of the terminal that activated the ISDN ACB or AR request.

The following table shows the data ll speci c to ISDN BRI Access to CLASS ACB/AR for table AMAOPTS. Only those elds that apply directly to ISDN

ISDN BRI Access to CLASS ACB/AR (continued)

BRI Access to CLASS ACB/AR are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le AMAOPTS

Field	Subfield or refinement	Entry	Explanation and action
OPTION		see subfield	Option. This field consists of subfield AMAOPT.
	AMAOPT	ACBAR_MOD_CO, ACBAR_STY_IN, ISDNCIRCUIT, APPEND_PRI_MODULE	AMA option. This subfield specifies the AMA option. Enter one of the following values: • Enter ACBAR_MOD_CO to store the ACB/AR and privacy status of a call in the module code. • Enter ACBAR_STY_IN to store the ACB/AR and privacy status of a call in the study indicator. • Enter ISDNCIRCUIT to generate an AMA record with module code 071 for each ACB or AR request activated from an ISDN terminal. • Enter APPEND_PRI_MODULE to generate an AMA record with module code 071 for each ACB or AR request activated from an ISDN terminal where the call makes use of PRI trunks.
SCHEDULE		see subfield	Schedule. This field consists of subfields AMASEL, ONDATE, OFFDATE, SCHED, ONTIME, and OFFTIME. Only subfield AMASEL pertains to this feature.
	AMASEL	ON	AMA selector. Enter ON to activate the option immediately.

Data ll e xample for table AMAOPTS

The following example shows sample data ll for table AMA OPTS.

MAP display example for table AMAOPTS

```
OPTION              SCHEDULE
_____________________________________________________________________
SUSP                   ON
ACBAR_MOD_CO           ON
ACBAR_STY_IN           ON
ISDNCIRCUIT            ON
APPEND_PRI_MODULE      ON
```

Data lling tab le DNREGION

A tuple in table DNREGION (DN Region) associates a region name with one range of DNs. A DN region that consists of two or more ranges of DNs is de ned using multiple tuples.

The DN regions required for processing ISDN AR calls can be

- local calling areas, within which calls are made by dialing seven digits
- local NPAs, each of which includes
  - — all or part of a local calling area
  - — a local toll area, within which calls are made by dialing eight digits (1 + seven digits)
- a group of NPAs (excluding the local NPA), to which calls are made using 11-digit dialing

The DN regions required for processing ISDN ACB calls are all local calling areas, within which calls are made by dialing seven digits.

The following table shows the data ll speci c to ISDN BRI Access to CLASS ACB/AR for table DNREGION. Only those elds that apply directly to ISDN

ISDN BRI Access to CLASS ACB/AR (continued)

BRI Access to CLASS ACB/AR are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le DNREGION

Field	Subfield or refinement	Entry	Explanation and action
DNRGNKEY		see subfields	Directory number region key. This field consists of subfields REGION, FROMDIGS, and TODIGS.
	REGION	1 to 15 alphanumeric characters	DN region name. This subfield specifies the DN region that the tuple defines. Enter 1 to 15 alphanumeric characters.
	FROMDIGS	1 to 11 digits	From digits. This subfield specifies the lower bounds of a range of numbers belonging to the DN region indicated in subfield REGION. Enter 1 to 11 digits.
	TODIGS	1 to 11 digits	To digits. This subfield specifies the upper bounds of a range of numbers belonging to the DN region indicated in subfield REGION. Enter a value consisting of 1 to 11 digits, but equal to or greater than the number indicated in subfield FROMDIGS.

Data ll e xample for table DNREGION (ISDN ACB)

The following example shows sample data ll for table DNREGION for the ISDN ACB feature. It uses the seven-digit DN format used in ACB calls.

MAP display example for table DNREGION (ISDN ACB with seven-digit ACB format)

```
REGION      FROMDIGS        TODIGS
_____________________________________________________________
LOCAL_A1          822          823
LOCAL_A1          952          952
```

Data ll e xample for table DNREGION (ISDN AR)

The following example shows sample data ll for table DNREGION for the ISDN AR feature. It shows the table DNREGION tuples (using the 10-digit DN format used in AR calls) used to de ne a local calling area, LOCAL_A, that includes all the DNs beginning with digits 613822, 613823, and 613952.

MAP display example for table DNREGION (ISDN AR with 10-digit AR format)

```
REGION      FROMDIGS        TODIGS
_____________________________________________________________
LOCAL_A        613822         613823
LOCAL_A        613952         613952
```

Data lling tab le DNREGION (ISDN ACB reverse translations)

When ISDN ACB is activated, it immediately checks to determine whether the DN (copied from the OCM) is valid and whether the destination line is busy. Where the destination line is served by another switch, the check is carried out using an initial busy/idle query message. The message is sent using the CLASS TCAP application.

To supply the TCAP application with the destination DN in the required 10-digit x ed format (NPA-NXX-XXXX), ISDN ACB must reverse translate a 7-, 8-, or 11-digit dialed DN.

ISDN ACB can reverse translate all 8-, 10-, and 11-digit numbers into the 10-digit form required by the CLASS TCAP application based solely on the number of digits in the DN.

For example, some subscribers served by of ce Y (refer to the follo wing gure) can dial numbers in the 613 and 819 NP As using seven-digit dialing. ISDN ACB reverse translations data ll is required so that the seven-digit DNs called by these subscribers can be pre x ed with the correct NPA.

ISDN ACB reverse translations data ll must de ne re gions in table DNREGION that include the following:

- all DNs served by of ce Y where a subscriber can call a DN in another NPA by dialing seven digits
- all DNs that can be called by subscribers using seven-digit dialing

This is achieved by de ning four re gions as follows:

- R613T819—This region contains all subscribers served by of ce Y with an NPA of 613 who can dial 819 DNs using seven-digit dialing. This

ISDN BRI Access to CLASS ACB/AR (continued)

region also contains all 819 DNs these subscribers can reach using seven-digit dialing.

- R613T613—This region contains the same 613 NPA subscribers identi ed in the R613T819 region, and all the 613 DNs these subscribers can reach using seven-digit dialing.
- R819T613—This region contains all subscribers served by of ce Y with an NPA of 819 who can dial 613 DNs using seven-digit dialing. This region also contains all 613 DNs these subscribers can reach using seven-digit dialing.
- R819T819—This region contains the same 819 NPA subscribers identi ed in the R819T613 region, and all the 819 DNs these subscribers can reach using seven-digit dialing.

The following table shows the data ll speci c to ISDN BRI Access to CLASS ACB/AR for table DNREGION for ISDN ACB reverse translations. Only those elds that apply directly to ISDN BRI Access to CLASS A CB/AR are shown. For a description of the other elds, refer to the data schema section of this document.

Data ll e xample for table DNREGION (ISDN ACB reverse translations)

The following example shows sample data ll for table DNREGION for ISDN ACB reverse translations.

MAP display example for table DNREGION (ISDN ACB reverse translations)

```
REGION          FROMDIGS        TODIGS
_____________________________________________________
R613T819            822           824
R613T819            723           725

R613T613            822           824

R819T613            723           724
R819T613            822           824

R819T819            722           725
```

Note 1: The FROMDIGS and TODIGS are based on seven-digit DNs because DN10DXLA entries are accessed using seven-digit DNs.

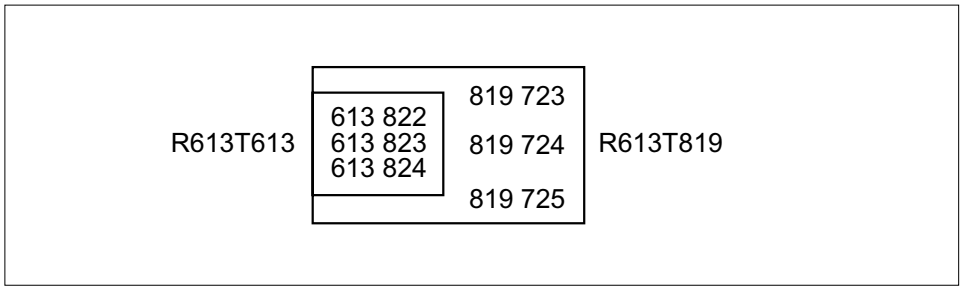
Note 2: The 819 722 DNs are only included in the R819T819 region because the 613 NPA subscribers served by of ce Y cannot use seven-digit dialing to reach 819 722 DNs.

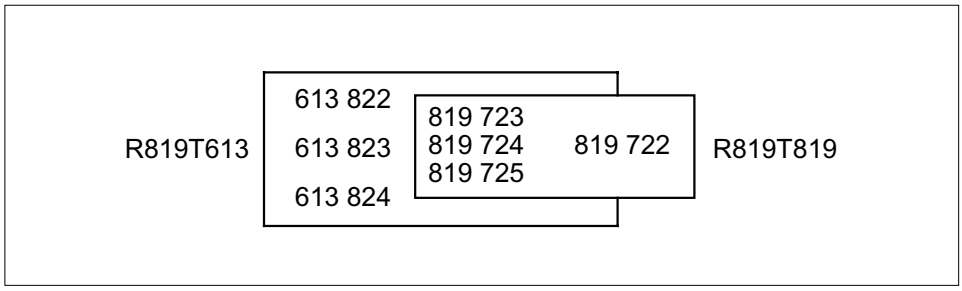
ISDN BRI Access to CLASS ACB/AR (continued)

Note 3: It is not necessary to include 613 952 subscribers in any of the preceding regions.

Note 4: The R613T613 and R613T819 areas overlap as shown in the rst gure belo w.

Note 5: The R819T819 and R819T613 areas overlap as shown in the second gure belo w.





Data lling tab le DNREGION (ISDN AR reverse translations)

ISDN AR attempts to set up a call using the DN stored in the subscriber's ICM. This “recalled" DN is the 10-digit number received as the calling DN for the last incoming call.

To perform call setup, ISDN AR must convert the recalled DN to its dialable form by reverse translating the 10-digit DN into one of the following formats:

- a 7-digit DN, required to set up local calls
- an 8-digit (1 + 7-digit) DN, required to set up chargeable calls within the same NPA
- an 11-digit DN, required to set up calls to other NPAs

ISDN AR reverse translations for of ce Y must de ne all the local calling areas and the toll (NPA) areas that include of ce Y subscribers in table DNREGION.

ISDN BRI Access to CLASS ACB/AR (continued)

The following table shows the data ll speci c to ISDN BRI Access to CLASS ACB/AR for table DNREGION for ISDN AR reverse translations. Only those elds that apply directly to ISDN BRI Access to CLASS ACB/AR are shown. For a description of the other elds, refer to the data schema section of this document.

MAP display example for table DNREGION (ISDN AR reverse translations)

```
REGION          FROMDIGS        TODIGS
_____________________________________________

 LOCAL_A          613822         613823
 LOCAL_A          819723         819724

 LOCAL_B          819722         819725

 LOCAL_C          613823         613824
 LOCAL_C          819724         819725

 LOCAL_D          613952         613952

TOLL_613             613            613

TOLL_819             819            819
```

Note: Two toll regions, TOLL_613 and TOLL_819, must be de ned, since this of ce serv es more than one NPA.

Data lling tab le DNREVXLA

Tuples must be added to table DNREVXLA (DN Reverse Translations) to de ne how dialed digits for ISDN ACB should be manipulated to produce the called number (NPA-NXX-XXXX) if the called number has an NPA different from the originator's NPA. The reverse translator used for this purpose is DN10DXLA. This reverse translator name is hard-coded and need not be de ned in an y other table. These digits are used to identify the terminator during the ISDN ACB service.

Tuples must be added to table DNREVXLA to de ne how incoming digits for ISDN AR should be manipulated to produce the dialed digits. These digits are used to make the subsequent call when ISDN AR is answered.

ISDN BRI Access to CLASS ACB/AR (continued)

Tuples for ISDN ACB processing

A single tuple in table DNREVXLA is required for the ISDN ACB feature if any of the local calling areas served by the central of ce include numbers in more than one NPA. Examples of this situation are as follows:

- Ottawa, where a local calling area could include Ottawa (613 area code) and Hull (819 area code) numbers
- New York, where a local calling area could include Long Island (516 area code) and Manhattan (212 area code) numbers

The ACB tuple contains two digit manipulation algorithms. Both pre x the seven-digit destination DN with an NPA.

Tuples for ISDN AR processing

The ISDN AR feature uses multiple tuples in table DNREVXLA. Each tuple applies to a range of recalled DNs, and each tuple can contain several digit manipulation algorithms. Each digit manipulation algorithm within a tuple is associated with a DN region. An algorithm is applied when the recalled DN and the ISDN AR subscriber's DN are both within the DN region.

The following table shows the data ll speci c to ISDN BRI Access to CLASS ACB/AR for table DNREVXLA. Only those elds that apply directly to ISDN BRI Access to CLASS ACB/AR are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le DNREVXLA (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
RVXLAKEY		see subfields	DN reverse translations key. This field consists of subfields RXLANAME, FROMDIGS, and TODIGS.
	RXLANAME	1 to 8 alphanumeric characters	Reverse translator name. This subfield specifies the DN translator name. A DN translator can have more than one tuple in table DNREVXLA. All tuples belonging to the same DN translator should have the same DN translator name. Enter 1 to 8 alphanumeric characters.
	FROMDIGS	1 to 11 digits	From digits. This subfield specifies the lowest DN of a range of calling party DNs to which this tuple applies. Enter 1 to 11 digits.

ISDN BRI Access to CLASS ACB/AR (continued)

Data lling tab le DNREVXLA (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	TODIGS	1 to 11 digits	To digits. This subfield specifies the highest DN of a range of calling party DNs to which this tuple applies. Enter a value consisting of 1 to 11 digits, but equal to or greater than the value indicated in subfield FROMDIGS.
RESULTS		see subfields	Translations results. This field consists of subfields REGION, DELDIGS, PRFXDIGS, and OPTPRFX.
	REGION	region name or DEFAULT	DN region name. This subfield specifies the DN region name, previously defined in table DNREGION. Enter the region name. ***Note:*** The DEFAULT region name specifies a region that includes all possible DNs.
	DELDIGS	0 to 15	Delete digits. This subfield specifies the number of leading digits to delete from the calling party DN. Digits are deleted starting from the left. Enter a value from 0 to 15.
	PRFXDIGS	N or string of 1 to 11 digits	Prefix digits. This subfield specifies the digits to be added to the destination DN. Enter up to 11 prefix digits, or enter N if no digits are to be prefixed.
	OPTPRFX	N or string of 1 to 11 digits	Optional prefix digits. This subfield specifies digits that may optionally be prefixed to the input digit string. Enter up to 11 optional prefix digits, or enter N if there are no optional prefix digits. The total number of digits specified in fields PRFXDIGS and OPTPRFX cannot exceed 18.

Data ll e xample for table DNREVXLA

The following example shows sample data ll for table DNREVXLA. This example shows the table DNREVXLA tuples (using a 10-digit DN format used in ISDN AR calls) for an of ce serving numbers in the 613 NPA only and where all the numbers served are in the same local calling area.

MAP display example for table DNREVXLA

```
RXLANAME FROMDIGS TODIGS                          RESULTS
_____________________________________________________________
POTS      000      612   (DEFAULT  0      1      N) $
POTS      612     613   (LOCAL_A  3      N      N)
      (DEFAULT  0      1      N) $
POTS      614     999    (DEFAULT  0      1      N) $
```

Data lling tab le DNREVXLA (ISDN ACB reverse translations)

The next step in creating the necessary ISDN ACB reverse translations data ll is to de ne the digit-manipulation algorithms in table DNREVXLA.

Two algorithms are required:

- algorithm 1—no leading digits are to be deleted (DELDIGS = 0), add 613 pre x (PRFXDIGS = 613 and OPTPRFX = N)
- algorithm 2—no leading digits are to be deleted (DELDIGS = 0), add 819 pre x (PRFXDIGS = 819 and OPTPRFX = N)

Each algorithm is applied to two call types:

- For calls originated by 613 NPA subscribers who can use seven-digit dialing to dial 819 NPA subscribers, the following occurs:
  - — Calls destined to other 613 NPA subscribers (within region R613T613) have the seven-digit destination DN pre x ed with 613 (algorithm 1).
  - — Calls destined to 819 NPA subscribers (within region R613T819 *but not within region R613T613*) have the seven-digit destination DN pre x ed with 819 (algorithm 2).
- For calls originated by 819 NPA subscribers who can use seven-digit dialing to dial 613 NPA subscribers, the following occurs:
  - — Calls destined to other 819 NPA subscribers (within region R819T819) have the seven-digit destination DN pre x ed with 819 (algorithm 2).
  - — Calls destined to 819 NPA subscribers (within region R819T613 *but not within region R819T819)* have the seven-digit destination DN pre x ed with 613 (algorithm 1).

Data ll e xample for table DNREVXLA (ISDN ACB reverse translations)

The following example shows sample data ll for table DNREVXLA for ISDN ACB reverse translations. The example illustrates the recommended data ll for the ISDN ACB conversion algorithms in table DNREVXLA for of ce Y .

ISDN BRI Access to CLASS ACB/AR (continued)

```
RXLANAME FROMDIGS TODIGS                          RESULTS
_____________________________________________________________
DN10DXLA   822    824    (R613T613  0    613    N)
                          (R613T819  0    819    N) $
DN10DXLA   723    724    (R819T819  0   819    N)
       (R819T613  0    613    N) $
```

Note 1: As the DN10DXLA tuples in table DNREVXLA are accessed using the seven-digit ISDN ACB subscriber's DN, the rst tuple is applied to calls originated by 613 NPA subscribers who can use seven-digit dialing to dial 819 NPA subscribers; the second tuple is applied to calls originated by 819 NPA subscribers who can use seven-digit dialing to dial 613 NPA subscribers.

Note 2: The algorithms are processed in the sequence in which they appear within a tuple. Because the algorithm for the R613T613 region appears before the algorithm for the R613T819 region, calls between 613 NPA DNs will access the 613 pre x digits. Similarly , in the second tuple, calls between 819 NPA DNs will access the 819 pre x digits.

Data lling tab le DNREVXLA (ISDN AR reverse translations)

The next step in creating the necessary ISDN AR reverse translations data ll for of ce Y is to de ne the digit manipulation algorithms in table DNREVXLA.

Three algorithms are required:

- algorithm 1—no leading digits are to be deleted (DELDIGS = 0), add pre x of 1 (PRFXDIGS = 1 and OPTPRFX = N)
- algorithm 2—three leading digits are to be deleted (DELDIGS = 3), no pre x added (PRFXDIGS = N and OPTPRFX = N)
- algorithm 3—three leading digits are to be deleted (DELDIGS = 3), add pre x of 1 (PRFXDIGS = 1 and OPTPRFX = N)

The algorithms are applied to the following call types:

- For recalled DNs with NPAs not equal to 819 or 613, the 10-digit recalled DNs are converted to 11 digits by adding a pre x of 1 (algorithm 1).
- For recalled DNs with NPAs equal to 613, the following occurs:
  - — Where the ISDN AR subscriber's number and the recalled DN are both in the LOCAL_A region, or are both in the LOCAL_C region, or are

both in the LOCAL_D region, the 10-digit recalled DN is converted to 7 digits by deleting the 3 leading digits (algorithm 2).

— Where the ISDN AR subscriber's number and the recalled DN both have an NPA of 613, the 10-digit recalled DN is converted to 8 digits by deleting the 3 leading digits and adding a pre x of 1 (algorithm 3).

— In all other instances, the 10-digit recalled DN is converted to 11 digits by adding a pre x of 1 (algorithm 1).

- For recalled DNs with NPAs equal to 819, the following occurs:

— Where the ISDN AR subscriber's number and the recalled DN are both in the LOCAL_A region, or are both in the LOCAL_B region, or are both in the LOCAL_C region, the 10-digit recalled DN is converted to 7 digits by deleting the 3 leading digits (algorithm 2).

— Where the ISDN AR subscriber's number and the recalled DN both have an NPA of 819, the 10-digit recalled DN is converted to 8 digits by deleting the 3 leading digits and adding a pre x of 1 (algorithm 3).

— In all other instances, the 10-digit recalled DN is converted to 11 digits by adding a pre x of 1 (algorithm 1).

Data ll e xample for table DNREVXLA (ISDN AR reverse translations)

The following example shows sample data ll for table DNREVXLA for ISDN AR reverse translations. The example illustrates the recommended data ll for the conversion algorithms in table DNREVXLA for of ce Y .

MAP display example for table DNREVXLA (ISDN AR reverse translations)

```
RXLANAME FROMDIGS TODIGS                          RESULTS
_____________________________________________________________
RESRX      000    612   ( DEFAULT   0     1    N ) $
RESRX      613    613   ( LOCAL_A   3     N    N )
                      ( LOCAL_C   3     N    N )
                   ( LOCAL_D   3     N    N )
                ( TOLL_613     3     1    N )
                   ( DEFAULT   0     1    N ) $
RESRX      614    818    ( DEFAULT   0     1    N ) $
RESRX      819    819    ( LOCAL_A   3     N    N )
                         ( LOCAL_B   3     N    N )
                         ( LOCAL_C   3     N    N )
                      ( TOLL_819     3     1    N )
                         ( DEFAULT   0     1    N ) $
RESRX      820    999    ( DEFAULT   0     1    N ) $
```

ISDN BRI Access to CLASS ACB/AR (continued)

Data lling tab le CUSTNTWK

A reverse translator name must be added to table CUSTNTWK (Customer Group Network) for each customer group that contains lines with the ISDN ACB and AR features. Refer to “RES Base" for details on data lling table CUSTNTWK.

Data lling tab le IBNXLA

Table IBNXLA (IBN Translations) contains the data for the digit translations of calls from an MDC station, attendant console, incoming trunk group, or incoming side of a two-way MDC trunk group.

Data ll in table IBNXLA de nes the access codes used to acti vate and deactivate ISDN ACB and AR.

The recommended format of the access codes is *XX. The recommended activation codes are *66 for ISDN ACB and *69 for ISDN AR. The recommended deactivation codes are *86 for ISDN ACB and *89 for ISDN AR.

The following table shows the data ll speci c to ISDN BRI Access to CLASS ACB/AR for table IBNXLA. Only those elds that apply directly to ISDN BRI Access to CLASS ACB/AR are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le IBNXLA (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
KEY		see subfields	Key. This field consists of subfields XLANAME and DGLIDX. These subfields must be entered in succession.
	XLANAME	RXCFN	Translator name. This subfield specifies the 1- to 8-character name assigned to the translator. Enter RXCFN.
	DGLIDX	66 (ACB) or 69 (AR) for the activation code and 86 (ACB) or 89 (AR) for the deactivation code	Digilator index. This subfield specifies the digit or digits assigned to the index as the access code. Enter 66 (ISDN ACB) or 69 (ISDN AR) for the activation code and 86 (ISDN ACB) or 89 (ISDN AR) for the deactivation code.

ISDN BRI Access to CLASS ACB/AR (continued)

Data lling tab le IBNXLA (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
RESULT		see subfields	Result. This field consists of subfields TRSEL, ACR, SMDR, and FEATURE.
	TRSEL	FEAT	Translation selector. This subfield specifies the translation selector. Enter FEAT.
	ACR	N	Account entry code. This subfield specifies whether or not an account entry code is required. Enter N.
	SMDR	N	Station Message Detail Recording. This subfield specifies whether or not SMDR is required. Enter N.
	FEATURE	ACBA or ARA; or ACBD or ARD	Feature. This subfield specifies the name of the feature to which the code is assigned. Enter ACBA or ARA to indicate the access code for activating ISDN ACB or AR, respectively; enter ACBD or ARD to indicate the access code for deactivating ISDN ACB or AR, respectively.

Data ll e xample for table IBNXLA

The following example shows sample data ll for table IBNXLA.

MAP display example for table IBNXLA

```
          KEY                     RESULT
________________________________________________________
RXCFN        66        FEAT     N    N    N         ACBA
RXCFN        69        FEAT     N    N    N         ARA
RXCFN        86        FEAT   N      N    N  ACBD
RXCFN        89        FEAT   N      N    N  ARD
```

Translation veri cation tools

The following example shows the output from TRAVER when it is used to verify ISDN BRI Access to CLASS ACB/AR for the ISDN ACB feature.

ISDN BRI Access to CLASS ACB/AR (continued)

TRAVER output example for ISDN BRI Access to CLASS ACB/AR (ISDN ACB)

```
> TRAVER L 6215099 'B66' B
TABLE KSETLINE
ISDN 120 1 DN Y 6215099 IBNTST 0 0 613 (SFC) (ACB) (AR) $
TABLE DNATTRS
613 621 5099 $
   (BC ( SPEECH N $) (3_1_KHZ N $) $)$
TABLE DNGRPS
613 621 5099 5099
   (PUBLIC ( NAME DNGRPS_PUBLIC) $)
   (PRIVATE ( NAME DNGRPS_PRIVATE) $)$
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
AIN Orig Attempt TDP: no subscribed trigger.
TABLE NCOS
IBNTST 0 0 0 TST10 ( XLAS CXT1 RXCFN NDGT) ( OHQ 0 TONE_OHQ)
( CBQ 0 1 Y 2) ( ERWT ) ( ACR N) (IDDDARS N)$
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT,
AND DIGCOL
IBNTST NXLA CXT3 RXCFN 0 TST1
TABLE DIGCOL
TUPLE NOT FOUND
Default is RPT
TABLE IBNXLA: XLANAME RXCFN
RXCFN 66 FEAT N N ACBA

+++ TRAVER:  SUCCESSFUL CALL TRACE +++
```

The following example shows the output from TRAVER when it is used to verify ISDN BRI Access to CLASS ACB/AR for the ISDN AR feature.

ISDN BRI Access to CLASS ACB/AR (continued)

TRAVER output example for ISDN BRI Access to CLASS ACB/AR (ISDN AR)

```
> TRAVER L 6215099 'B69' B
TABLE KSETLINE
ISDN 120 1 DN Y 6215099 IBNTST 0 0 613 (SFC) (ACB) (AR) $
TABLE DNATTRS
613 621 5099 $
   (BC ( SPEECH N $) (3_1_KHZ N $) $)$
TABLE DNGRPS
613 621 5099 5099
   (PUBLIC ( NAME DNGRPS_PUBLIC) $)
   (PRIVATE ( NAME DNGRPS_PRIVATE) $)$
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
AIN Orig Attempt TDP: no subscribed trigger.
TABLE NCOS
IBNTST 0 0 0 TST10 ( XLAS CXT1 RXCFN NDGT) ( OHQ 0 TONE_OHQ)
( CBQ 0 1 Y 2) ( ERWT ) ( ACR N) (IDDDARS N)$
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT,
AND DIGCOL
IBNTST NXLA CXT3 RXCFN 0 TST1
TABLE DIGCOL
TUPLE NOT FOUND
Default is RPT
TABLE IBNXLA: XLANAME RXCFN
RXCFN 66 FEAT N N ARA

+++ TRAVER:  SUCCESSFUL CALL TRACE +++
```

SERVORD

The ACB and AR options are assigned to ISDN BRI subscriber lines using SERVORD.

To assign ISDN ACB or AR to an existing line, use the ADO (add option) command. Use the NEW (establish service) command to add option ACB or AR to a line that is being created. Use the DEO (delete option) command to delete the options from a line. Use the OUT (remove service) command to delete the options as well as the whole line entry.

ACB and AR are valid options for all SERVORD commands that take an option list as a parameter.

ISDN BRI Access to CLASS ACB/AR (continued)

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to ISDN BRI Access to CLASS ACB/AR:

- ISDN ACB and AR are incompatible with the following Multiple Appearance Directory Number (MADN) options: EXB (extension bridging) and MCA (multiple call arrangement). ISDN ACB and AR are compatible with MADN CACH (call appearance call handling) and SCA (single call arrangement).
- ISDN ACB and AR cannot be provisioned on the same line with the following options:
  - — Automatic Line (AUL)
  - — Denied Origination (DOR)
  - — Denied Termination (DTM)
  - — Ring Again (RAG)

For more information on limitations and restrictions for ISDN ACB and AR, refer to “Limitations and restrictions."

SERVORD prompts

The following table shows the SERVORD prompts used to assign options ACB and AR to an ISDN line.

SERVORD prompts for ISDN BRI Access to CLASS ACB/AR (Sheet 1 of 2)

Prompt	Valid input	Explanation
DN_OR_LEN	a logical terminal group name (1 to 8 alphanumeric characters), followed by a space and a terminal number (1 to 1022)	Specifies the LTID that identifies the logical terminal to which the ACB or AR option is being added
OPTKEY	1 to 64	Specifies the number of the key to be assigned the ACB or AR option
OPTION	ACB, AR	Specifies the option to be assigned

SERVORD prompts for ISDN BRI Access to CLASS ACB/AR (Sheet 2 of 2)

Prompt	Valid input	Explanation
BILLING_OPTION	AMA, NOAMA	Indicates the billing option to be specified when SUSP is enabled for the office. Enter AMA if an AMA record should be created; enter NOAMA if an AMA record should not be created.
KEYLIST	1 to 64	Specifies the list of keys available on the terminal (up to 24 keys can be specified)

SERVORD example for adding the ACB option to an ISDN line using the ADO command

The following SERVORD example shows how the ACB option is added to an ISDN line using the ADO command.

SERVORD example for ISDN BRI Access to CLASS ACB/AR in prompt mode

```
> ADO
SONUMBER:  NOW 97 7 9 PM
>
DN_OR_LEN:
> 6215099
OPTKEY:
> 4
OPTION:
> ACB
BILLING_OPTION: NOAMA
> $
KEYLIST:
> $
OPTKEY:
> $
```

SERVORD example for ISDN BRI Access to CLASS ACB/AR in no-prompt mode

```
> ADO $ 6215099 4 ACB $ $ $
```

ISDN BRI Access to CLASS ACB/AR (end)

SERVORD example for deleting the ACB option from an ISDN line using the DEO command

The following SERVORD example shows how the ACB option is deleted from an ISDN line using the DEO command.

SERVORD example for ISDN BRI Access to CLASS ACB/AR in prompt mode

```
> DEO
SONUMBER:  NOW 97 7 9 PM
>
DN_OR_LEN:
> 6215099
OPTKEY:
> 4
OPTION:
> ACB
OPTKEY:
> $
```

SERVORD example for ISDN BRI Access to CLASS ACB/AR in no-prompt mode

```
> DEO $ 6215099 4 ACB $
```

ISDN Calling Number Delivery/Name and Number Privacy

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA012 and up

Prerequisites

To operate, ISDN Calling Number Delivery/Name and Number Privacy has the following prerequisites:

- BAS Generic, BAS00003
- MDC Minimum, MDC00001
- MDC Standard, MDC00003
- RES Service Enablers, RES00006

Network con guration

Common Channel Signaling No. 7 (CCS7) connectivity is required for network (interof ce) con guration of Calling Number Display. The following prerequisites are required for CCS7 connectivity:

- Base ISUP, ISP70001
- TEL CCS7 Base, TEL00008
- BAS Generic, BAS00003

Description

ISDN Calling Number Delivery/Name and Number Privacy allows Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) lines access to

ISDN Calling Number Delivery/Name and Number Privacy (continued)

the following Residential Enhanced Services (RES)/Meridian Digital Centrex (MDC) Calling Number Delivery (CND) and blocking features:

- Caller ID Delivery and Suppression (CIDS) originator-side features
  - — Caller ID Delivery and Suppression Suppression (CIDSSUP), which is Calling Name and Number Blocking (CNNB) in the RES/MDC environment
  - — Caller ID Delivery and Suppression Delivery (CIDSDLV), which is Calling Name and Number Delivery (CNND) in the RES/MDC environment
  - — CIDSSUP and CIDSDLV Universal Access (UA) with Subscriber Usage-Sensitive Pricing (SUSP)
  - — Privacy Change Allowed (PCA)
- Calling Number Identi cation Services (CNIS) terminator-side features
  - — ISDN Calling Number Delivery (CND), including SUSP activation by way of CND activation (CDNA) and CND deactivation (CNDD)

See the “Calling Name Delivery" feature description in this document for description and provisioning of the CNAMD feature.

See the “Calling Number Information Services Uniformity (CNISU)" feature description in this document for information on the NA012 and up of ce parameter CND_BRI_OFFICE, which is another delivery mechanism for CND.

Operation

The following sections describe each of the functionalities included in this activity.

Caller ID Delivery and Suppression (CIDS) features

This feature implements a subset of the CLASS CIDS functionality on the ISDN BRI platform. CIDS features are used by the originating party to deliver or suppress number information to a terminating party that has the ability to receive it. CIDSSUP and CIDSDLV are explicitly assignable as line options on ISDN sets.

CIDS features can be activated of ce- wide by setting the ENABLED eld of tuple CNDB in table RESOFC to Y. Data ll of Y enables these features to be accessed, and data ll of N disables CIDS features in the of ce for all ISDN and non-ISDN platforms. The CNDB tuple must be enabled for CIDSSUP and CIDSDLV to function.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

CIDSSUP

This originator-side feature suppresses, or *blocks*, the calling party's name and number. The feature lasts for the duration of the call. The call originator activates CIDSSUP by dialing an access code or pressing a feature key before dialing a DN. The caller's name and number is suppressed for that call, and is not delivered to the terminating party.

CIDSSUP can be accessed by the following methods, which use RES functionality:

- dial access with UA to the non-ISDN Calling Number Delivery Blocking (CNDB) feature if the CNDB tuple in table RESOFC is set to UNIVER for UA
- dial access with the non-ISDN CNDB feature as a customer group option if the CNNB feature is assigned to the BRI line's customer group

CIDSSUP can also be accessed by the following methods that use ISDN-speci c functionality:

- feature key access with CIDSSUP explicitly assigned to a feature key by the Service Order System (SERVORD)
- dial access with CIDSSUP explicitly assigned as a BRI line option by SERVORD

CIDSDLV

This originator-side feature *delivers* the calling party's name and number. The feature lasts for the duration of the call. The call originator activates CIDSDLV by dialing an access code or pressing a feature key before dialing a DN. The caller's name and number is delivered for that call to the terminating party if the terminating party has an active CND or CNAMD feature on the line.

CIDSDLV can be accessed by the following methods, which use RES functionality:

- dial access with UA to the non-ISDN CNDB feature if the CNDB tuple in table RESOFC is set to UNIVER for UA
- dial access with the non-ISDN CNDB feature as a customer group option if the CNND feature is assigned to the line's customer group

ISDN Calling Number Delivery/Name and Number Privacy (continued)

CIDSDLV can also be accessed by the following methods that use ISDN-speci c functionality:

- feature key access with CIDSDLV explicitly assigned to a feature key by SERVORD
- dial access with CIDSDLV explicitly assigned as a BRI line option by SERVORD

CIDSSUP and CIDSDLV Universal Access with SUSP

The CIDS features can be used by a BRI line through the facilities of Universal Access. UA is a mechanism by which certain CLASS features can be made generally available to an of ce without e xplicit subscription from a DN or customer group. UA for ISDN lines operates identical to the RES UA. Only the CIDSSUP and CIDSDLV features are available through UA.

UA is enabled at the MAP level through Software Optionality Control (SOC). Once activated, the individual UA-capable CLASS features must be switched to use UA in table RESOFC. The CIDSSUP and CIDSDLV features are controlled through the CNDB tuple in table RESOFC. Changing the CNDB tuple from SUBSCR to UNIVER enables UA for CIDSSUP and CIDSDLV. UA allows the subscriber to invoke the features through dial access, similar to a DN option.

SUSP allows billing for the ISDN CIDSDLV feature for each use rather than on a at subscription rate. Of ce-le vel control for SUSP is enabled in table AMAOPTS to allow CIDSDLV and CIDSSUP the ability to generate SUSP billing records. The subscriber dials an activation code to activate delivery of the ISDN SUSP display information.

Calling Number Identi cation Ser vices (CNIS) features

The CNIS features available on the ISDN BRI platform are CND and PCA. CND allows delivery of the originator's calling party number information when a call is placed. PCA allows the operating company to restrict or allow the originator's ability to change the privacy status. CND adds DN level control of calling number display, OMs, and billing to the previous functionality in which the originator's number was always displayed if the CLID (caller ID) option was data lled for the customer group of the terminator in table CUSTNTWK.

CND

This terminator-side feature allows delivery of the caller's name and number if the information is not suppressed. If the information is suppressed by the originator, operating-company data lled te xt, such as OUTSIDE CALL, displays to alert the terminator that the calling number has been suppressed.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Field ENABLED of the CND tuple in table RESOFC must be set to Y for CND to function (controls all CND in the of ce, including the RES/IBN v ersion).

CND can be accessed by the following methods:

- the CLID customer group option in table CUSTNTWK, which displays the calling number according to the type of CLID data lled (ONNET , OFFNET, or PRIVATE) (existing RES functionality)
- as a CND line option, which is always active, and provisioned through SERVORD. It can only be assigned to a DN key, and a separate tuple in table RESFEAT is automatically updated for each DN assigned CND through SERVORD. (ISDN functionality)

Note: If the CND feature is provisioned but inactive and the customer group CLID option is present, delivery occurs by the CLID option.

CND is provisioned in one of the following ways:

- as a at-rate DN option, al ways active (CND NOAMA)
- as a user-activated DN option with SUSP, controlled by options CNDA and CNDD (CND AMA)

CND NOAMA CND is instantly and constantly active at a at-rate when provisioned against a line that has NOAMA speci ed in the BILLING_OPTION eld. The subscriber receives number information (when not suppressed) from the calling party.

CND AMA (SUSP) CND is billed on a user-activated SUSP basis if provisioned against a DN that has the SUSP tuple set to Y in table AMAOPTS and AMA speci ed on that line. Also, the CND option must be pro visoned through SERVORD on a DN with eld BILLING_OPTION set to AMA. When SUSP is assigned, its default setting is INACTIVE. CND must be activated by the user before calling party information is delivered.

When the feature is active, calling number and name information is delivered, and the subscriber is billed accordingly. The CND subscriber is not billed for CND feature usage when the feature is inactive.

PCA

The Privacy Change Allowed feature gives the operating company control to allow or disallow subscriber ability to restrict or allow privacy status changes. The control mechanism is the presentation indicator (PI) in the calling number information element (CGNIE) of the SETUP message from an ISDN BRI originator's set. The PI can be set to allowed or restricted.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

The PI is set by line option PCACIDS, which can be assigned to a set to allow or disallow subscriber control over privacy status. The subscriber can dial a code or press a key to modify the PI of the set.

The default privacy status (at the switch) for a BRI DN is PRESENTATION_ALLOWED, unless the SUPPRESS option is on the line, in which case the status is PRESENTATION_RESTRICTED. The privacy status can be overridden by the activation of the CIDSSUP or CIDSDLV features, which are not affected by PCA.

PCA is assigned to a line in one of the following ways, in increasing order of precedence:

- of ce parameter ISDNBRI_PRIV ACY_CHANGE_ALLOWED in table OFCVAR, which allows or disallows privacy changes for all BRI lines in an of ce
- option PCACIDS assigned to the customer group of the BRI line in table CUSTSTN, which allows or disallows privacy changes for all lines in a customer group
- option PCACIDS assigned to the DN by SERVORD, which allows or disallows privacy changes on that DN. This DN option can be assigned to the primary DN (PDN) of a BRI set only, and a keylist can specify other DNs to which the option applies.

Note: If the subscriber tries to change the privacy status from default and it is disallowed from one of the above mechanisms, the status cannot be changed. No indication is made to the subscriber.

Each of the methods takes a value of yes or no to allow or disallow privacy status changes in the SETUP message. The of ce parameter has the lo west precedence, and only takes effect for a line in the absence of one of the options. The customer group option overrides the of ce parameter, and the line option has the highest precedence.

PCA does not interact with CIDS features. If an originating BRI line invokes a CIDS feature, the privacy status associated with the CIDS feature becomes the line's privacy status for the call.

Q.931 signaling is used to communicate between the ISDN BRI customer premise equipment (CPE) and the DMS switch. An example of a Q.931 SETUP message from an originator follows. The PI used by PCA, in octet 3 of the CGNIE, is highlighted.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Q.931 SETUP message

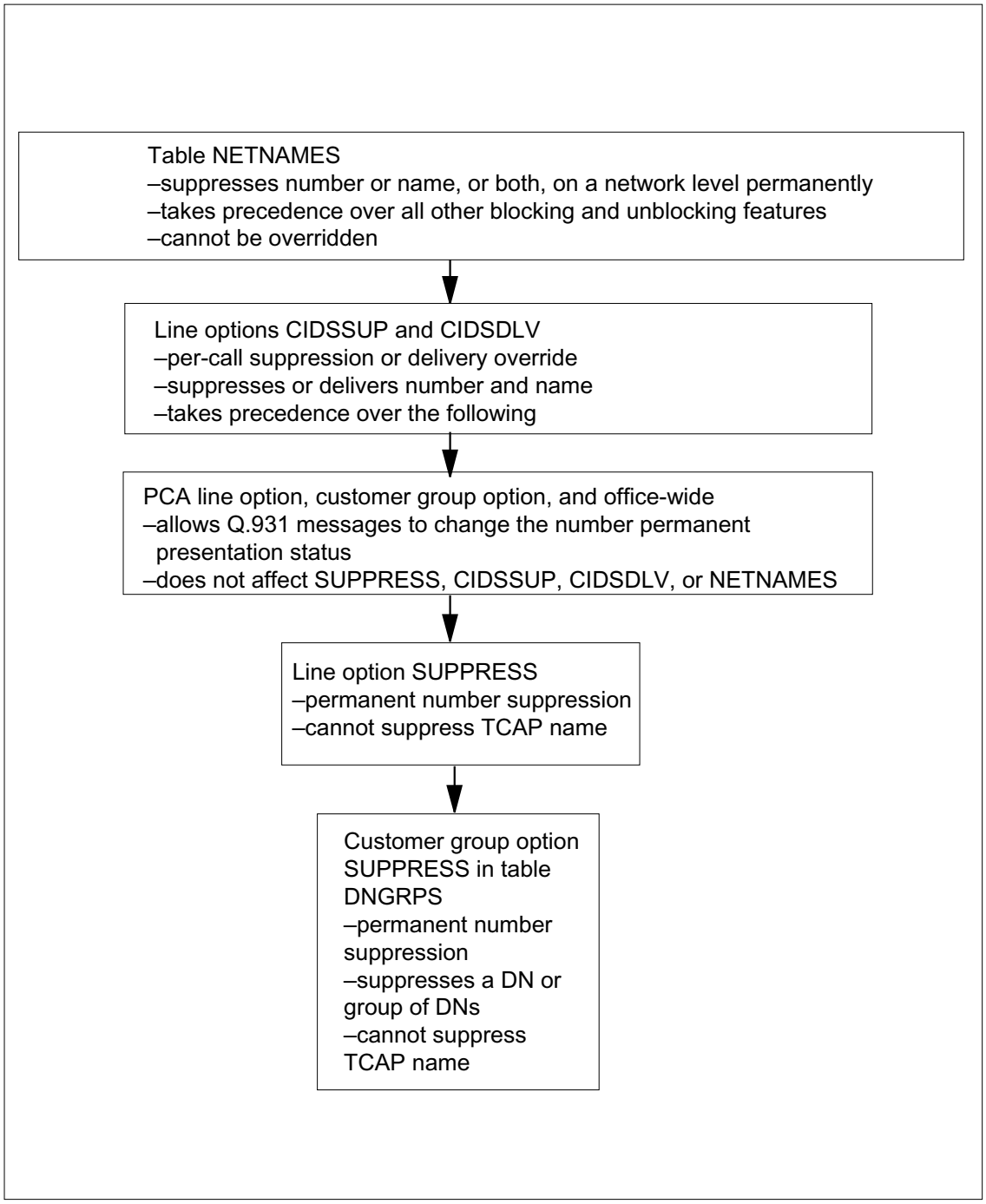
```
==> SETUP
08  01  01  05  04  03  80  90  A2  6C  0C  00  80  36  31  33
36  32  31  31  35  39  33

CR      : 0, 01
BC      : speech
          circuit mode
           mu-law
CGN   : unknown
          presentation allowed of user-provided
number, number not screened
           6136211593
```

The following gure sho ws the order of precedence for all calling name and number display blocking features. Table NETNAMES data ll has the highest precedence, and the SUPPRESS customer group option in table DNGRPS has the lowest.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

ISDN blocking features order of precedence



Translations table o w

The translations tables for CND, CIDSSUP and CIDSDLV, and PCACIDS are described in the following sections.

CND

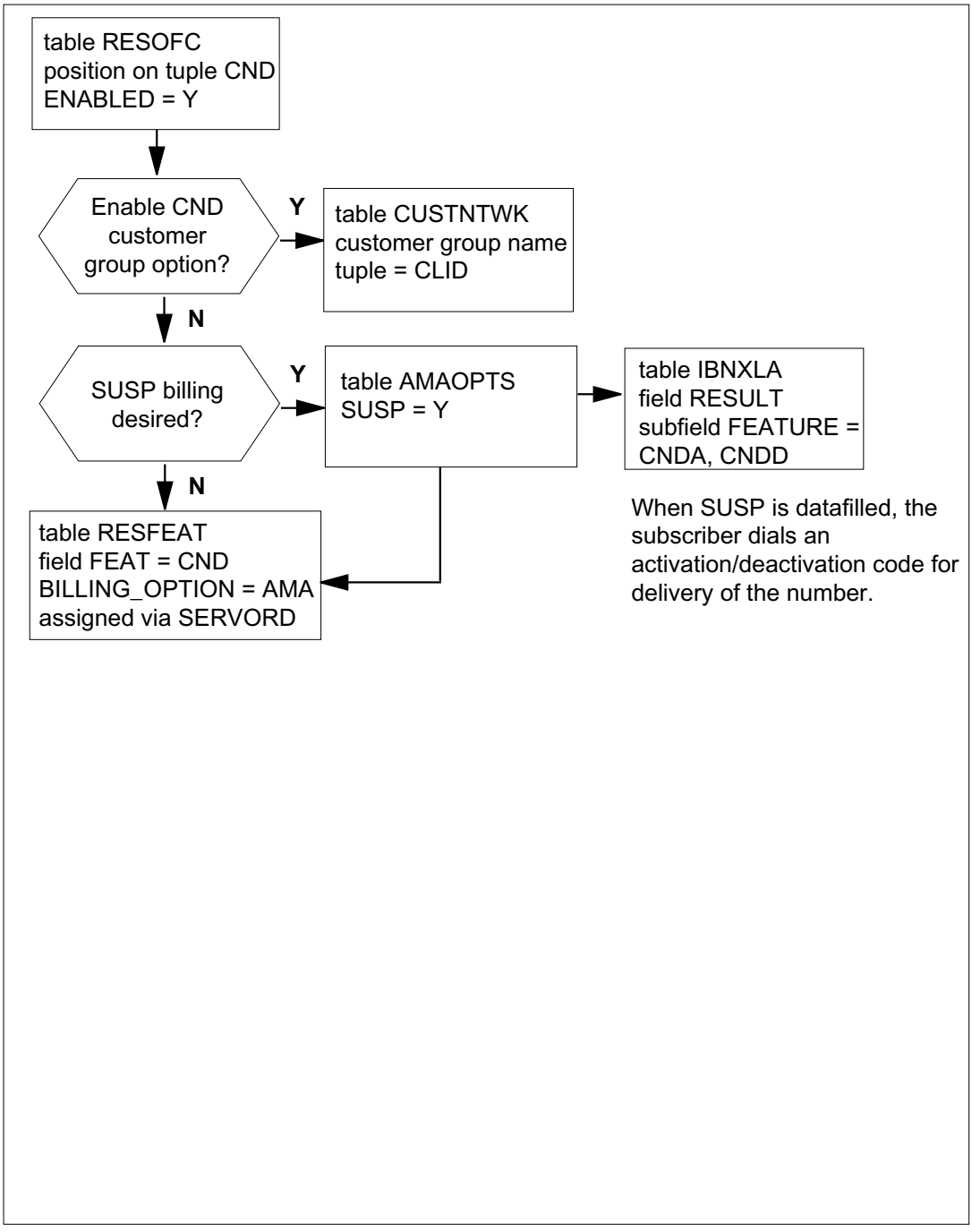
The CND translations tables are described in the following list:

- Table RESOFC controls the UA feature, which controls feature availability for an entire of ce. The ENABLED eld of tuple CND must be data lled with Y to enable CND for the of ce.
- Table CUSTNTWK stores the features that are assignable to a customer group. This table is accessed by the ISDN customer group name tuple, which is data lled with option CLID for the CND functionality .
- Table AMAOPTS is used to control the activation and scheduling of the recording options for automatic message accounting (AMA). Field SUSP is set to Y for subscription usage-sensitive pricing, if applicable.
- Table RESFEAT contains the assignment of CLASS features for residential lines. This table is automatically updated for each DN assigned CND by SERVORD. Field FEAT equals CND, and eld BILLING_OPTION equals AMA, if applicable.
- Table IBNXLA stores the activation codes for CND in a feature translator. Sub eld FEA TURE of the RESULT eld is data lled with CND A and CNDD, and the access codes for each are data lled here. This table is accessed by the translator name and access code for activation and deactivation.

The ISDN CND translation process is shown in the o wchart that follows.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Table o w for ISDN CND



ISDN Calling Number Delivery/Name and Number Privacy (continued)

CIDSSUP and CIDSDLV

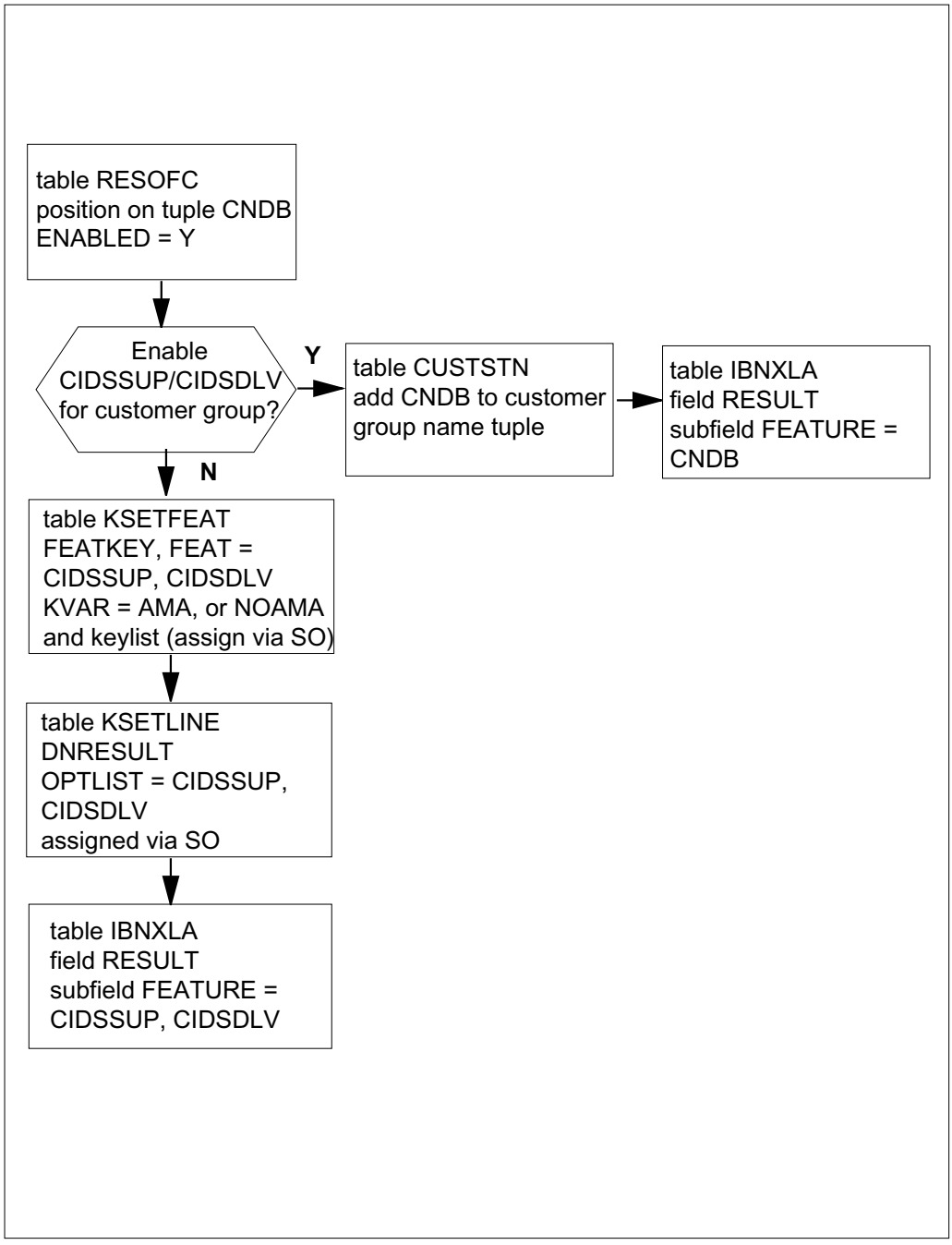
The CIDSSUP and CIDSDLV translations tables are described in the following list:

- Table RESOFC controls the UA feature, which controls feature availability for an entire of ce. The CIDSSUP and CIDSDLV features are controlled through the CNDB tuple of eld EN ABLED. The CNDB tuple must be enabled for CIDSSUP and CIDSDLV to work.
- Table CUSTSTN lists the customer group options assigned to an entire group. This table is accessed by the ISDN customer group name. The CNDB option name and option activate CIDSSUP and CIDSDLV for a customer group.
- Table IBNXLA stores the activation codes for the customer group option CNDB and and line options CIDSSUP and CIDSDLV. It is accessed by the translator name and access code for activation and deactivation.
- Table KSETFEAT lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE. This table is automatically updated when new options are added to a business set by SERVORD. Field FEATKEY, sub eld FEAT, is data lled with CIDSSUP or CIDSDLV. Sub eld FEA TURE is data lled with CIDSSUP or CIDSDLV. Sub eld KV AR either equals AMA, or NOAMA with a keylist.
- Table KSETLINE contains the DN appearances for business sets and data units. One entry is required for each DN-related key on a business set and a data unit. This table is automatically updated when new options are added to a business set by SERVORD. Field DNRESULT, sub eld OPTLIST, is data lled with CIDSSUP or CIDSDL V.

The ISDN CIDSSUP and CIDSDLV translation process is shown in the o wchart that follows.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Table o w for ISDN CIDSSUP and CIDSDLV



ISDN Calling Number Delivery/Name and Number Privacy (continued)

PCACIDS

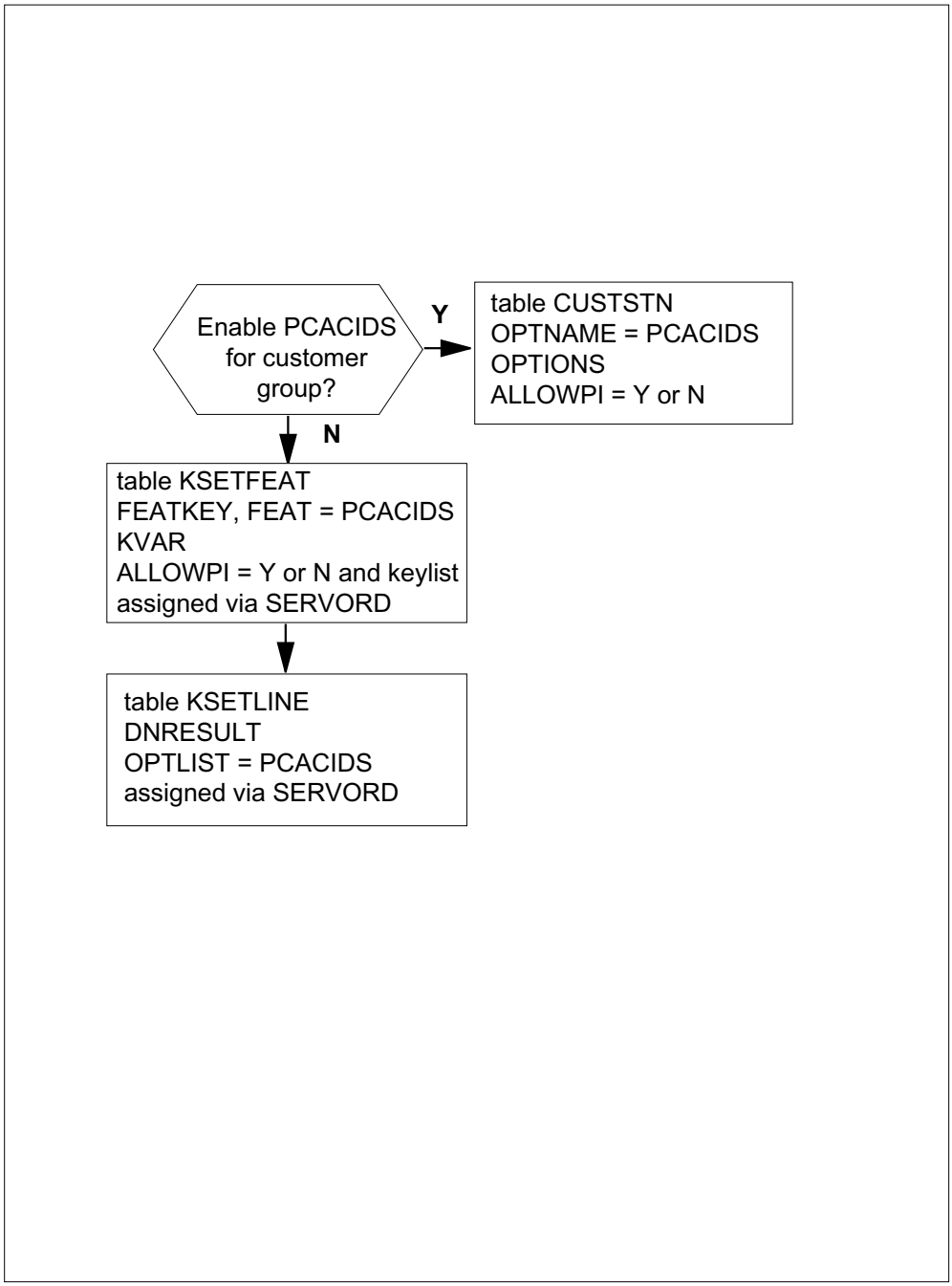
The CIDSSUP and CIDSDLV translations tables are described in the following list:

- Table CUSTSTN lists the customer group options assigned to an entire group. Field OPTNAME is data lled with PCA CIDS, and eld OPTIONS, sub eld ALLO WPI, is set to Y for the customer group. This data ll o verrides the of ce parameter ISDNBRI_PRIVACY_CHANGE_ALLOWED.
- Table KSETFEAT is automatically updated when new options are added to a business set by SERVORD. Field FEATKEY, sub eld FEAT is data lled with PCACIDS. Sub eld FEA TURE is data lled with PCA CIDS. Sub eld KV AR, re nement ALLO WPI, is data lled with Y to allo w subscriber modi cation of the PI, and a k eylist is speci ed.
- Table KSETLINE is automatically updated when new options are added to a business set by SERVORD. Field DNRESULT, sub eld OPTLIST , is data lled with PCA CIDS.

The ISDN PCACIDS translation process is shown in the o wchart that follows.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Table o w for ISDN PCACIDS



ISDN Calling Number Delivery/Name and Number Privacy (continued)

The following table lists the data ll content used in the o wchart.

Data ll e xample for ISDN Calling Number Delivery/Name and Number Privacy

Datafill table	Example data
RESOFC	CND N SUBSCR CND $ CNDB Y UNIVER CNDB $
IBNXLA	CXT1 67 FEAT N N N CIDSSUP CXT1 82 FEAT N N N CIDSDLV CXT1 65 FEAT N N N CNDA CXT1 85 FEAT N N N CNDD
CUSTNTWK	IBNTST PUBLIC 1 $ (CLID OFFNET) $
AMAOPTS	SUSP ON
RESFEAT	ISDN 20 1 CND CND AMA ACT 0 0
RESOFC	CND Y SUBSCR CND SINGLE $CNDB Y SUBSCR CNDB $ $
CUSTSTN	ISDNGRP CNDB CNDBISDNGRP PCACIDS PCACIDS Y
KSETFEAT	ISDN 1 1 CIDSSUP CIDSSUP NOAMA $ISDN 1 1 CIDSDLV CIDSDLV NOAMA $ISDN 1 1 PCACIDS PCACIDS Y $
KSETLINE	CIDSSUPCIDSDLVPCACIDS

Limitations and restrictions

The following limitations and restrictions apply to ISDN Calling Number Delivery/Name and Number Privacy:

- The ISDN Display feature is supported on Protocol Version Control (PVC) Functional Issue 2 terminals only. Both NI-1 and NI-2 terminals are supported.
- ISDN CND is only supported on a DN basis, not on a DN/CT basis. CND cannot be data lled per DN per CT , only per DN.
- ISDN CND does not support inter- and intra- Basic Business Group (BBG) segregation.
- ISDN CND can only be added to a DN key. The CND SUSP option can only be activated and deactivated by an access code. Key activation and deactivation is not allowed.
- CND cannot be added to a Bridged Night Number (BNN) member.
- CND with the AMA option cannot be assigned to lines with Denied Origination (DOR) or Automatic Line (AUL).

ISDN Calling Number Delivery/Name and Number Privacy (continued)

- CND cannot be added through a feature group.
- CND is incompatible with the ISDN option BLOCKCGN.
- Abbreviated Number Delivery (AND) and Redirecting Number Delivery (RND) are not supported.
- CND cannot be added to a secondary Multiple Appearance DN (MADN) single call arrangement (SCA) member. CND cannot be assigned to a non-primary Call Appearance Call Handling (CACH).
- The initial state of CND with SUSP is inactive. To change the state to active, activate CND with the CNDA activation code.
- The extended I-CND parameter that allows the subscriber to control delivery of the calling party number based on its intra- or inter-BBG status is not supported.
- The extended format of the PCA parameter that allows the subscriber to control privacy changes on an intra- or inter-BBG status is not supported.
- CND deactivation and reactivation using a feature key is not supported.
- No AMA records are produced for the PCA feature.
- This feature does not support Bellcore requirements for ISDN uniform display.
- The PCA parameters only control acceptance of the PI in the originating SETUP message, not CIDSSUP and CIDSDLV. PCA and CIDSSUP/CIDSDLV are mutually exclusive.

Interactions

The following paragraphs describe the interactions between ISDN Calling Number Delivery/Name and Number Privacy and other functionalities.

Additional Call Offering (ACO)

When CND is active for all calls incoming to a BRI line with ACO, the CGN is delivered in the noti cation SETUP message. When CND is inacti ve, the CGN is not delivered. Calling number privacy, based on the CIDS and PCA features, is honored in the SETUP message as part of the ACO noti cation. These interactions are supported for both the NI-1 and NI-2 versions of ACO.

Electronic Key Telephone Service (EKTS)--CND

ISDN only supports the MADN single call appearance (SCA) version of EKTS. CND is assignable to the primary member of a MADN SCA group only. CND is not allowed on secondary members of a MADN group, and provisioning CND on IBN secondary members remains unchanged.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

When a call comes in to the MADN group, group members display the originator's number only if the primary group member has CND provisioned and activated on its set. If the primary member has CLASS CND provisioned and active, then delivery occurs for all secondary members, provided the originator's number is not suppressed. If CND is not present and active on the primary member's set, then all secondary group members receive an OUTSIDE CALL indication, instead of the caller's number.

The LCC of the primary member is irrelevant. As long as the primary member has CLASS CND, the secondary members follow suit. Group members also deliver the number if the CLID option is present for the customer group, which applies to the entire MADN group.

Secondary group members are also able to activate or deactivate the AMA on CLASS CND if it is provisioned on the primary member. The LCC of the primary is irrelevant.

Electronic Key Telephone Service (EKTS)--CIDS

Unlike CND, CIDSSUP and CIDSDLV are provisionable on each individual ISDN member of the MADN SCA group. Each member can suppress or allow delivery of its number on origination by dialing the feature access code or pressing the feature key.

The provisioning of the primary member is irrelevant for CIDS. The member that attempts activation must have the feature provisioned against its DN. In the case of SCA, no other members can originate while one member is currently involved in a call, so there are no interactions between members with multiple originations.

ISDN Call Forwarding

The base DN for an ISDN Call Forwarding (CFW) subfeature can also subscribe to CND. If “Reminder Noti cation Sent to Base DN" is an ISDN CFW noti cation parameter , the calling party number is delivered to the forwarding party when CND is active on the line. The privacy status of the calling party is still honored, so no digits are delivered if the CGN is indicated private.

Call Forward Universal (CFU), Call Forward Busy (CFB), Call Forward Fixed (CFF)

If the CND subscriber has CFU, CFB, or CFF activated, no CGN is delivered since the call is not answered at the base station. If a call is forwarded to a CND subscriber, the originator's calling party information is delivered to the remote station. If the remote station does not subscribe to CND, no calling number information is included in the SETUP message to the remote station.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

If the ISDN originator activates CIDSSUP and then dials a DN that is forwarded, the CGN delivered to the remote station is marked *private* and *no* CGN digits are delivered. If the ISDN originator activates CIDSDLV and then dials a DN that is forwarded, the CGN delivered to the remote station is marked *public* and the CGN digits are delivered.

If the ISDN originator subscribes to PCA and sends a PI of private in the originating SETUP message, the CGN delivered to the remote station is marked private and no CGN digits are delivered.

Call Forward Don't Answer (CFD)

If the CND subscriber has CFD activated, the calling number is delivered to the base station. When the call is not answered within the speci ed time, the call is forwarded to the remote station. If the remote station subscribes to CND, the originator's calling party information is delivered. If the remote station does not subscribe to CND, no calling number information is included in the SETUP message to the remote station.

If the ISDN originator activates a privacy feature and then calls a CND subscriber that has CFD activated, the calling number information delivered to the CND subscriber is marked *public* or *private* based on the privacy feature invoked. When the call is not answered and forwards, the remote station that subscribes to CND receives the same calling number information as the base station.

ISDN Multiline Hunt Group

CND is assignable to hunt group members on an individual basis. Each member's display is controlled individually. A member's action to deactivate or reactivate CND affects only that member's number display.

ISDN PCA

The ISDN PCA mechanisms are separate from the CIDS features (CIDSSUP and CIDSDLV). PCA only allows or disallows changes to the default privacy status for a BRI line. If the originating BRI line subsequently invokes one of the CIDS features, the privacy status associated with the CIDS feature used becomes the BRI line's privacy status for the call.

Activation of CIDSSUP and CIDSDLV by the end user

The CIDS features can be activated by an originating ISDN BRI subscriber either by dial access or feature key, depending on which is provisioned.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Dial access activation is used when CIDS is provisioned by

- UA to CIDSSUP and CIDSDLV
- customer group option CNDB
- line options CIDSSUP and CIDSDLV

If CIDSSUP is provisioned on the PDN, the subscriber activates the feature by dialing the CIDSSUP activation code. This forces the privacy status for that call to PRESENTATION_RESTRICTED, and the name and number of the originator are not displayed on any terminating equipment capable of display. If the CNDB tuple in table RESOFC is data lled with A CCESS = UNIVER, then CIDSSUP is available universally by way of activation code without explicit provisioning.

If CIDSDLV is provisioned on the PDN, the subscriber activates the feature by dialing the CIDSDLV activation code. This forces the privacy status for that call to PRESENTATION_ALLOWED, and the name and number of the originator are displayed on any terminating equipment capable of display. If the CNDB tuple in table RESOFC is data lled with ACCESS = UNIVER, then CIDSDLV is available universally by way of activation code without explicit provisioning.

Feature key activation is used when CIDS is provisioned by ISDN BRI feature key options CIDSSUP and CIDSDLV. If CIDS is not provisioned for use by the subscriber attempting to invoke it, an error treatment is given.

Activation of CIDS by dial access by the end user

At the originator's telephone

1 Go off-hook.

Response:

Dial tone

2 Dial the appropriate access code (either for CIDSSUP or CIDSDLV).

Response:

Recall dial tone is returned.

3 Place a call, and the appropriate privacy status on the calling party information is given.

Response:

If you dialed the CIDSSUP access code, the terminator cannot view your name or number. If you dialed the CIDSDLV access code, your name and number is delivered to the terminator.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Activation of CIDS by feature key access by the end user

At the originator's telephone

1 Go off-hook.

Response:

Dial tone

2 Press the appropriate feature key.

Response:

Recall dial tone is returned.

3 Place a call, and the appropriate privacy status on the calling party information is given.

Response:

If you pressed the CIDSSUP feature key, the terminator cannot view your name or number. If you pressed the CIDSDLV feature key, your name and number is delivered to the terminator.

Activation/deactivation of CND by the end user

CND SUSP (AMA) can be activated and deactivated by the end user. First, the SUSP tuple in table AMAOPTS must be set to Y. Then, the CND option must be provisioned by SERVORD on a BRI DN with eld BILLING_OPTION set to AMA. The CNDA and CNDD access codes are used to activate and deactivate the feature when provisioned this way. When CND SUSP is rst assigned it is inactive and must be activated by dialing the CNDA code.

Note: If an ISDN BRI subscriber attempts to dial the CNDA or CNDD access codes without CND SUSP properly provisioned for the DN, an error treatment is given.

Activation of CND by the end user

At the CND subscriber's telephone

1 Go off-hook.

Response:

Dial tone

2 Dial the CNDA feature access code.

Response:

Con r mation tone is returned.

3 Go on-hook.

Response:

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Calling party name and number information is received when a call is placed to the DN with the CND feature. You are billed for the feature each time a number is delivered to your set.

Deactivation of CND by the end user

At the CND subscriber's telephone

1 Go off-hook.

Response:

Dial tone

2 Dial the CNDD feature access code.

Response:

Con r mation tone is returned.

3 Go on-hook.

Response:

Calling party name and number information is *no*t received when a call is placed to the DN with the CND feature. You are not billed for the feature while it is inactive.

Billing

The following AMA records are produced for CND and CIDSDLV:

- structure code 110, call code 264, feature code 080

  This is an existing CLASS billing record, produced for SUSP CND and for lines that have both SUSP CND and SUSP CNAMD assigned if the of ce parameter ISDNBRI_CNAMD_CND_ONE_AMA is set to N.

- structure code 1030, call code 330, feature code 085

  This is a new AMA record produced for successful subscriber UA and CIDSDLV line option activations of SUSP CIDSDLV.

CND

An existing AMA Bellcore format record with structure code 110, call code 264, and feature code 080 is produced under the following circumstances:

- for each CLASS SUSP display subscriber as scheduled in the CIDSUSPAUD entry of table AMAOPTS
- when a CLASS display feature assigned to a subscriber's line is removed from SUSP
- when a CLASS SUSP display feature assigned to a subscriber's line is changed from SUSP

ISDN Calling Number Delivery/Name and Number Privacy (continued)

- when one or more SUSP features are removed from a line
- when a line that had CLASS SUSP display features is deleted

Execute the CIDSUSPAUD audit at least once a day to produce the records for all CLASS SUSP display subscribers. Each record provides the calling information available and unavailable counts for the CLASS SUSP display features assigned to a subscriber line.

The following conditions must be met for this AMA record to be produced:

- The Bellcore AMA package is in the of ce.
- SUSP billing is enabled in table AMAOPTS.
- CNAMD and CND with AMA are assigned to a line.
- CNAMD and CND are enabled in table RESOFC.
- CNAMD and CND are enabled on the subscriber's line.
- The CIDSUSPAUD entry in table AMAOPTS is scheduled.
- The of ce parameter ISDNBRI_CN AMD_CND_ONE_AMA in table OFCENG is set to N. (The value of N indicates that separate AMA records are required for CND and CNAMD.)

The billing record includes the AVAIL and UNAVAIL counts of CND. The peg counts for the CND feature are reported as follows:

- The AVAIL count stores the number of times that a calling number was delivered to the subscriber.
- The UNAVAIL count stores the number of times that out-of-area or private was delivered.

The following gure is an example of an AMA record generated for call code 264.

Call code 264

```
HEX ID: AA STRUCTURE CODE:40110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C CLASS FEATURE:080C DATE:92519C CONNECT
TIME:1049386C NPA:819C DIR NUMBER:6221999C AVAIL
COUNT:000026C UNAVAIL COUNT:000005C
```

ISDN Calling Number Delivery/Name and Number Privacy (continued)

CIDSDLV

A new AMA record is produced for successful subscriber UA and CIDSDLV line option activations of SUSP CIDSDLV. Because the non-ISDN CLASS CIDSDLV feature (which is CNND) does not produce an AMA record on activation, ISDN Calling Number Delivery/Name and Number Privacy creates this Bellcore format AMA billing record for each successful SUSP CIDSDLV activation by a subscriber. This record is produced for an *ISDN* CIDSDLV activation only. (Customer group activation by option CNDB in table CUSTSTN does not produce it.)

An existing AMA Bellcore format record with structure code 1030, call code 330, and feature code 085 is produced for each successful subscriber activation of SUSP CIDSDLV.

The following conditions must be met for this AMA record to be produced:

- The Bellcore AMA package is in the of ce, and the of ce is con gured for Bellcore AMA format records.
- SUSP billing is enabled in table AMAOPTS.
- CIDSDLV is available in the of ce.
- CIDSDLV AMA is assigned to the line, or CIDSDLV is activated by UA on an ISDN line with no CIDSDLV line option or CIDSDLV customer group option.

The following gure is an example of an AMA record generated for call code 330.

Note: The elapsed time is zero because this record bills for usage of a subscriber feature, not for a toll call. The connect time is the time at which the billing record is generated.

Call code 330

```
*HEX ID:AA STRUCTURE CODE:01030C CALL CODE:330C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C DATE:60819C CLASS FEATURE:085C ORIG
NPA:613C ORIG NUMBER:6215015C OVERSEAS IND:1C TERM
NPA:00613C TERM NUMBER:6215010C CONNECT TIME:1514376C
ELAPSED TIME:000000000C CLASS FUNCTION:000C FEATURE
STATUS:000C SCRN LIST SCF:FFFF SCRN LIST SCR:FFFF SCRN
LIST DRCW:FFFF
```

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Station Message Detail Recording

ISDN Calling Number Delivery/Name and Number Privacy does not affect Station Message Detail Recording.

Data lling of ce parameter s

The following table shows the of ce parameters used by ISDN Calling Number Delivery/Name and Number Privacy. For more information about of ce parameters, refer to *Office Parameters Reference Manual.*

Of ce parameter s used by ISDN Calling Number Delivery/Name and Number Privacy

Table name	Parameter name	Explanation and action
OFCENG	ISDNBRI_CNAMD_CND_ONE_AMA	This office parameter gives the operating company the flexibility of generating one or two AMA records when both CND and CNAMD are assigned on a SUSP basis and both features are active. When set to YES, one AMA record is generated. The default is N.
OFCVAR	ISDNBRI_PRIVACY_CHANGE_ALLOWED	This office parameter controls whether the use of the Presentation Indicator (PI) in the ISDN SETUP message is allowed or disallowed use by the subscriber. If set to Y, the subscriber can modify the privacy status with the PI in the SETUP message. If set to N, the subscriber cannot modify the privacy status with the PI. The default is N. The office parameter value can be overridden by the customer group option PCACIDS and the line option PCACIDS.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Data ll sequence

The following table lists the tables that require data ll to implement ISDN Calling Number Delivery/Name and Number Privacy. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for ISDN Calling Number Delivery/Name and Number Privacy (Sheet 1 of 2)

Table	Purpose of table
OFCENG	Office Engineering. This table contains data on engineering parameters for the office. Refer to “Datafilling office parameters" for how CND and CNAMD affect office parameters.
OFCVAR	Office Variable. This table contains data on variable parameters for the office. Refer to “Datafilling office parameters" for how PCA affects office parameters.
RESOFC	Residential Line CLASS Office Data. This table contains data on CLASS features and enables them for the office. CND is enabled in the CND tuple for the office. CIDSSUP and CIDSDLV are enabled in the CNDB tuple for the office.
IBNXLA	IBN Translation. This table stores data for the digit translation of calls from an IBN station, attendant console, incoming IBN trunk group, or incoming side of a two-way IBN trunk group. Feature translators CNDA and CNDD store the access code for CND. Feature translators CIDSSUP and CIDSDLV store the access codes for CIDSSUP and CIDSDLV.
CUSTNTWK	Customer Group Network. This table stores the features that are assignable to a customer group. The ISDN customer group name tuple is datafilled with CLID to assign CND to a customer group.
AMAOPTS	Automatic Message Accounting Options. This table is used to control the activation and scheduling of the recording options for AMA. SUSP is enabled for CND and CIDSDLV, if applicable.
RESFEAT (note)	Residential Enhanced Services Features. This table contains the assignment of CLASS features for residential lines. This table is automatically updated for each DN assigned CND by SERVORD. The billing option is assigned here.
CUSTSTN	Customer Group Station Option. This table is required for a switching unit with North American translations and Meridian Digital Centrex (MDC) or RES. This table lists the station options assigned to each customer group. The ISDN customer group name tuple is datafilled with CNDB to assign CIDSSUP and CIDSDLV to a customer group, and with PCACIDS to assign PCA.
Note: This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.	

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Data ll tab les required for ISDN Calling Number Delivery/Name and Number Privacy (Sheet 2 of 2)

Table	Purpose of table
KSETFEAT (note)	Business Set and Data Unit Feature. This table lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE, and also the Meridian digital telephone sets and DUs listed in table IVDINV. This table is automatically updated when new options are added to a business set by SERVORD. The line options CIDSSUP, CIDSDLV, and PCACIDS are datafilled here.
KSETLINE (note)	Business Set and Data Unit Line Assignment. This table contains the DN appearances for business sets and data units. One entry is required for each DN-related key on a business set and a data unit. This table is automatically updated when new options are added to a business set by SERVORD. The line options CIDSSUP, CIDSDLV, and PCACIDS are datafilled here.
Note: This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.	

Data lling tab le RESOFC

The following table shows the data ll speci c to ISDN Calling Number Delivery/Name and Number Privacy for table RESOFC. Only those elds that apply directly to ISDN Calling Number Delivery/Name and Number Privacy are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le RESOFC (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
KEY		see subfield	*Key.* This field consists of subfield FEATNAME.
	FEATNAME	CNDB, CND	*Class feature name.* This field is the key to the table. Enter CNDB (for the CIDSSUP and CIDSDLV features) or CND (for the CND feature).
ENABLED		Y or N	*Enabled.* Enter Y (yes) to specify that the feature is enabled within the office. Enter N (no) to indicate the feature is disabled.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Data lling tab le RESOFC (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	ACCESS	SUBSCR or UNIVER	*Feature access.* This field determines who can access the feature. Enter SUBSCR for subscribers only. Enter UNIVER for all residential (RES) line access to the feature.
FEATDATA		see subfield	*Feature data.* This field consists of subfield FEATNAME.
	FEATNAME	CND, CNDB	*Class feature name.* Enter CND for the CND feature and datafill refinement CND_MSGTYPE. Enter CNDB for the CNDB feature and datafill refinements ANNCS, CNDBANNC, and ANNCCLLI.
	CND_ MSGTYPE	SINGLE or MULTIPLE	*CND message type.* Enter whether the data message format sent to the CPE is single or multiple.
	ANNCS	see subfields	*Announcement.* This field consists of subfields CNDBANNC and ANNCCLLI.
	CNDBANNC	CNDBCONF	*CNDB announcement.* Enter CNDBCONF for CNDB confirmation.
	ANNCCLLI	alphanumeric (1 to 16 characters)	*Announcement common language location identifier.* Enter the announcement CLLI datafilled in tables CLLI, ANNS, ANNMEMS, and DRAMTRK for CNDB confirmation.

Data ll e xample for table RESOFC

The following example shows sample data ll for table RESOFC.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

MAP display example for table RESOFC

```
KEY          ENABLED          FEATDATA          FNALANN
-------------------------------------------------------
CND           N               SUBSCR CND          $
CNDB          Y               UNIVER CNDB         $
```

Data lling tab le IBNXLA

The following table shows the data ll speci c to ISDN Calling Number Delivery/Name and Number Privacy for table IBNXLA. Only those elds that apply directly to ISDN Calling Number Delivery/Name and Number Privacy are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le IBNXLA (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
KEY		see subfields	*Key.* This field consists of subfields XLANAME and DGLIDX.
	XLANAME	alphanumeric (1 to 8 characters)	*Translator name.* Enter the name that is assigned to the translator.
	DGLIDX	vector of up to 18 digits	*Digilator index.* Enter the digit or digits assigned as an ambiguous code. The range of this field depends on field MAXDIG in table XLANAME. The DGLIDX can accept overdecadic digits. The allowable values for the digilator portion of DGLIDX of table IBNXLA are as follows: MAXDIG value — IBNXLA digilator values 9 — digits 0 to 9 C — digits 0 to 9 and B to C F — digits 0 to 9 and B to F The allowable digit range for table IBNXLA digilator values is determined for each translator.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Data lling tab le IBNXLA (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
RESULT		see subfields	*Result.* This field consists of subfields TRSEL, ACR, SMDR, and FEATURE.
	FEATURE	CNDA, CNDD, CIDSSUP, CIDSDLV	*Feature.* Enter the name of the feature to be accessed when the digits are dialed. Enter CNDA for CND activation. Enter CNDD for CND deactivation. Enter CIDSSUP for CIDSSUP and CIDSDLV for CIDSDLV.

Data ll e xample for table IBNXLA

The following example shows sample data ll for table IBNXLA.

MAP display example for table IBNXLA

```
KEY         RESULT
-------------------------------------------------------
CXT1  67    FEAT N N N CIDSSUP
CXT1  82    FEAT N N N CIDSDLV
CXT1  65    FEAT N N N CNDA
CXT1  85    FEAT N N N CNDD
```

Data lling tab le CUSTNTWK

The following table shows the data ll speci c to ISDN Calling Number Delivery/Name and Number Privacy for table CUSTNTWK. Only those elds that apply directly to ISDN Calling Number Delivery/Name and Number

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Privacy are shown. For a description of the other elds, refer to the data schema section of this document.

Note: If the customer group does not have feature AG0981 (Network Dial Plan Display), data ll the follo wing elds.

Data lling tab le CUSTNTWK

Field	Subfield or refinement	Entry	Explanation and action
OPTIONS		see subfields (up to 13 multiples)	*Options* This field consists of subfield OPTION and refinements.
	OPTION	CLID	*Option* This subfield lists options assigned to the customer group. Enter CLID for option CLID, which assigns the feature BT0072 (Calling Line Identification, or CND) to a RES or ISDN customer group.
	CLIDOPT	INTRAGRP, ONNET, or OFFNET	*CLID option* Enter INTRAGRP to indicate option CLID is available only to terminating agents in the same customer group as the originating agent. Enter ONNET to indicate option CLID is enabled on calls originating in the same network as option CLID that is associated with the called party. Enter OFFNET to indicate option CLID is enabled on all networked calls, regardless of their origin. ***Note:*** Tuple KSET_INTER_GRP_DISP of table OFCENG overrides the value in subfield CLIDOPT. Tuple KSET_INTER_GRP_DISP of table OFCENG must be set to N for the value in subfield CLIDOPT to take precedence.

Data ll e xample for table CUSTNTWK

The following example shows sample data ll for table CUSTNTWK.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

MAP display example for table CUSTNTWK

```
CUSTNAME     NETNAME     NETCGID     DNREVXLA      OPTIONS
-----------------------------------------------------------
IBNTST       PUBLIC       1           $          (CLID
OFFNET) $
```

Data lling tab le AMAOPTS

The following table shows the data ll speci c to ISDN Calling Number Delivery/Name and Number Privacy for table AMAOPTS. Only those elds that apply directly to ISDN Calling Number Delivery/Name and Number Privacy are shown. For a description of the other elds, refer to the data schema section of this document.

Note: Option SUSP can be activated for CND and CIDSDLV. The CIDSUSPAUD option is necessary for billing.

Data lling tab le AMAOPTS (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
OPTION		see subfield	*Option.* This field consists of subfield AMAOPT.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Data lling tab le AMAOPTS (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	AMAOPT	CIDSUSPAUD	*AMA option.* This option controls the calling information delivery (CID) SUSP audit that generates a billing record (for each CND, DDN, or CNAMD feature subscriber) that contains peg counts for each of the CLASS SUSP display options.
		SUSP	If option SUSP is OFF (the default) • no SUSP billing occurs • SERVORD prompting for SUSP is suppressed If option SUSP is ON • SERVORD prompting for BILLING_OPTION is enabled • SUSP billing is enabled for the office (and SUSP billing takes place on lines that have the AMA BILLING_OPTION)

Data ll e xample for table AMAOPTS

The following example shows sample data ll for table AMAOPTS. CND can be provisioned for at-rate or subscription use by the CND option. If SUSP is ON in table AMAOPTS and the operating company speci es AMA when assigning CND, ISDN CND is set up as a SUSP option, and access codes CNDA and CNDD are used to activate and deactivate the feature.

MAP display example for table AMAOPTS

```
OPTION            SCHEDULE
-------------------------------------------------------
SUSP               ON
```

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Data lling tab le CUSTSTN

The following table shows the data ll speci c to ISDN Calling Number Delivery/Name and Number Privacy for table CUSTSTN. Only those elds that apply directly to ISDN Calling Number Delivery/Name and Number Privacy are shown. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le CUSTSTN

Field	Subfield or refinement	Entry	Explanation and action
CUSTNAME		alphanumeric (1 to 16 characters)	*Customer group name.* Enter the customer group name.
OPTNAME		PCACIDS, CNDB	*Option name.* Enter the name assigned to the option, PCACIDS (for the PCACIDS feature) or CNDB (for the CIDSSUP and CIDSDLV features).
OPTION		see subfield	*Option.* This field consists of subfield OPTION.
	OPTION	PCACIDS, CNDB	*Option.* Enter the name assigned to the option, PCACIDS or CNDB. For option PCACIDS, datafill the following refinement.
		Y or N	*Allow PI.* Enter Y if the originators in the customer group are allowed to change the default privacy status by way of the PI in the CGNIE of the SETUP message. Enter N if the originators are denied control over privacy status. This option applies to PCA only.

Data ll e xample for table CUSTSTN

The following example shows sample data ll for table CUSTSTN.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

MAP display example for table CUSTSTN

```
TABLE: CUSTSTN

CUSTNAME OPTNAME OPTION
_____________________________________________________________
ISDNGRP PCACIDS PCACIDS Y
ISDNGRP CNDB CNDB
```

Translation veri cation tools

ISDN Calling Number Delivery/Name and Number Privacy does not use translation veri cation tools.

SERVORD

CIDSSUP and CIDSDLV can be added to feature keys on a set using SERVORD. The feature key can be used by all DNs on the set or by a speci ed subset of DNs. They can also be added as DN key options, assignable to the PDN of the set. The features can be accessed by all DNs on the set, or a speci ed subset. Option PCA CIDS must be assigned to the PDN, but the functionality can apply to a subset of all the DNs.

The CIDSSUP and CIDSDLV options can be assigned either when a new line is being established using the NEW command or afterward using the ADO command. They can be deleted from the PDN or feature key using the DEO or OUT command. PCACIDS can be deleted using the DEO command. If the line is removed using the OUT command, the option is automatically deleted.

The billing option and keylists associated with the CIDSSUP and CIDSDLV options can be changed with the CHF command. The value of the ALLOWPI parameter can be changed with the CHF command.

The CND option can only be added to a PDN or secondary DN key. For each DN assigned CND, there is a separate tuple in table RESFEAT.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to ISDN Calling Number Delivery/Name and Number Privacy:

- The BNN option is incompatible with CIDSSUP.
- The AUL and DOR options are incompatible with options CIDSSUP and CIDSDLV if AMA is set to ON.
- Options CIDSSUP, CIDSDLV, and PCACIDS apply to the line class code of ISDNKSET only.

SERVORD prompts

The following table shows the SERVORD prompts used to add ISDN Calling Number Delivery/Name and Number Privacy to an ISDN BRI set.

SERVORD prompts for ISDN Calling Number Delivery/Name and Number Privacy

Prompt	Valid input	Explanation
ALLOWPI	Y or N	Specifies whether the PI can be used to change the ISDN SETUP message
DN	7 or 10 digits (with no spaces or hyphens)	Specifies the DN
OPTKEY	1 to 69	Indicates the feature key on the ISDN BRI set associated with the option (key 1 is the PDN)
OPTION	CND,CIDSSUP, CIDSDLV, PCACIDS	Specifies the option or options associated with a service to be established, modified, or deleted. A maximum of 20 options can be specified in a single command.
BILLING_OPTION	AMA or NOAMA	Allows billing to be turned on or off, if SUSP is set to ON in table AMAOPTS. This prompt does not appear if SUSP is set to OFF. NOAMA is the default.
KEYLIST	Any list of 1 or more valid DN keys, or $ to indicate all DN keys (1-69)	Specifies a list of DN keys on the terminal to which the feature applies. Up to 24 keys can be specified.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Note: For each DN assigned CND by SERVORD, a separate tuple in table RESFEAT is automatically updated. For each business set assigned option CIDSSUP, CIDSDLV, and PCACIDS, a tuple in tables KSETFEAT and KSETLINE is automatically updated.

SERVORD example for adding ISDN Calling Number Delivery/Name and Number Privacy

The following example shows how the CIDSSUP option is added to an existing PDN using the ADO command. The functionality applies to all the DNs on the set because keylist is data lled with $.

Example of the CIDSSUP option in prompt mode

```
> ADO
SONUMBER:  NOW 96 7 1 PM
>
DN:
> 6755000
OPTKEY:
> 1
OPTION:
> CIDSSUP
BILLING_OPTION: NOAMA
> AMA
KEYLIST:
> $
OPTKEY:
> $
```

Example of the CIDSSUP option in no-prompt mode

```
>ADO  6755000  1  CIDSSUP  AMA  $  $
```

The following example shows how the CIDSDLV option is added to an existing PDN using the ADO command. The functionality applies to all the DNs on the set because keylist is data lled with $.

ISDN Calling Number Delivery/Name and Number Privacy (continued)

Example of the CIDSDLV option in prompt mode

```
> ADO
SONUMBER:  NOW 96 7 1 PM
>
DN:
> 6755000
OPTKEY:
> 1
OPTION:
> CIDSDLV
BILLING_OPTION: NOAMA
> AMA
KEYLIST:
> $
OPTKEY:
> $
```

Example of the CIDSDLV option in no-prompt mode

```
>ADO 6755000 1 CIDSDLV AMA $ $
```

The following example shows how the PCACIDS option is added to an existing PDN using the ADO command. The functionality applies to all the DNs on the set because keylist is data lled with $.

Example of the PCACIDS option in prompt mode

```
> ADO
SONUMBER:  NOW 96 7 1 PM
>
DN:
> 6755000
OPTKEY:
> 1
OPTION:
> PCACIDS
ALLOWPI:
> Y
KEYLIST:
> $
OPTKEY:
> $
```

ISDN Calling Number Delivery/Name and Number Privacy (end)

Example of the PCACIDS option in no-prompt mode

```
>ADO 6755000 1 PCACIDS Y $ $
```

The following example shows how the CND option is added to a secondary DN. The SUSP entry in table AMAOPTS is set to off, so the ADO option does not prompt for the parameter BILLING_OPTION.

Example of the CND option

```
>ADO
SONUMBER:  NOW 96 10 31 PM
>
DN_OR_LEN:
> ISDN 20
OPTKEY:
> 2
OPTION:
> CND
OPTKEY:
> $
```

Example of the CND option in no-prompt mode

```
>ADO ISDN 20 2 CND $
```

ISDN Packet Shared DN

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA010 and up

Prerequisites

To operate, ISDN Packet Shared DN has the following prerequisites:

- ISDN Packet Shared DN permits the sharing of a directory number (DN) with different call types over multiple terminals on the DMS-100 switch. ISDN Packet Shared DN includes the functionality of the following features:
  - — ISDN Packet SERVORD Commands for Shared DN
  - — ISDN Packet Query Commands for Shared DN
  - — ISDN Packet Table Control for Shared DN
  - — ISDN Packet DNCT CPID Base
- Feature NI-1/NI-2 Interface Identi cation pro vides the DMS-100 switch the capability to identify and restrict National ISDN 1 (NI-1) and National ISDN 2 (NI-2) terminal interfaces.

Description

The ISDN Packet Shared DN feature is controlled by Software Optionality Control (SOC) option NI000051. If SOC option NI000051 is IDLE, it is not possible to provision a shared DN.

ISDN Packet Shared DN permits the sharing of a DN with different call types over multiple terminals on the DMS-100 switch. Prior to BCS34, packet mode data (PMD) calls were handled by the Data Packet Network (DPN), a system maintained separately from the DMS-100 switch. Starting in BCS34, a DMS Packet Handler (DMS-PH) was introduced to enable the DMS-100 switch to handle PMD calls. PMD capability was implemented on series 3 peripherals called X25/75 link interface units (XLIU).

ISDN Packet Shared DN (continued)

When using the DPN, it was possible to data ll a single DN with the following three call types:

- voiceband information (VI)
- circuit mode data (CMD)
- packet mode data (PMD)

Prior to this feature, with the DMS-PH, two DNs were necessary to support all call types:

- one for the VI and CMD call types on circuit switched (CS) terminals
- one for the PMD call type on packet switched (PS) terminals

Sharing of all three call types on a single DN was not possible when using the DMS-PH. ISDN Packet Shared DN allows the use of the same DN for both PMD and VI/CMD calls on fully initializing terminals (FIT) or non-initializing terminals (NIT) connected to the DMS-PH. Operating companies can migrate all packet lines from the DPN switch to the DMS-PH. ISDN Packet Shared DN saves DNs since it combines services that were offered on separate DNs.

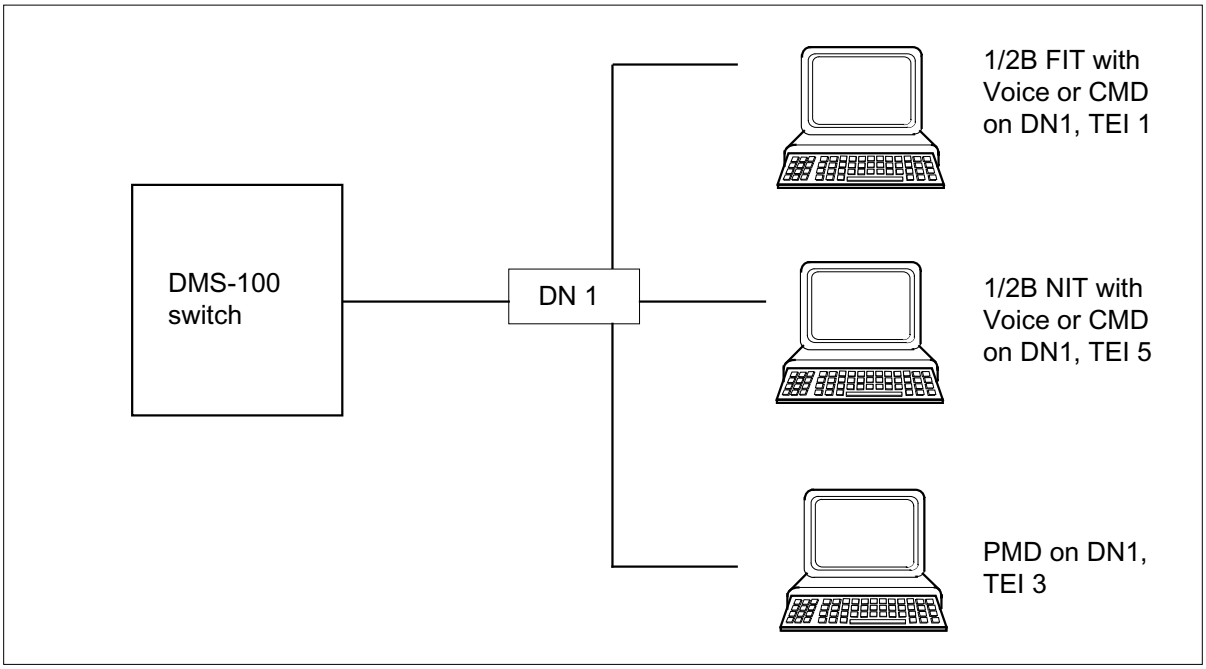
Refer to the NA010 feature DN Sharing with Different Circuit-Mode Call Types, which enhances ISDN Packet Shared DN. This NA010 feature allows DN sharing between different circuit mode call types (VI and CMD). Prior to this feature, only CS (VI or CMD) and PS (PMD) could share a DN.

Prior to the NA008 release, only ISDN basic rate interface (BRI) D-channel access to packet services from terminals provisioned with static terminal endpoint identi ers (STEI) was allowed. Shared DN functionality overcomes this limitation by allowing the provisioning of D-channel packet service to NI-2 compliant FITs that use dynamic TEIs (DTEI). The ability to identify and distinguish NI-1 and NI-2 circuit mode interface con gurations is introduced by the NA008 feature “NI-1/NI-2 Interface Identi cation". All currently supported PS and CS services continue to be supported on the new con guration.

Each FIT, NIT, or D-packet terminal is visible to the DMS-PH as a single device with the terminal endpoint identi er (TEI). The maximum number of terminals for each ISDN interface is eight. Without the support of B-channel contention, associated groups (AG) are used to restrict B-channel access. Each logical terminal identi er (LTID) is restricted to one B-channel access by use of AG provisioning.

ISDN Packet Shared DN (continued)

Example ISDN Packet Shared DN



Operation

Two terminals can be con gured for the same DN, using tw o Service Order System (SERVORD) NEW commands, one terminal with PMD call type and one terminal with VI/CMD call type.

Two distinct hunt groups can be created for the same DN, using two EST commands, one for a PS terminal and the other for a CS terminal. Also, a hunt group member DN can be shared between two terminals, one terminal with PS call type and the other with CS call type. DN sharing can be done using the EST and ADD commands. However, the PS LTIDs and CS LTIDs cannot be assigned to the same hunt group.

To remove a shared DN from service, issue two OUT commands, one to remove the PS call type terminal and the other to remove the CS call type terminal. When the rst OUT command is issued to a shared DN, the DN is detached from the speci ed terminal. However, a shared DN is not put out of service and is not routed for treatment until the OUT command is issued for

ISDN Packet Shared DN (continued)

the second time. Similarly, two DEL commands are required if the DN is shared, one for the CS hunt member and another for the PS hunt member.

Number of terminals allowed on an ISDN BRI interface

Terminal types	FIT	NIT	Provisioned B-packet	D-packet
One B-channel (NI-1) FITs and NITs	0	0	0	8
	0	1	0	7
	1	0	0	7
	1	1	0	6
	0	1	1	6
	1	0	1	6
	0	0	2	6
	2	0	0	6
Two B-channel (2B) FITs and NITs	1	0	0	7
	0	1	0	7
	0	0	1	7
	0	0	2	6
NI-2 FITs and NITs	2 (Note 2)	0	0	6
	1 (Note 2)	1 to 7 (Note 3)	0	6 to 0
	0	1 to 8 (Note 3)	0	0
	1 (Note 2)	0	1	6
	0	7 (Note 2)	1	0
	0	0	2	6

Note 1: Each FIT, NIT, or D-packet terminal is visible to the DMS-100 switch as a single device with a single TEI. The maximum number of terminals on each interface is eight.

Note 2: Without the support of B-channel contention, associated groups (AG) are used to restrict B-channel access. Each LTID is restricted to one B-channel access with AG.

Note 3: All the NITs are associated with the default LTID.

Translations table o w

The ISDN Packet Shared DN translations tables are described in the following list:

- Table KSETFEAT (keyset features) lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE. Table KSETFEAT allows the following additions, modi cations, or deletions of Call Forward/Series Completion (CFX/SCMP) features on a CS ISDN terminal, sharing its DN.
  - — add feature tuples for CS ISDN terminal
  - — change feature tuples for CS ISDN terminal
  - — delete feature tuples for CS ISDN terminal
- Table KSETLINE (keyset lines) contains the DN appearances for business sets and DUs. One entry is required for each DN-related key on a business set or DU. Table KSETLINE allows the following additions, modi cations, and deletions of DNs shared between CS and PS services. Provisioning of Call Forward/Series Completion features in table KSETFEAT is only allowed on CS terminals sharing their DNs.
  - — add tuples for CS and PS ISDN terminals using the same DN
  - — change tuples for CS and PS ISDN terminals, to or from a shared DN
  - — delete tuples for CS and PS ISDN terminals sharing the same DN
- Table HUNTGRP (hunt group) contains the data for each hunt group assigned in the switching unit. Table HUNTGRP is upgraded with new CALLTYPE (CT) options, VI_CMD or PMD. Call type options provide support for separate hunt groups with CS services (VI/CMD) and PS services (PMD), using the same pilot DN.

  Feature ISDN Packet Shared DN allows DLH, DNH, MLH, or PRH hunt groups to be assigned on the VI/CMD appearance of a shared DN. Only DLH and DNH type hunt groups can be assigned to the PMD appearance of a DN. A DN can only be data lled as shared if SOC option NI000051 is ON. The following table control rules for shared ISDN terminals apply to table HUNTGRP:
  - — Members can be added to hunt groups for CS and PS NI-2 ISDN terminals provisioned on the same DN.
  - — Two separate hunt groups for CS and PS ISDN terminals can be added on the same DN.
  - — Attributes of hunt groups with call types PMD and VI_CMD on the same DN can be changed.
  - — Hunt groups provisioned as shared DNs can be deleted.

ISDN Packet Shared DN (continued)

- Table HUNTMEM (hunt member) lists the members assigned to the hunt groups in table HUNTGRP. Table HUNTMEM allows provisioning of members of hunt groups that share their DNs with different call types. The following table control rules for shared ISDN terminals apply to table HUNTMEM:
  - — Members can be added to hunt groups for CS and PS NI2 ISDN terminals provisioned on the same DN.
  - — Attributes of members of hunt groups provisioned for call types PMD and VI/CMD on the same DN can be changed.
  - — Hunt members provisioned as shared DNs can be deleted.
- Table PREFHUNT (preferential hunt) allows assigning preferences on members of hunt groups with CS services when sharing their DNs with terminals with PS services. The Preferential Hunt (PRH) feature is an optional feature that can be assigned to one or more of the DNH groups. The following table control rules for shared ISDN terminals apply to table PREFHUNT:
  - — Preferences can be added on members of hunt groups provisioned for CS and PS call types with shared DNs.
  - — Preferences can be changed on members of hunt groups provisioned for CS and PS call types with shared DNs.
  - — Preferences can be deleted on members of hunt groups provisioned for CS and PS call types with shared DNs.
- MADN (multiple appearance directory number) tables (MDNGRP and MDNMEM) contain information associated with each MADN group and for each member of a MADN group, respectively. Table MDNGRP allows modi cation of MADN group attrib utes of a CS ISDN terminal with DN shared call type.
- Entries in table MDNMEM are added automatically after MADN members are created in table IBNLINES or KSETLINE or using SERVORD. Table MDNMEM allows modi cation of attributes by group members sharing CS services with PS services with DN shared call type.

ISDN Packet Shared DN (continued)

Limitations and restrictions

The following limitations and restrictions apply to ISDN Shared Packet DN:

- The following SERVORD commands are not supported for the packet appearance of the DN:
  - — SUS (suspend service)
  - — RES (restore service)
  - — ADO (add option)
  - — DEO (delete option)
  - — CHF (change feature information for pre-existing feature)
  - — SWLT (swap logical terminals)
- A nailed-up provisioned B-channel (NUPB) packet terminal is blocked from mapping to a line equipment number (LEN) that already has two NI-2 2B FITs.
- A packet terminal cannot share a DN with a MADN group with non-ISDN and ISDN members and a hunt group having a non-ISDN terminal as its pilot.
- All call types associated with a shared DN con guration must be in the same customer group.

Interactions

ISDN Packet Shared DN is capable of coexisting with any existing CS or PS feature. A hunt group can be provisioned separately for voice DNs and Packet DNs. CS and PS call types cannot belong to the same hunt group. Static TEI D-channel and nailed-up B-channel packet terminals are allowed to coexist on the same loop with NI-2 circuit terminals.

Activation/deactivation by the end user

ISDN Packet Shared DN is activated by SOC option NI000051.

Billing

ISDN Packet Shared DN does not affect billing.

Station Message Detail Recording

ISDN Packet Shared DN does not affect Station Message Detail Recording.

Data lling of ce parameter s

ISDN Packet Shared DN does not affect of ce parameters.

ISDN Packet Shared DN (continued)

Data ll sequence

The following table lists the tables that require data ll to implement ISDN Packet Shared DN. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for ISDN Packet Shared DN (Sheet 1 of 2)

Table	Purpose of table
LTGRP	Logical terminal groups. This table associates a logical terminal group name with terminal types that can be datafilled in that group. The key to this table is the name of a group of logical terminals. The options field describes what type of terminals are allowed in a group. The group ISDN is a permanent entry in table LTGRP. It does not need to be manually datafilled and cannot be deleted.
LTDEF (Note)	Logical terminal definition. This table identifies logical terminals and both the associated LEN and the associated TEI. The logical terminal tables consist of tables LTCALLS, LTDATA, LTDEF, LTGRP, and LTMAP. Table LTDEF defines the service profile of an ISDN LTID. The key to this table is an LTID. An LTID consists of a logical terminal group (LTGRP) from table LTGRP and a logical terminal number (LTNUM) in the range of 1 to 1022. This table must be datafilled to provision primary rate interface (PRI) and BRI services. The type of service requested is distinguished by the LTCLASS field, for example BRAFS, PRA, or BRAMFT. Based on the type of service, logical terminal specific options can be datafilled against a particular LTID.
HUNTGRP (Note)	Hunt group. This table contains the data for each hunt group assigned in the switching unit (optional if the DN is part of a hunt group). Feature ISDN Packet Shared DN allows DLH, DNH, MLH, or PRH hunt groups to be assigned on the VI/CMD appearance of a shared DN. Only DLH and DNH type hunt groups can be assigned to the PMD appearance of a DN. A DN can only be datafilled as shared if SOC option NI000051 is ON.
KSETINV	Keyset inventory. This table contains business set and DU inventory data. An entry in this table must be datafilled for each card slot that is assigned to a business set or DU. Each line card slot must be datafilled in table LNINV before being datafilled in table KSETINV. Various formats exist for this table; seven are valid for business sets, two are only for datapaths or DUs, and one (ISDNKSET) is for ISDN terminals.
KSETLINE (Note)	Keyset line. This table contains the DN appearances for business sets and DUs. One entry is required for each DN related key on a business set or DU.

Note: This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

Data ll tab les required for ISDN Packet Shared DN (Sheet 2 of 2)

Table	Purpose of table
KSETFEAT (Note)	Keyset features. This table lists the line features that are assigned to the business sets and DUs listed in table KSETLINE.
HUNTMEM (Note)	Hunt member. This table lists the members assigned to the hunt groups in table HUNTGRP. The numbering of the members of each hunt group must be consecutive commencing at 0 (zero). Feature ISDN Packet Shared DN allows DLH, DNH, MLH, or PRH hunt groups to be assigned on the VI/CMD appearance of a shared DN. Only DLH and DNH type hunt groups can be assigned to the PMD appearance of a DN.
MDNGRP (Note)	Multiple appearance directory number group. This table contains the information on each member associated with each MADN group. Tuples cannot be added to or deleted from tables MDNGRP or MDNMEM. Each call appearance of a Call Appearance Call Handling (CACH) DN appears as a separate tuple in table MDNGRP. For ISDN MADN groups only, the particular logical terminal (as defined in table LTDEF) to which the MADN DN is assigned must have the ISDN electronic key telephone service (EKTS) and DTEI options.
MDNMEM (Note)	Multiple appearance directory number member. Entries in table MDNMEM are added automatically after MADN members are created in table IBNLINES or KSETLINE or using SERVORD.

Note: This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

Translation veri cation tools

ISDN Packet Shared DN adds call type options (VI, CMD, and PMD) to the TRAVER L command. The expanded TRAVER L command is used when specifying the call type of an originating call from a shared DN.

If the user does not provide a call type, and the originating DN is a shared DN, the voice call type is selected and the following warning is displayed.

```
WARNING: Originator is a shared DN, defaulting to VI
call type
```

TRAVER examples for ISDN Packet Shared DN

The following MAP example shows the results of issuing the TRAVER L command with PMD call type. The caller is making an abbreviated PMD call to another PMD terminal on the same switch. The output shows the translation of a PMD line call on the shared DN (7428234) to the packet DN (7428334).

ISDN Packet Shared DN (continued)

Example of result from TRAVER L command with PMD call type

```
>TRAVER L 7428234 PMD 28334 B

Warning: Routing characteristics default to 64Kx25
TABLE KSETLINE
PKT 234 1 DN N 7428234 COMKODAK 0 0 613 $
TABLE NCOS
COMKODAK 0 0 0 KDK0 (OHQ 0 TONE_OHQ) (CBQ 0 3 N 2)$
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA,
VACTRMT, AND DIGCOL
COMKODAK PXDK CXDK CXDK 0 KDKTABLE DIGCOLKDK 2 RPT
TABLE RTECHAR
. PACKET ( BC 64KX25 $)$
TABLE XLAMAP
. Tuple not found. Default is use original XLANAME.
NCOS PRELIM XLA name is NIL. Go to next XLA name.
TABLE XLAMAP
. Tuple not found. Default is use original XLANAME.
TABLE IBNXLA: XLANAME PXDK
TUPLE NOT FOUND
Default is to go to next XLA name.
TABLE XLAMAP
. PACKET CXDK ( XLA PKT64K)$
TABLE IBNXLA: XLANAME PKT64K
PKT64K 28 EXTN N N Y 613 742 5 $
Originator is not an AIN agent, therefore AIN info is not
processed.
TABLE TOFCNAME
613 742 $
TABLE DNINV
613 742 8334 L PKT 334
613 742 $
TABLE DNINV
613 742 8334 L PKT 334l
```

CONTINUED

Example of result from TRAVER L command with PMD call type (continued)

```
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS

TUPLE NOT FOUND
+++ TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES
1 LINE                  6137428334         ST
TREATMENT ROUTES.  TREATMENT IS: GNCT
1 *OFLO
2 LKOUT

 +++ TRAVER: SUCCESSFUL CALL TRACE +++
```

The following MAP example shows the results of issuing the TRAVER L command with VI call type. The caller is making a voice call to another VI terminal on the same switch. The output shows the translation of a VI line call on the shared DN (7428234) to the voice DN (7227154).

Example of result from TRAVER L command with VI call type

```
>TRAVER L 7428234 VI 7227154 B
TABLE KSETLINE
ISDN 1 1 DN Y 7428234 COMKODAK 0 0 613 (SFC) $
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
613 742 8234 8234    (NETK2K ( NAME KODAK7) $)$
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
AIN Orig Attempt TDP: no subscribed trigger.
TABLE NCOS
COMKODAK 0 0 0 KDK0 ( OHQ 0 TONE_OHQ) ( CBQ 0 3 N 2)$
```

CONTINUED

ISDN Packet Shared DN (continued)

Example of result from TRAVER L command with VI call type (continued)

```
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA,
VACTRMT, AND DIGCOL
COMKODAK PXDK CXDK CXDK 0 KDK
TABLE DIGCOL
KDK 7 COL S 1
NCOS PRELIM XLA name is NIL. Go to next XLA name.
TABLE IBNXLA: XLANAME PXDK
TUPLE NOT FOUND
Default is to go to next XLA name.
TABLE IBNXLA: XLANAME CXDK
CXDK 72 STAR
NCOS FEAT XLA name is NIL. Go to next XLA name.
TABLE IBNXLA: XLANAME CXDK
CXDK 27 EXTN N N Y 613 742 5 $
AIN Info Collected TDP: no subscribed trigger.
AIN Info Analyzed TDP: no subscribed trigger.
TABLE TOFCNAME
613 722 $
TABLE DNINV
613 722 7154 L ISDN 2
AIN Term Attempt TDP: no subscribed trigger.
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
613 722 7154 7154
   (NETK2K ( NAME KODAK7) $)$

+++ TRAVER: SUCCESSFUL CALL TRACE +++

  Excess digits were discarded, octothorpe is considered
end of dialling character

DIGIT TRANSLATION ROUTES
1 LINE                  6137227154         ST
TREATMENT ROUTES.  TREATMENT IS: GNCT
1 *OFLO
2 LKOUT

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

SERVORD

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to ISDN Packet Shared DN:

- NEW command
  - — Allows the assignment to an LTID of a DN that was already assigned to another LTID using a previous NEW or EST command. One of the LTIDs must have CS characteristics set to Y, 2B, or NI2 and the other LTID must have PS characteristics set to D or PB. Both LTIDs must have LTCLASS set to BRAFS (basic rate access functional set).
  - — Rejects requests to assign a DN to a second LTID when the switching characteristics do not meet the criteria listed previously.
  - — Rejects requests to assign a DN to a second LTID if the rst L TID belongs in a MADN group with non-ISDN and ISDN members.
  - — Rejects requests to assign a DN to a second LTID if the rst L TID belongs in a DLH or MLH hunt group with a non-ISDN terminal as its pilot.

  Note: Circuit and packet switching characteristics are de ned through the SLT ADD command at the CS and PS prompts.

- OUT command
  - — Allows the removal of a DN from one of two LTIDs on a DN, while leaving the DN in service on the other LTID.
  - — Upon removal from the rst L TID, the intercept argument (BLDN or others) is ignored so that the DN is not routed to treatment until it is removed from the other terminal by issuing another OUT command.
- EST command
  - — Allows the creation of a hunt group and pilot DN for a DN that was already assigned to another LTID using a previous NEW or EST command. The switching characteristics of the LTIDs must meet the criteria described in the NEW command.
  - — Rejects requests to create a hunt group and pilot DN for a DN on a second LTID with switching characteristics that do not meet the criteria described in the NEW command.

  Note: Members are added to the hunt groups with the ADD command as usual when the ADD command does not prompt for DN.

ISDN Packet Shared DN (continued)

- ADD command
  - — Allows adding a DN as a hunt group member when the ADD command prompts for a DN that was already assigned to another LTID using a previous NEW or EST command. The switching characteristics of the LTIDs must meet the criteria described in the NEW command.
  - — Rejects requests to add a DN as a hunt group member, for a DN on a second LTID with switching characteristics that do not meet the criteria described in the NEW command.
- ADO command allows addition of CS features to an LTID of a DN that was already assigned to a PS LTID.
- DEO command allows deletion of CS features from an LTID of a DN that was already assigned to a PS LTID.
- CHF command allows changing of CS features on an LTID of a DN that was already assigned to a PS LTID.
- CHG/CDN command rejects request if the LTID of a DN that was already assigned to a LTID is of another call type.
- SWLT command allows swapping two non-PS LTIDs of the same call type. One or both LTIDs could have their DN shared with another LTID of different call type.
- SUS command allows suspending of service of a CS LTID on a DN that was already assigned to a PS LTID.
- RES command allows restoring of service of a CS LTID on a DN that was already assigned to a PS LTID.

SERVORD prompts

The following table shows the SERVORD prompts used to add ISDN Packet Shared DN to two terminals with different switching capabilities.

SERVORD prompts for adding terminal with the SLT ADD command (Sheet 1 of 2)

Prompt	Valid input	Explanation
FUNCTION	SLT	Set logical terminal command function.
LTID	Terminal ID	Logical terminal identifier.
FUNCTION	ADD	Add terminal command function.
LTCLASS	BRAFS	Logical terminal class. Enter BRAFS for basic rate access functional set.

ISDN Packet Shared DN (continued)

SERVORD prompts for adding terminal with the SLT ADD command (Sheet 2 of 2)

Prompt	Valid input	Explanation
CS	Y	Circuit switched. Enter Y to define circuit switched service.
PS	D	Packet switched. Enter D to define NI2 type one D-channel service.
MAXKEYS	64	Maximum number of keys on terminal.
DEFLTERM	N	Default terminal. Enter N for 2BD service.
TEI_TYPE	DTEI	Terminal endpoint identifier. Enter dynamic TEI (DTEI) for 2BD service.
EKTS	Y	Electronic key type service. Enter Y for 2BD service.
OPTION	PVC	Options vector. Enter PVC (provisional version control) for 2BD service.
VERSION	FUNCTIONAL	Version refinement of PVC. Enter FUNCTIONAL for 2BD service.
ISSUE	2	Issue refinement of PVC. Enter 2 for 2BD service.

SERVORD prompts for (Sheet 1 of 2)

Prompt	Valid input	Explanation
SO	NEW	Service order. Enter NEW to establish service for this DN.
DN	7 digits	Directory number. Enter DN to add call type.
LCC_ACC	ISDNKSET	Line class code access code. Enter ISDNKSET for NI2 terminal.
GROUP	Group name	Customer group. Enter the customer group name that the DN belongs to from table CUSTGRP.
SUBGRP	0 to 7	Customer sub group. Enter sub group number of customer group.
NCOS	0 to 511	Network class of service. NCOS defines a set of capabilities or restrictions in table NCOS that allows or denies service.
SNPA	3 digits	Serving number plan area. Enter area code for this DN.

ISDN Packet Shared DN (continued)

SERVORD prompts for (Sheet 2 of 2)

KEY	1 to 69	Enter number the DN appears on.
RINGING	Y or N	Ringing applied to this DN. Enter N for the PMD service. Only voice circuits have ringing applied.
LATANAME	NILLATA	Local access and transport name of DN. Enter LATA if applicable or NILLATA.
LTG	0 to 9998	Line treatment group of DN. Enter LTG number of DN.
LEN_OR_LTID	Alphanumeric	Logical terminal identifier Consists of a logical terminal group name, one space, and the terminal number. Enter LTID of the terminal that this DN is on from table LTDEF.
VI_LPIC_CHOICE	Y or N	Voice interface primary intra LATA carrier choice. Enter Y to allow datafilling 10XXX or 101XXXX intra LATA calls independent of the PIC.
	CMD	Enter CMD for circuit mode data CS service and datafill refinements CMD_RATE, CMD_PIC, CMD_LPIC, and CMD_LPIC_CHOICE.
CMD_RATE	BOTH	Circuit mode data rate. Enter a rate type of 56, 64, or BOTH.
CMD_PIC	Alphanumeric	Circuit mode data primary inter LATA carrier. Enter PIC of DN.
VI_LPIC	Alphanumeric	Circuit mode data primary intra LATA carrier. Enter LPIC of DN.
VI_LPIC_CHOICE	Y or N	Circuit mode data primary intra LATA carrier choice. Enter Y to allow datafilling 10XXX or 101XXXX intra LATA calls independent of the PIC.

SERVORD examples for adding ISDN Packet Shared DN

The following SERVORD example shows how a terminal with CS capabilities is added to an LTID.

Example of the SLT ADD command in prompt mode adding r st terminal with CS capabilities

```
> SLT
SONUMBER:  JUL 97 07 08 AM
> (CR)
LTID:
> ISDN 20
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> Y
PS:
> N
MAXKEYS:
> 64
DEFLTERM:
> N
TEI_TYPE:
> DTEI
EKTS:
> N
OPTION:
> PVC
VERSION:
> FUNCTIONAL
ISSUE:
> 2
OPTION:
> $
```

Example of the SLT ADD command in no-prompt mode adding r st terminal with CS capabilities

```
> SLT $  ISDN 20 ADD BRAFS Y N 64 N DTEI N PVC FUNCTIONAL 2
```

The following SERVORD example shows how a terminal with PS capabilities is added to an LTID.

ISDN Packet Shared DN (continued)

Example of the SLT ADD command in prompt mode adding second terminal with PS capabilities

```
> SLT
SONUMBER:  JUL 97 07 08 AM
> (CR)
LTID:
> ISDN 30
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> N
PS:
> D
OPTION:
> $
```

Example of the SLT ADD command in no-prompt mode adding second terminal with PS capabilities

```
> SLT $ ISDN 30 ADD BRAFS N D $
```

The following SERVORD example shows how a new DN is assigned to an existing LTID with CS service.

ISDN Packet Shared DN (continued)

Example of the NEW command in prompt mode associating DN and key on r st ISDN terminal

```
> NEW
SONUMBER:  JUL 97 07 08 AM
> (CR)
DN:
> 7235116
LCC_ACC:
> ISDNKSET
GROUP:
> CUSTB
SUBGRP:
> 1
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
> Y
LTANAME:
> NILLATA
LTG:
> ISDN 20
OPTKEY:
> $
```

Example of the NEW command in no-prompt mode associating DN and key on r st ISDN terminal

```
> NEW $ 7235116 ISDNKSET CUSTB 1 0 613 1 Y NILLATA ISDN 20 $
```

The following SERVORD example shows how a new DN is assigned to an existing LTID with PS service.

ISDN Packet Shared DN (continued)

Example of the NEW command in prompt mode associating DN and key on second ISDN terminal

```
> NEW
SONUMBER:  JUL 97 07 08 AM
> (CR)
DN:
> 7235116
LCC_ACC:
> ISDNKSET
GROUP:
> CUSTB
SUBGRP:
> 1
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
> N
LTANAME:
> NILLATA
LTG:
> ISDN 30
OPTKEY:
>$
```

Example of the NEW command in no-prompt mode associating DN and key on second ISDN terminal

```
> NEW $ 7235116 ISDNKSET CUSTB 1 0 613 1 N NILLATA ISDN 30 $
```

SERVORD examples for SLT ATT command

The following two examples show the SERVORD SLT ATT command attaching an existing LTID to a LEN assigned to the same DN on separate terminals.

Example of the SLT ATT command in prompt mode attaching LEN to r st terminal with CS capabilities

```
> SLT
SONUMBER:  JUL 97 07 08 AM
> (CR)
LTID:
> ISDN 20
FUNCTION:
> ATT
LEN:
> HOST 12 0 0 12
OPTION:
> $
```

Example of the SLT ATT command in no-prompt mode attaching LEN to r st terminal with CS capabilities

```
> SLT $ ISDN 20 ATT HOST 12 0 0 12 $
```

Example of the SLT ATT command in prompt mode attaching LEN to second terminal with PS capabilities

```
> SLT
SONUMBER:  JUL 97 07 08 AM
> (CR)
LTID:
> ISDN 30
FUNCTION:
> ATT
LEN:
> HOST 12 0 0 12
OPTION:
> TEI
TEI:
> 1
OPTION:
> $
```

Example of the SLT ATT command in no-prompt mode attaching LEN to second terminal with PS capabilities

```
> SLT $ ISDN 20 ATT HOST 12 0 0 12 TEI 1 $
```

ISDN Packet Shared DN (continued)

Scenarios

The following SERVORD commands share a DN between a CS LTID and a PS LTID.

```
> SLT $ ISDN 101 ADD BRAFS Y N 64 N DTEI $ N PVC FUNCTIONAL 2 $
```

```
> SLT $ ISDN 102 ADD BRAFS N D
```

```
> NEW $ 723500 ISDNKSET IBNTST 0 0 613 1 Y NILLATA 0 ISDN 101 $
```

```
> NEW $ 723500 ISDNKSET IBNTST 0 0 613 1 N NILLATA 0 ISDN 102 $
```

```
> SLT $ ISDN 101 ATT HOST 12 0 0 12 $
```

```
> SLT $ ISDN 102 ATT HOST 12 0 0 12 TEI 1 $
```

The following SERVORD commands share a DN between a CS LTID and a hunt group pilot LTID with PS service.

ISDN Packet Shared DN (continued)

```
> SLT $ ISDN 101 ADD BRAFS Y N 64 N DTEI $ N PVC FUNCTIONAL 2 $
```

```
> SLT $ ISDN 102 ADD BRAFS N D
```

```
> NEW $ 7235000 ISDNKSET IBNTST 0 0 613 1 Y NILLATA 0 ISDN 101 $
```

```
> EST $ MLH 100 7235000 ISDNKSET IBNTST 0 0 613 1 N NILLATA 0
ISDN 102 $ $ 5
```

```
> SLT $ ISDN 101 ATT HOST 12 0 0 12 $
```

```
> SLT $ ISDN 102 ATT HOST 12 0 0 12 TEI 1 $
```

```
> ADD $ MLH ISDN 102 1 $ $ $
```

The reverse order of adding a DN as pilot DN to the hunt group PS LTID rst and then to the CS LTID is also supported. Use these steps for sharing a DN among pilot DN of hunt group CS LTID and a PS LTID. The applicable hunt groups for CS terminals are DNH, DLH, PRH, and MLH. The applicable hunt groups for PS terminals are DLH and MLH.

The following SERVORD commands provide sharing of a DN between a PS LTID and a hunt group CS LTID (as DNH hunt group member DN).

ISDN Packet Shared DN (continued)

```
> SLT $ ISDN 102 ADD BRAFS Y N 64 N DTEI $ N PVC FUNCTIONAL 2 $
```

```
> SLT $ ISDN 101 ADD BRAFS N D
```

```
> EST $ DNH 100 7235000 ISDNKSET IBNTST 0 0 613 1 Y NILLATA 0
ISDN 102 $  $ 5
```

```
> NEW $ 7235005 ISDNKSET IBNTST 0 0 613 1 N NILLATA 0 ISDN 101 $
```

```
> SLT $ ISDN 102 ATT HOST 12 0 0 12 $
```

```
> SLT $ ISDN 101 ATT HOST 12 0 0 12 TEI 1 $
```

The reverse order of adding a DN to the packet LTID rst and then as member of the Hunt Circuit LTID is also supported.

In the existing SERVORD system, it is possible to add 20 hunt group members with one ADD command. The same is supported in this feature.

The following SERVORD commands remove service for a shared DN.

ISDN Packet Shared DN (end)

> SLT $ ISDN 100 DET

> SLT $ ISDN 101 DET

> OUT $ 7235000 ISDN 100 BLDN

> OUT $ 7235000 ISDN 101 BLDN

> SLT $ ISDN 101 REM

> SLT $ ISDN 100 REM

ISDN Packet Single DN

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

To operate, ISDN Packet Single DN has the following prerequisites:

- ISDN Packet Shared DN permits the sharing of a directory number (DN) with different call types over multiple terminals on the DMS-100 switch. ISDN Packet Shared DN includes the functionality of the following features:
  - — ISDN Packet SERVORD Commands for Shared DN
  - — ISDN Packet Query Commands for Shared DN
  - — ISDN Packet Table Control for Shared DN
  - — ISDN Packet DNCT CPID Base
- NI-1/NI-2 Interface Identi cation provides the DMS-100 switch capability to identify and restrict National ISDN 1 (NI-1) and National ISDN 2 (NI-2) terminal interfaces.

Description

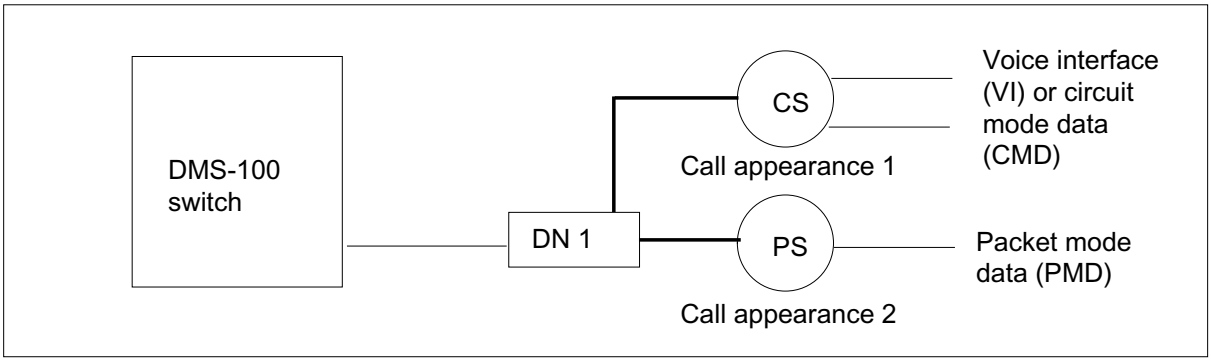
ISDN Packet Single DN allows the use of the same directory number (DN) for packet mode (PMD) or voice interface (VI) and circuit mode data (CMD) call appearances on Fully Initializing Terminals (FIT) called integrated terminals (IT). ITs use only one terminal endpoint identi er (TEI) for all call types. With ISDN Packet Single DN, end users can establish packet mode data (PMD) and voice interface (VI) or circuit mode data (CMD) calls independently and simultaneously from or to the same DN on an IT. This capability is data lled as tw o B-channel and one D-channel (2BD) provisioning. On an IT, the call types would be represented as different appearances of the DN on separate keys.

Presently, the DMS-100 switch supports ISDN basic rate interface (BRI) D-channel access to packet services only from terminals with provisioned static TEIs. Single DN functionality overcomes this limitation by allowing the provisioning of D-channel packet service to National ISDN (NI-2) compliant FIT dynamic TEIs (DTEI). All currently supported packet switched (PS) and

circuit switched (CS) services will continue to be supported on the new con guration.

Provisioning of ISDN Packet Single DN functionality is incremental to NI-1 SERVORD provisioning. NI-1 provisioning remains unchanged. Feature ISDN Packet Single DN does not implement packet services for non-initializing terminals (NIT) with dynamic terminal assignment.

Example ISDN Packet Single DN



Operation

In table LTDEF, support for access privilege (2BD) has been added when provisioning an ISDN fully initialized (FIT) integrated terminal. To enable a 2BD terminal, the LTID must be data lled with the BRAFS option, the NITYPE option must be speci ed with a v alue of NI2, and a dynamic TEI (DTEI) must be speci ed. If the protocol variant control (PVC) option is not speci ed, it is added by def ault as PVC Functional 2. Attempts to change an existing access privilege to 2BD are blocked.

In table KSETLINE, packet mode data (PMD) option designates a key on an IT for packet service (PS). A key that is not de ned as PMD def aults to VI circuit service (CS).

Translations table o w

The ISDN Packet Single DN translations tables are described in the following list:

- Table LTDEF supports the new access privilege, 2BD, to provision the ISDN FIT integrated terminal. To provision an IT the tuple must have the BRAFS option, NITYPE = NI2, and one of the DTEI options. If the PVC option is not speci ed it is added by def ault. Attempts to change an existing access privilege to 2BD are blocked.
- Table KSETLINE adds packet mode data (PMD) and default directory number (DFDN) as valid line options for ITs. Option PMD designates a

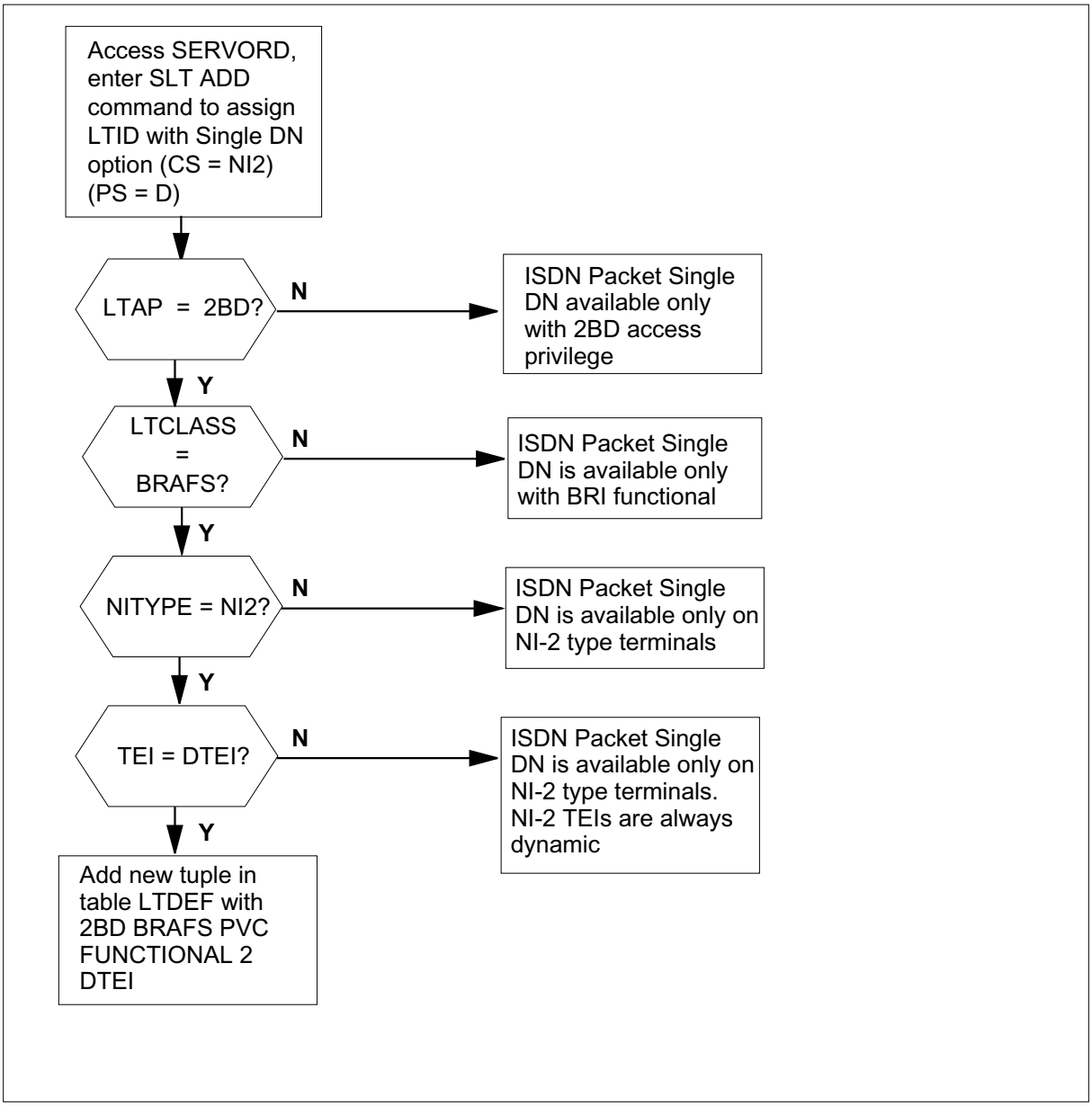
ISDN Packet Single DN (continued)

speci c key on a IT to support packet service (PS). De ning a DN to a key without the call type option speci ed defaults to voice interface (VI). The primary directory number of PMD service is de ned with the DFDN option.

- Table KSETFEAT lters out an y DNs de ned with PMD call type when assigning features Call Forward (CFX) or Key Short Hunt (KSH) to a line on an IT. Only VI call types are forwarded.
- Table LTMAP allows only the dynamic terminal endpoint identi er (DTEI) for ITs when data lling MAP_OPTION_LIST . To allow provisioning of an IT in table LTMAP, sub eld OPTION must be data lled with DCHCHNL.

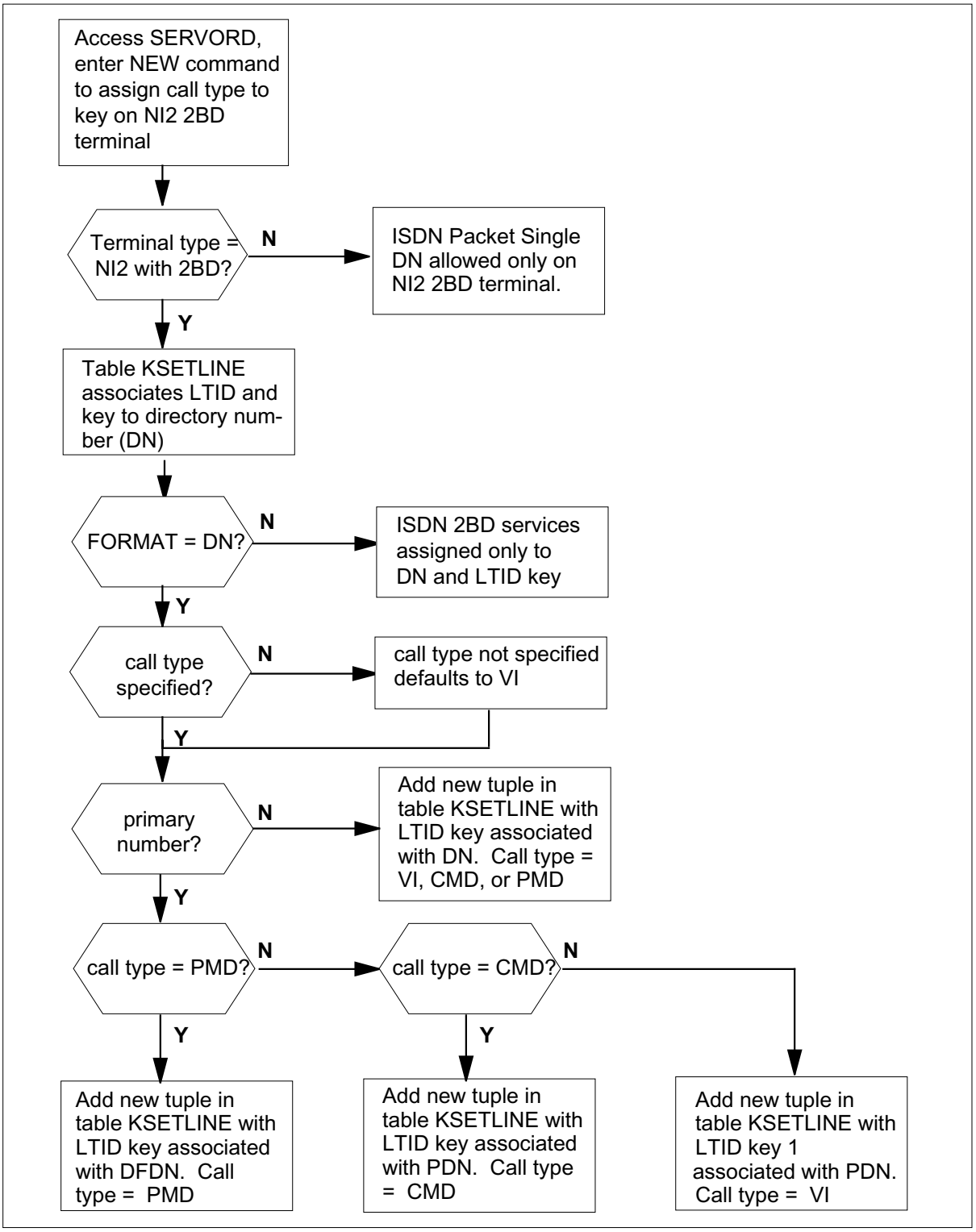
ISDN Packet Single DN (continued)

Table o w for ISDN Packet Single DN to add a new terminal with 2BD access



ISDN Packet Single DN (continued)

Table o w for ISDN Packet Single DN to associate the IT key with call type and DN



Limitations and restrictions

The following limitations and restrictions apply to ISDN Single Packet DN:

- If call type is not speci ed when de ning ne w ISDN DN key, voice interface (VI) is applied as default.
- When data lling ISDN P acket Single DN both VI/CMD and PMD call type key appearances must be de ned.
- Packet mode data (PMD) call type cannot be assigned to rst k ey on terminal provisioned as 2BD. By default the primary directory number (PDN) assigned to key one is VI type.
- Primary number for PMD must be assigned as OPTION default directory number (DFDN).
- Only the DN format in table KSETLINE is supported.
- DN cannot be shared between two keys with same call types (VI, CMD, or PMD).
- The ringing option is not supported on PMD keys.
- Features Key Short Hunt (KSH) and Call Forward (CFX), assigned in table KSETFEAT, are modi ed to bypass DNs assigned to PMD type.
- In table LTMAP the following controls will be implemented:
  - — Static terminal endpoint identi er (STEI) option will not be allo wed when data lling a terminal that supports ISDN P acket Single DN service.
  - — PHI option is not allowed for 2BD type terminals.
  - — BCH option is not allowed for 2BD type terminals.
  - — The DCHNL option must be speci ed for 2BD type terminals.
  - — A 2BD terminal cannot be attached to an ILD LEN.
- The following terminal access privilege types can coexist on a single ISDN loop.
  - — Single DN, single dynamic TEI, with different CTs on an integrated FIT (2BD access privilege).
  - — NI-2 FIT (2B access privilege with NITYPE option set to NI-2).

Interactions

ISDN Packet Single DN has the following functionality interactions.

ISDN Packet Single DN (continued)

The applicable hunt groups for circuit switched (CS) terminal access (VI CMD) are DNH, DLH, PRH, and MLH. The applicable hunt groups for packet switched (PS) terminal access (PMD) are DLH and MLH.

When establishing members of hunt group types DLH and MLH for ISDN Packet Single DN the PMD option must specify key number of PMD appearance. Primary PMD numbers must have default directory number (DFDN) assigned.

The SERVORD OUT command when applied to shared DNs must specify key of PMD or VI CMD service to be removed. Two OUT commands are necessary to remove a shared DN from service.

Provisioning of the ISDN Packet Single DN functionality is incremental to NI-1 SERVORD provisioning.

Activation/deactivation by the end user

ISDN Packet Single DN is activated by SOC NI000051.

Billing

ISDN Packet Single DN does not affect billing.

Station Message Detail Recording

ISDN Packet Single DN does not affect Station Message Detail Recording.

Data lling of ce parameter s

ISDN Packet Single DN does not affect of ce parameters.

Data ll sequence

The following table lists the tables that require data ll to implement ISDN Packet Single DN. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for ISDN Packet Single DN (Sheet 1 of 2)

Table	Purpose of table
LTGRP	Logical terminal groups. Associates a logical terminal group name with terminal types that can be datafilled in that group. The key to this table is the name of a group of logical terminals. The options field describes what type of terminals are allowed in a group. The group ISDN is a permanent entry in table LTGRP. It does not need to be manually datafilled and cannot be deleted.
LTDEF (Note)	Logical terminal definition. Identifies logical terminals and both the associated line equipment number (LEN) and the associated terminal equipment interface (TEI). The logical terminal tables consist of tables LTCALLS, LTDATA, LTDEF, LTGRP, and LTMAP. Table LTDEF defines the service profile of an ISDN logical terminal (LTID). The key to this table is an LTID. An LTID consists of a logical terminal group (LTGRP) from table LTGRP and a logical terminal number (LTNUM) in a range of 1 to 1022. This table must be datafilled to provision primary rate interface (PRI) and basic rate interface (BRI) services. The type of service requested is distinguished by the LTCLASS field, for example BRAFS, PRA, or BRAMFT. Based on the type of service, logical terminal specific options can be datafilled against a particular LTID.
HUNTGRP (Note)	Hunt group. Contains the data for each hunt group assigned in the switching unit. (Optional if DN is part of hunt group). Feature ISDN Packet Single DN allows DLH, DNH, MLH, or PRH hunt groups to be assigned on the voice interface (VI) circuit mode data (CMD) appearance of a shared DN. Only DLH and DNH type hunt groups can be assigned to the packet data mode (PMD) appearance of a DN. A DN can only be datafilled as shared if SOC option NI000051 is ON.
KSETINV	Key set inventory. Contains business set and data unit inventory data. An entry in this table must be datafilled for each card slot that is assigned to a business set or data unit (DU). Each line card slot must be datafilled in table LNINV before being datafilled in table KSETINV. Various formats exist for this table; seven are valid for business sets, two are only for datapaths or data units and one (ISDNKSET) is for ISDN terminals.
KSETLINE (Note)	Key set line. Contains the directory number (DN) appearances for business sets and data units. One entry is required for each DN related key on a business set and data unit.

Note: These tables are datafilled through SERVORD; therefore, no datafill procedure is provided.

ISDN Packet Single DN (continued)

Data ll tab les required for ISDN Packet Single DN (Sheet 2 of 2)

Table	Purpose of table
KSETFEAT (Note)	Key set features. Lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE.
HUNTMEM (Note)	Hunt member. Lists the members assigned to the hunt groups in table HUNTGRP. The numbering of the members of each hunt group must be consecutive commencing at 0 (zero). Feature ISDN Packet single DN (AF6872) allows DLH, DNH, MLH, or PRH hunt groups to be assigned on the voice interface (VI) circuit mode data (CMD) appearance of a shared DN. Only DLH and DNH type hunt groups can be assigned to the packet data mode (PMD) appearance of a DN.
MDNGRP (Note)	Multiple appearance directory number group. Contains the information on each member associated with each MADN group. Tuples cannot be added to or deleted from tables MDNGRP or MDNMEM. Each call appearance (CA) of a Call Appearance Call Handling (CACH) directory number (DN) appears as a separate tuple in table MDNGRP. For ISDN MADN groups only, the particular logical terminal (as defined in table LTDEF) to which the MADN directory number is assigned, must have the ISDN electronic key telephone service (EKTS) and dynamic terminal end-point identifier (DTEI) option.
MDNMEM (Note)	Multiple appearance directory number member. Entries in table MDNMEM are added automatically after multiple appearance directory number (MADN) members are created in table IBNLINES or KSETLINE or using the Service Order System (SERVORD).
DNCHNL	DN channel type. Stores the ISDN basic and supplementary service parameters for data on a directory number (DN) and channel type basis. The X.25 basic and supplementary service parameters in this table are a refinement of the packet mode data (PMD) call type in table DNCTINFO.
DNCTINFO	DN call type information. Stores the ISDN voice and data parameters on a directory (DN) number and call type basis. The X.25 basic and supplementary service parameters apply only to the packet mode data (PMD) call type.
LTMAP	Logical terminal mapping. Maps the logical terminals to a line equipment number (LEN) and the terminal equipment interface depending, on the logical terminal access privilege (LTAP).
Note: These tables are datafilled through SERVORD; therefore, no datafill procedure is provided.	

Data ll e xample for table LTDEF

The following example shows sample data ll for table L TDEF.

```
 LTKEY LTAP
                              CLASSREF
----------------------------------------------------------

 NI2   15   2B
 BRAFS (NITYPE NI2) (PVC FUNCTIONAL 2) (DTEI ) $
 NI2   16  2BD
 BRAFS (NITYPE NI2) (PVC FUNCTIONAL 2) (DTEI ) $
 NI2   17  2BD
 BRAFS (NITYPE NI2) (PVC FUNCTIONAL 2) (DTEI ) $
```

Data ll e xample for table KSETLINE

The following example shows sample data ll for table KSETLINE.

```
  KSETKEY
     FORMAT
                           DNRESULT
-------------------------------------------------------
NI2        17     1
                       DN     Y          7235117
                       BNR     0         0  613
                                    (      SFC)$
NI2        17     7
                       DN     N          7235117
                       BNR     0         0  613
                        (       PMD)  (      DFDN)$
```

Data ll e xample for table KSETFEAT

The following example shows sample data ll for table KSETFEA T.

ISDN Packet Single DN (continued)

```
  FEATKEY      FEATURE
                                                 KVAR
--------------------------------------------------------
NI2         15    24       RLS          RLS
NI2         16     1      ACOU         ACOU  2  2
NI2         16     1      CRBL         CRBL  3  3
NI2         16     1       DBC          DBC   DBC_SP
NI2         16     2       AFC          AFC  1    DBC_SP
NI2         16     3       AFC          AFC  1    DBC_SP
NI2         16     4       AFC          AFC  1    DBC_SP
NI2         16     5       AFC          AFC  1    DBC_SP
NI2         16     6       AFC          AFC  1    DBC_SP
NI2         16     9        FC           FC  3
NI2         16    10      DROP         DROP
```

Data ll e xample for table LTMAP

The following example shows sample data ll for table L TMAP.

```
 LTKEY              MAPPING         OPTION
---------------------------------------------------------

NI2     1  LEN HOST  02 0 07 03
           DCHCHNL  $
NI2     2  LEN HOST  02 0 08 04
          DCHCHNL  $
```

Translation veri cation tools

ISDN Packet Single DN does not use translation veri cation tools.

SERVORD

SERVORD limitations and restrictions

ISDN Packet Single DN has no SERVORD limitations and restrictions.

SERVORD prompts

The following table shows the SERVORD prompts used to add a NI2 terminal capable of supporting ISDN Packet Single DN on a line.

SERVORD prompts for ISDN Packet Single DN SLT ADD terminal

Prompt	Valid input	Explanation
FUNCTION	SLT	Set logical terminal command function
LTID	Terminal ID	Logical terminal identifier.
FUNCTION	ADD	Add terminal command function
LTCLASS	BRAFS	Logical terminal class. Enter BRAFS for basic rate access functional set.
CS	NI2	Circuit switched. Enter NI2 to define NI-2 type 2B-channel service.
PS	D	Packet switched. Enter D to define NI2 type one D-channel service.
MAXKEYS	64	Maximum number of keys on terminal.
DEFLTERM	N	Default terminal. Enter N for 2BD service.
TEI_TYPE	DTEI	Terminal endpoint identifier. Enter dynamic TEI (DTEI) for 2BD service.
EKTS	Y	Electronic key type service. Enter Y for 2BD service.
OPTION	PVC	Options vector. Enter PVC (provisional version control) for 2BD service.
VERSION	FUNCTIONAL	Version refinement of PVC. Enter FUNCTIONAL for 2BD service.
ISSUE	2	Issue refinement of PVC. Enter 2 for 2BD service.

SERVORD example for adding ISDN Packet Single DN SLT ADD terminal

The following SERVORD example shows how a NI2 terminal with 2BD capabilities is added.

ISDN Packet Single DN (continued)

Example of the SLT ADD command in prompt mode—adding NI2 terminal with the capability to handle 2BD call type

```
>SLT
SONUMBER:  JUL 97 07 08 AM
LTID:
>ISDN 20
FUNCTION:
>ADD
LTCLASS:
>BRAFS
CS:
>NI2
PS:
>D
MAXKEYS:
64:
DEFLTERM:
>N
TEI_TYPE:
>DTEI
EKTS:
>Y
OPTION:
>PVC
VERSION:
>FUNCTIONAL
ISSUE:
>2
OPTION:
>$
```

Example of the SLT ADD command in non-prompt mode adding NI2 terminal

```
>SLT ISDN 20 ADD BRAFS NI2 D 64 N DTEI Y PVC FUNCTIONAL 2
```

ISDN Packet Single DN (continued)

Note: The PVC option is the default on NI2 terminals if no PVC option is entered.

SERVORD prompts for ISDN Packet Single DN NEW service for CMD, VI, or PMD call type (Sheet 1 of 2)

Prompt	Valid input	Explanation
SO	NEW	Enter NEW to establish service for this DN.
DN	7 digits	Enter DN to add call type
LCC_ACC	ISDNKSET	Line class code access code. Enter ISDNKSET for NI2 terminal.
GROUP	Group name	Customer group. Enter the customer group name DN belongs to. From table CUSTGRP.
SUBGRP	0 to 7	Customer sub group. Enter sub group number of customer group.
NCOS	0 to 511	Network class of service. NCOS defines a set of capabilities or restrictions in table NCOS that allows or denies service.
SNPA	3 digits	Serving number plan area. Enter area code for this DN.
KEY	1 to 69	Enter number the DN will appear on.
RINGING	N	Ringing applied to this DN. Enter N for the PMD service. Only voice circuits have ringing applied.
LATANAME	NILLATA	Local access and transport name of DN. Enter LATA if applicable or NILLATA.
LTG	o to 9998	Line treatment group of DN. Enter LTG number of DN.
LEN_OR_LTID	Alphanumeric	Logical terminal identifier Consists of a Logical terminal group name, one space, and the terminal number. Enter LTID of the terminal this DN is on. From table LTDEF.
OPTKEY	1 to 69	Option Key. Enter key number to assign next option to.
OPTION	PMD	Terminal set options. Enter PMD packet mode data PS service.
OPTION	VI	Enter VI for voice interface CS service and datafill refinements VI_PIC, VI_LPIC, and VI_LPIC_CHOICE.
VI_PIC	Alphanumeric	Voice interface primary inter LATA carrier. Enter PIC of DN.

ISDN Packet Single DN (continued)

SERVORD prompts for ISDN Packet Single DN NEW service for CMD, VI, or PMD call type (Sheet 2 of 2)

Prompt	Valid input	Explanation
VI_LPIC	Alphanumeric	Voice interface primary intra LATA carrier. Enter LPIC of DN.
VI_LPIC_CHOICE	Y or N	Voice interface primary intra LATA carrier choice. Enter Y to allow datafilling 10XXX or 101XXXX intra LATA calls independent of the PIC.
	CMD	Enter CMD for circuit mode data CS service and datafill refinements CMD_RATE, CMD_PIC, CMD_LPIC, and CMD_LPIC_CHOICE.
CMD_RATE	BOTH	Circuit mode data rate. Enter a rate type of 56, 64, or BOTH.
CMD_PIC	Alphanumeric	Circuit mode data primary inter LATA carrier. Enter PIC of DN.
VI_LPIC	Alphanumeric	Circuit mode data primary intra LATA carrier. Enter LPIC of DN.
VI_LPIC_CHOICE	Y or N	Circuit mode data primary intra LATA carrier choice. Enter Y to allow datafilling 10XXX or 101XXXX intra LATA calls independent of the PIC.

SERVORD examples for adding ISDN Packet Single DN and associating different call types to keys on an NI2 terminal

Both PMD and (VI or CMD) service are assigned to the same DN and different keys on a terminal. Assigning a DN and key on the terminal without PMD call type de ned will def ault to VI service.

ISDN Packet Single DN (continued)

Example of the NEW command in prompt mode associating DN and key on NI2 terminal no call type option identi ed. SER VORD assigns voice interface (VI) as default

```
>NEW
SONUMBER:  JUL 97 07 08 AM
DN:
>7235116
LCC_ACC:
>ISDNKSET
GROUP:
>CUSTB
SUBGRP:
>1
NCOS:
> 0
SNPA:
> 613
KEY:
> 7
RINGING:
>Y
LTANAME:
>NILLATA
LTG:
>ISDN 20
OPTKEY:
> $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y
***  WARNING  ***
call type NOT ENTERED FOR DN, DEFAULT VOICE WILL BE
USED.
```

Example of the NEW command in non-prompt mode associating DN and key on NI2 terminal with no call type

```
>NEW 7235116 ISDNKSET CUSTB 1 0 613 7 N NILLATA ISDN 20 $
```

Note: Because no call type option was entered the following default tuple will be created in table KSETLINE.

(ISDN 20 7 DN Y 7235116 CUSTB 1 0 613 VI)

ISDN Packet Single DN (continued)

Example of the NEW command in prompt mode associating DN and key on NI2 terminal with call type PMD

```
>NEW
SONUMBER:  JUL 97 07 08 AM
DN:
>7235116
LCC_ACC:
>ISDNKSET
GROUP:
>CUSTB
SUBGRP:
>1
NCOS:
> 0
SNPA:
> 613
KEY:
> 7
RINGING:
>N
LTANAME:
>NILLATA
LTG:
>ISDN 20
OPTKEY:
> 7
OPTION:
> PMD
OPTKEY:
>$
```

Example of the NEW command in non prompt mode-associating DN and key on NI2 terminal with call type PMD

```
>NEW 7235116 ISDNKSET CUSTB 1 0 613 7 N NILLATA ISDN 20 7 PMD $
```

Note: If call type PMD option is assigned to another key on the terminal, the following error message will be issued.

```
***  ERROR - INCONSISTENT DATA  ***
DN CANNOT BE SHARED AMONG TWO KEYS OF THE SAME CALL TYPE
```

ISDN Packet Single DN (continued)

Example of the NEW command in prompt mode-associating DN and key on NI2 terminal with call type VI

```
>NEW
SONUMBER:  JUL 97 07 08 AM
DN:
>7235116
LCC_ACC:
>ISDNKSET
GROUP:
>CUSTB
SUBGRP:
>1
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
>N
LTANAME:
>NILLATA
LTG:
>ISDN 20
OPTKEY:
> 1
OPTION:
> VI
VI_PIC:
>C521
VI_LPIC:
>C522
VI_LPIC_CHOICE:
>Y
OPTKEY:
>$
```

Example of the NEW command in non-prompt mode-associating DN and key on NI2 terminal with call type VI

```
>NEW NOW 97 7 08 08 AM 7235116 ISDNKSET CUSTB 1 0 613 1 N
NILLATA ISDN 20 1 VI C521 C522 Y$
```

ISDN Packet Single DN (continued)

Example of the NEW command in prompt mode-associating DN and key on NI2 terminal with call type CMD

```
>7235116
LCC_ACC:
>ISDNKSET
GROUP:
>CUSTB
SUBGRP:
>1
NCOS:
> 0
SNPA:
> 613
KEY:
> 7
RINGING:
>N
LTANAME:
>NILLATA
LTG:
>ISDN 20
OPTKEY:
> 7
OPTION:
> CMD
CMD_RATE:
>64
CMD_PIC:
>C521
CMD_LPIC:
>C522
CMD_LPIC_CHOICE:
>Y
```

Example of the NEW command in non-prompt mode-associating DN and key on 2BD terminal with call type CMD

```
>NEW 7235116 ISDNKSET CUSTB 1 0 613 7 N NILLATA ISDN 20 7 CMD
64 C521 6522 Y $
```

ISDN Packet Single DN (continued)

Example of the NEW command in prompt mode associating DN and key 1 on NI2 terminal with call type PMD

```
>NEW
SONUMBER:  JUL 97 07 08 AM
DN:
>7235116
LCC_ACC:
>ISDNKSET
GROUP:
>CUSTB
SUBGRP:
>1
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
>N
LTANAME:
>NILLATA
LTG:
>ISDN 20
OPTKEY:
> 1
OPTION:
> PMD
OPTKEY:
>$
```

Example of the NEW command in non-prompt mode-associating DN and key 1 on 2BD terminal with call type PMD

```
>NEW NOW 97 7 08 08 AM 7235116 ISDNKSET CUSTB 1 0 613 1 N
NILLATA ISDN 20 1 PMD $
```

Note: If call type PMD option is assigned to key one on the terminal the following error message will be issued.

```
***  ERROR - INCONSISTENT DATA  ***
LINE OPTION PMD CANNOT BE ON KEY 1.
```

ISDN Packet Single DN (continued)

Example of the EST command in prompt mode establishing DN 7235116 as DLH hunt group pilot on LTID ISDN 20, key 18 for PMD call type.

```
>EST
SONUMBER:  JUL 97 07 08 AM
GROUPTYPE:
>DLH
PILOT_DN:
>7235116
LCC_ACC:
>ISDNKSET
GROUP:
>CUSTB
SUBGRP:
>1
NCOS:
> 0
SNPA:
> 613
KEY:
> 18
RINGING:
>N
LATANAME:
>NILLATA
LTG:
>ISDN 20
PILOT_LEN:
>$
OPTION:
> PMD
GROUPSIZE:
> 2
```

ISDN Packet Single DN (continued)

Example of the EST command in non prompt mode-establishing DN 7235116 as DLH hunt group pilot on LTID ISDN 20, key 18 for PMD call type.

```
>EST NOW 97 7 08 08 AM 7235116 ISDNKSET CUSTB 1 0 613 1 N
NILLATA ISDN 20 $ PMD 2$
```

SERVORD prompts for ISDN Packet Single DN EST for establishing DLH or DNH hunt group with PMD call type pilot (Sheet 1 of 2)

Prompt	Valid input	Explanation
SO	EST	Enter EST to establish this DN as pilot member of a hunt group..
GROUPTYPE	DLH or MLH	Hunt group type. Enter DLH for distributed line hunting or DNH for directory number hunting.
PILOT_DN	7 digits	Pilot member of hunt group. Enter DN to add call type
LCC_ACC	ISDNKSET	Line class code access code. Enter ISDNKSET for NI2 terminal.
GROUP	Group name	Customer group. Enter the customer group name DN belongs to. From table CUSTGRP.
SUBGRP	0 to 7	Customer sub group. Enter sub group number of customer group.
NCOS	0 to 511	Network class of service. NCOS defines a set of capabilities or restrictions in table NCOS that allows or denies service.
SNPA	3 digits	Serving number plan area. Enter area code for this DN.
KEY	1 to 69	Enter number the DN will appear on.
RINGING	N	Ringing applied to this DN. Enter N for the PMD service. Only voice circuits have ringing applied.
LATANAME	NILLATA	Local access and transport name of DN. Enter LATA if applicable or NILLATA.
LTG	o to 9998	Line treatment group of DN. Enter LTG number of DN.
PILOT_LEN	Alphanumeric	Pilot Logical terminal identifier Consists of a Logical terminal group name, one space, and the terminal number. Enter LTID of the terminal this DN is on. From table LTDEF.

ISDN Packet Single DN (continued)

SERVORD prompts for ISDN Packet Single DN EST for establishing DLH or DNH hunt group with PMD call type pilot (Sheet 2 of 2)

Prompt	Valid input	Explanation
OPTION	PMD	Terminal set options. Enter PMD packet mode data PS service.
GROUPSIZE	numeric	Hunt group size. Enter size of hunt group that is being established.

Scenarios

The following set of SERVORD commands will add an NI2 type LTID, associate CS service CMD with DN 7235116 and key 1, and associate PS service PMD with DN 7235116 and key 7. This command set activates 2BD service and ISDN Packet Single DN.

Example of the SLT ADD command in non prompt mode—adding NI2 terminal with 2BD capabilities.

```
>SLT NOW 97 7 26 AM ISDN 20 ADD BRAFS NI2 D 64 N DTEI Y PVC
FUNCTIONAL 2
```

Example of the NEW command in non prompt mode-associating DN and key 1 on 2BD terminal with call type CMD

```
>NEW NOW 97 7 08 08 AM 7235116 ISDNKSET CUSTB 1 0 613 1 N
NILLATA ISDN 20 1 CMD 64 C521 6522 Y $
```

Example of the NEW command in non prompt mode-associating DN and key 7 on 2BD terminal with call type PMD

```
>NEW NOW 97 7 08 08 AM 7235116 ISDNKSET CUSTB 1 0 613 7 N
NILLATA ISDN 20 7 PMD $
```

The following set of SERVORD commands remove a DN from service. On LTID ISDN 20, packet switched (PS) PMD call type is de ned on k ey 2 and circuit switched (CS) CMD call type is de ned on key 1. One OUT command is used to remove the PMD service on ISDN 20, key 2. The DN will remain in service with only the CMD call type on key 1. If a second OUT command is issued to ISDN 20 key 1, the DN will be removed from service.

Note: In prompt mode the OUT command will issue a prompt for the key number of the service to be removed.

ISDN Packet Single DN (end)

Example of the OUT command in non prompt mode-removing DN 7235116 PMD call type service on LTID ISDN 20, key 2.

```
>OUT 7235116 ISDN 20 BLDN 2
```

Example of the OUT command in non prompt mode-removing DN 7235116 CMD call type service on LTID ISDN 20, key 1.

```
>OUT 7235116 ISDN 20 BLDN 1
```

Note: The following error message will be issued if the OUT command is issued to an integrated terminal without specifying the key.

```
***  ERROR - INCONSISTENT DATA  ***
INTEGRATED TERMINAL.  ENTER KEY VALUE.
```

ISDN Parameter Downloading - FPE and Messaging

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA010 and up

Prerequisites

ISDN Parameter Downloading - FPE and Messaging has no prerequisites.

Description

Parameter downloading (PD) allows the integrated services digital network (ISDN) terminal to send a register message to trigger the DMS-100 switch to program the ISDN terminal for the user. This is done by sending operating information, such as service information and directory number (DN) data, to the terminal in a series of facility messages.

The feature processing environment (FPE) portion of this feature addresses the state machine, data lookup, and XMS-based peripheral module-computing module (XPM-CM) communications involved with PD. Both versions 1 and 2 of PD are addressed by this feature.

The messaging portion of this feature is activated once a REGISTER message is sent from an ISDN fully initialized terminal (FIT). Once the REGISTER message is received by the XPM, it is converted to signaling control protocol (SCP) and sent to the CM.

This feature also provides functionality for ISDN Parameter Downloading Noti cation; ISDN Service K eywords and Descriptions Table; and ISDN Interface Con guration Changes.

ISDN Parameter Downloading Noti cation pro vides a mechanism by which terminal-related data can be downloaded to ISDN terminals from switch provisioned data tables. ISDN Parameter Downloading Noti cation sends a Q.931 NOTIFY message from the switch to an ISDN NI-2 initialized terminal whenever there is a change to any of the downloadable data associated with that terminal.

ISDN Parameter Downloading Noti cation identi es DMS feature keywords that are not the same as Bellcore feature keywords. The new table FEATDESC (Feature Description) uses the DMS keyword as an index and provides the corresponding Bellcore keyword. There are some DMS features

without corresponding Bellcore keywords. In such cases, the Bellcore keyword eld indicates NONE. Parameter downloading uses this table to nd the Bellcore feature keywords and user-alterable service descriptions that correspond to the DMS features on a user's terminal.

Operation

This feature deals with the CM portion of PD. The FPE portion looks up data used to program the terminal during downloading from various CM tables, and formats the data into various SCP messages. These SCP messages are then sent to the XPM, which subsequently reformats them into Common Management Information Service Element (CMISE) and Remote Operations Service Element (ROSE) Application Protocol Data Units (APDU) carried in Q.931 messages understandable by the terminal. The FPE and SCP portions of the capability are addressed by this feature. The FPE portion of this feature addresses the state machine, data lookup, and XPM to CM communications involved with PD. Both versions 1 and 2 of PD are addressed by this feature.

The FPE addresses the functionalities associated with PD. This includes PD FPE initiation including validity checks, processing the request successfully or rejecting it with proper responses, and cleanup. When a download failure occurs, an operation measurement (OM) from the new OM group, ISDNPDOM, is incremented and the ISDN302 log is generated, indicating the cause of the download failure.

Parameter downloading is initiated from the terminal with a REGISTER message. Upon receiving the REGISTER message from the Extended Peripheral Module (XPM), the FPE determines what services are required based upon the information registered against that particular terminal. After the REGISTER message is veri ed, call processing activity on that terminal is suspended. If the message content is correct, the data associated with that terminal is downloaded.

When the CM receives the message, the FPE activates PD. Parameter downloading FPR then busies out the terminal, which temporarily prevents

ISDN Parameter Downloading - FPE and Messaging (continued)

call processing on the terminal. Once this has occurred, the following information is sent to the XPM:

- DN independent data:
  - — CACH (Call Appearance Call Handling) indication
  - — FA-FI (Feature Activator - Feature Indicator) list information
  - — Intercom Group Appearance List
- DN dependent data:
  - — DN
  - — Originating DN Flag (only present in version 2)
  - — Bearer Capability List
  - — Directory Number Appearance Identi er List
  - — Call Reference Busy Limit List
  - — DN Dependent FA-FI Per Call Type Information
  - — Call Appearance Identi er List Information

Note: The MADN EKTS and circuit mode data (CMD) call appearances are sent in one message.

Once the terminal receives all the data, it sends a release complete (RELCOM) message and call processing is reactivated on that terminal.

The XPM extracts the data from the SCP message received from the CM. The XPM formats the data into CMISE/ROSE and sends it to the terminal in a series of FACILITY messages. When the nal bit of data has been sent to the terminal, the XPM sends a FACILITY message to the terminal indicating that PD is complete.

The XPM sets a PDL-T1 timer (for 5 seconds) to await a RELEASE COMPLETE reply from the terminal. If no RELCOM message is received during this time, then the XPM sends a RELCOM message to the terminal.

The XPM supports no more than 20 concurrent download requests. This agrees with the Bellcore real-time requirements for this feature.

Bellcore requires that the switch process and complete 90% of the download requests in less than 10 seconds. This time is measured from the receipt of a complete download request until the end of data indication is sent. As a minimum, the switch should be able to concurrently support a number of busy

hour download requests equal to 2% of the number of ISDN basic rate interfaces (BRI) on the switch.

Translations table o w

ISDN Parameter Downloading - FPE and Messaging does not affect translations table o w.

Limitations and restrictions

The following limitations and restrictions apply to ISDN Parameter Downloading - FPE and Messaging:

- Call processing is not available during parameter downloading.
- Parameter downloading is implemented only for NI-2 FITs.

Interactions

If Call Forwarding is active on an ISDN terminal when a download occurs, the forwarding functions as follows:

- Call Forward Busy, if active, continues to forward calls.
- Call Forward No Answer does not forward calls because the terminal is busy.
- Call Forward Variable continues to forward calls.
- Message waiting works with either Call Forward Busy or Call Forward No Answer; therefore, it continues to operate only in busy cases.

Activation/deactivation by the end user

ISDN Parameter Downloading - FPE and Messaging requires no activation or deactivation by the end user.

Billing

ISDN Parameter Downloading - FPE and Messaging does not affect billing.

Station Message Detail Recording

ISDN Parameter Downloading - FPE and Messaging does not affect Station Message Detail Recording.

Data lling of ce parameter s

ISDN Parameter Downloading - FPE and Messaging does not affect of ce parameters.

ISDN Parameter Downloading - FPE and Messaging (continued)

Data ll sequence

The following table lists the tables that require data ll to implement ISDN Parameter Downloading - FPE and Messaging. The tables are listed in the order in which they are to be data lled.

Data ll tab les required for ISDN Parameter Downloading - FPE and Messaging

Table	Purpose of table
FEATDESC	ISDN Service Keywords and Descriptions. This table contains DMS feature keywords, Bellcore keywords, and service descriptions. ISDN Parameter Downloading uses this table to find the Bellcore feature keywords and operating company alterable service descriptions that correspond to the DMS switch features on a user's terminal. Data from these tables are downloaded to NI-2 terminals using ISDN Parameter Downloading.
LTDEF	Logical Terminal Definition. This table identifies logical terminals and maps them to line equipment numbers (LEN) and terminal equipment interfaces (TEI). The logical terminal tables consist of tables LTCALLS, LTDATA, LTDEF, LTGRP, and LTMAP. Data from these tables are downloaded to NI-2 terminals using ISDN Parameter Downloading.
KSETFEAT	Business Set and Data Unit Feature. This table lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE. This table also lists the line features that are assigned to the Meridian digital telephone sets and DUs listed in table IVDINV. Data from these tables are downloaded to NI-2 terminals using ISDN Parameter Downloading.
KSETLINE	Business Set and Data Unit Line Assignment. This table contains the DN appearances for business sets and data units. One entry is required for each DN related to a key on a business set or a data unit. Data from these tables are downloaded to NI-2 terminals using ISDN Parameter Downloading as defined by AF6632.
MDNGRP	Multiple Appearance Directory Number Group. This table contains information associated with each MADN group and for each member of a MADN group, respectively. These are change-only tables. Tuples cannot be added to or deleted from these tables. Data from these tables are downloaded to NI-2 terminals using ISDN Parameter Downloading as defined by AF6632.
Note: ISDN Parameter Downloading relays the contents of these tables, if applicable, to an NI-2 terminal as they relate to a specific DN.	

Data lling tab le FEATDESC

The following table shows the data ll speci c to ISDN P arameter Downloading - FPE and Messaging for table FEATDESC. Only those elds that apply directly to ISDN Parameter Downloading - FPE and Messaging are shown. These elds do not require data ll. They are shown here as examples

of data that can be downloaded using feature ISDN Parameter Downloading - FPE and Messaging. For a description of the other elds, refer to the data schema section of this document.

FEATDESC eld descriptions

Field	Subfield or refinement	Entry	Explanation and action
FEATKEY		feature name	This field contains the name of the feature assigned to the key. This field cannot be modified.
BCRKEY		feature name and 1-8 numeric characters	This field specifies the feature name and the key to which it is assigned.
SERVDESC		1-20 characters	Service description. This is the only field that can be datafilled in this table. This field appears in two columns, MAP and ISDN terminal. The MAP column indicates table editor view at the MAP (maintenance and administration position) terminal. The ISDN terminal column indicates the subscriber's view at an ISDN terminal display.

The following table lists the default values for table FEATDESC.

FEATDESC default values (Sheet 1 of 2)

FEATKEY	BCRKEY	SERVDESC (MAP)	SERVDESC (ISDN terminal)
ACB	ACBT1	CALL_BACK	CALL BACK
PRV	BCEA	MAKE_CALL_PRIVATE	MAKE CALL PRIVATE
PRL	BCED	MAKE_CALL_PUBLIC	MAKE CALL PUBLIC
CIDSDEL	CIDSDLV	MAKE_ID_PUBLIC	MAKE ID PUBLIC
CIDSSUP	CIDSSUP	MAKE_ID_PRIVATE	MAKE ID PRIVATE
CPU	CPG1	CALL_PICKUP	CALL PICKUP
FC3	CFS3	CONFERENCE_SIZE_3	CONFERENCE SIZE 3
FC6	CFS6	CONFERENCE_SIZE_6	CONFERENCE SIZE 6

Note 1: SERVDESC (MAP) indicates table editor view at the MAP terminal.

Note 2: SERVDESC (ISDN terminal) indicates the subscriber's view at an ISDN terminal display.

ISDN Parameter Downloading - FPE and Messaging (continued)

FEATDESC default values (Sheet 2 of 2)

FEATKEY	BCRKEY	SERVDESC (MAP)	SERVDESC (ISDN terminal)
FC12	CFS12	CONFERENCE_SIZE_12	CONFERENCE SIZE 12
FC18	CFS18	CONFERENCE_SIZE_18	CONFERENCE SIZE 18
FC24	CFS24	CONFERENCE_SIZE_24	CONFERENCE SIZE 24
FC30	CFS30	CONFERENCE_SIZE_30	CONFERENCE SIZE 30
DROP	DROP	DROP_LAST_CALL	DROP LAST CALL
TRANSFER	TRF	CALL_TRANSFER	CALL TRANSFER
CFU	CFV	CALL_FORWARD	CALL FORWARD
PRK	CPRKR	RETRIEVE_PARKED_CALL	RETRIEVE PARKED CALL
MWT	MWI1	MESSAGE_WAITING	MESSAGE WAITING
AUD	$	AUTO_DIAL	AUTO DIAL
AUL	$	AUTO_LINE	AUTO LINE
EBO	$	E_BUSY_OVERRIDE	E BUSY OVERRIDE
MSB	$	MAKE_BUSY	MAKE BUSY
SCS	$	SPEED_CALL_SHORT	SPEED CALL SHORT
SCL	$	SPEED_CALL_LONG	SPEED CALL LONG
SCU	$	SPEED_CALL_USER	SPEED CALL USER
ICM	$	INTERCOM	INTERCOM

Note 1: SERVDESC (MAP) indicates table editor view at the MAP terminal.

Note 2: SERVDESC (ISDN terminal) indicates the subscriber's view at an ISDN terminal display.

Data ll e xample

The following example shows sample data ll for table FEA TDESC.

MAP display example for table FEATDESC

```
FEATKEY         BCRKEY              SERVDESC
_____________________________________________________
ACB             ACBT1               CALL_BACK
PRV             BCEA                MAKE_CALL_PRIVATE
TRANSFER         TRF                CALL_TRANSFER
```

Data lling tab le LTDEF

The following table shows the data ll speci c to ISDN P arameter Downloading - FPE and Messaging for table LTDEF. Only those elds that apply directly to ISDN Parameter Downloading - FPE and Messaging are shown. These elds do not require data ll. They are shown here as examples of data that can be downloaded using ISDN Parameter Downloading - FPE and Messaging. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le LTDEF

Field	Subfield or refinement	Entry	Explanation and action
CLASSREF			
	LTCLASS	BRAFS,BRAMFT,orPRA	Logical terminal class. This field identifies the set of services that are allowed for the logical terminal. For basic rate access functional sets, enter BRAFS. For basic rate access functional terminals, enter BRAMFT. For primary rate access, enter PRA.
	OPTION	AGA, CACH, CMD, DEFLTERM,DTEI, EKTS, ELN, NITYPE, NOCMD, NOPMD, NOVBD, NOVOICE, PMD, PVC, SCAI, SLBRI, SPIDSFX, TERML, TSPID, UATEI, UNATEI, VBD, VOICE	Option. Enter up to 18 options. Enter EKTS to indicate electronic key telephone service. Enter CACH to enable the call appearance handling feature on a terminal. This option cannot be assigned without option EKTS.

ISDN Parameter Downloading - FPE and Messaging (continued)

Data ll e xample for table LTDEF

The following example shows sample data ll for table L TDEF format DN.

MAP display example for table LTDEF

```
LTKEY   LTAP
                                                    CLASSREF
-------------------------------------------------------------
ISDN  322    B                  BRAFS   (EKTS )   (CACH )   $
```

Data lling tab le KSETFEAT

The following table shows the data ll speci c to ISDN P arameter Downloading - FPE and Messaging for table KSETFEAT. Only those elds that apply directly to ISDN Parameter Downloading - FPE and Messaging are shown. These elds do not require data ll. They are shown here as examples of data that can be downloaded using feature ISDN Parameter Downloading - FPE and Messaging. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le KSETFEAT

Field	Subfield or refinement	Entry	Explanation and action
FEATKEY		see subfields	KSET feature key. This field consist of subfields LEN, KEY, and FEAT.
	LEN	see subfields	Line equipment number. This field defines the physical location of the equipment that is connected to a specific telephone line. For ISDN lines, field LEN consists of subfield LTID. For non-ISDN lines, field LEN consist of subfields SITE, FRAME, UNIT, DRAWER or LSG, SHELF, SLOT, and CIRCUIT.
	KEY	1-69	Physical key. Enter the number associated with the physical key to which the feature is assigned. This must be a vacant key.
	FEAT	feature name	Feature name. Enter the name of the feature to be assigned.

Data ll e xample for table KSETFEAT

The following example shows sample data ll for table KSETFEAT. The rst tuple illustrates the LEN of the set is 00 0 02 04 at the host switching unit, and key 1 is assigned to the ACB feature. A position ID, 0123, is assigned to this supervisor position. The second tuple illustrates the LEN of the set is 00 0 03 05 at the host switching unit, and key 1 is assigned to the CPU feature.

MAP display example for table KSETFEAT feature SUPV

```
FEATKEY                    FEATURE
                                                        KVAR
-------------------------------------------------------------
HOST  00 0 02 04  1        ACB     ACB
HOST  00 0 03 05  1        CPU     CPU
```

Data lling tab le KSETLINE

The following table shows the data ll speci c to ISDN P arameter Downloading - FPE and Messaging for table KSETLINE. Only those elds that apply directly to ISDN Parameter Downloading - FPE and Messaging are shown. These elds do not require data ll. They are shown here as examples of data that can be downloaded using feature ISDN Parameter Downloading - FPE and Messaging. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le KSETLINE (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
KSETKEY		see subfields	Keyset key. This field consist of subfields LEN and KEY.
	LEN	see subfields	Line equipment number. This field defines the physical location of the equipment that is connected to a specific telephone line. For ISDN lines, field LEN consists of subfield LTID. For non-ISDN lines, field LEN consist of subfields SITE, FRAME, UNIT, DRAWER or LSG, SHELF, SLOT, and CIRCUIT.

ISDN Parameter Downloading - FPE and Messaging (continued)

Data lling tab le KSETLINE (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	KEY	1-69	Physical key. Enter the number associated with the physical key to which the feature is assigned. This must be a vacant key.
		DN	Format. Enter DN for regular directory number.

Data ll e xample for table KSETLINE

The following example shows sample data ll for table KSETLINE format DN. This example illustrates the following:

- The business set is assigned to LEN 03 1 14 12 in the host switching unit.
- The station number is 2265235 and is assigned to the PDN, call appearance 0.
- Ringing is applied to the set on termination.
- The station is assigned to subgroup 0 of customer group CGA.
- The station is assigned network class of service number 0.
- The station is assigned to home serving NPA 613.
- The station has options CWT (Call Waiting), 3WC (Three-way Calling), RAG (Ring Again), CFX (Call Forwarding), and MBS (Meridian business set).

MAP display example for table KSETLINE

```
          KSETKEY
                 Format
                                                  DNRESULT
                 KSFMTID
                      KSFMTARE
-------------------------------------------------------------
HOST  03 1 14 12  1
                       MDN   SCA  0 Y   Y      2265235
                       CGA   0       0 613
                       <    CWT> <    3WC> <  RAG> < CFX>$
                       MBS
```

Note: Fields KSFMTID and KSFMTARE are planned for a later software release.

Data lling tab le MDNGRP

The following table shows the data ll speci c to ISDN P arameter Downloading - FPE and Messaging for table MDNGRP. Only those elds that apply directly to ISDN Parameter Downloading - FPE and Messaging are shown. These elds do not require data ll. They are shown here as examples of data that can be downloaded using feature ISDN Parameter Downloading - FPE and Messaging. For a description of the other elds, refer to the data schema section of this document.

Data lling tab le MDNGRP (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
MDNKEY		see subfields	MADN key. This field consists of subfields AREACODE, OFCCODE, STNCODE, and CA is equal to fields SNPA and DN in tables IBNLINES or KSETLINE.
	AREACODE	0 to 9 (up to 7 digits)	Area code. This field is equal to the entry in field SNPA in table IBNLINES or KSETLINE.
	OFCCODE	0 to 9 (up to 7 digits)	Office code. This field is equal to the first part of the entry in field DN in table IBNLINES or KSETLINE.
	STNCODE	0 to 9 (up to 8 digits)	Station code. This field is equal to the last part of the entry in field DN in table IBNLINES or KSETLINE.
	CA	0 to 16	Call appearance. This field contains the CA group number. The default value is 0 for non-CACH and 1 for CACH.
RESULT		see subfields	Result. This field consists of subfields MDNTYPE, DENTRMT, CARES, PCA, BRIDGING, CONFSIZE, BRGTONE, INITSTAT, and PRLMODE.

ISDN Parameter Downloading - FPE and Messaging (continued)

Data lling tab le MDNGRP (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	MDNTYPE	EXB , SCA, MCA,CACH	MADN group type. Enter the type of call arrangement. Enter EXB (extension bridging) or SCA (single call arrangement) and datafill refinements DENTRMT and BRIDGING. Enter MCA (multiple call arrangement) and datafill no refinements. Go to field OPTLIST. Enter CACH (call appearance call handling) and datafill refinement DENTRMT. This field is equal to field MDNTYPE in table KSETLINE.
	DENTRMT	SILENCE, TONE	Denial treatment. If the entry in subfield MDNTYPE is EXB or SCA, datafill this refinement. This refinement specifies whether a tone is heard by a member who is not allowed to bridge into a call. If a tone is allowed, enter TONE. If a tone is not allowed, enter SILENCE.
	CARES	DOR, DTM, DTMEPI, NULL	Call appearance reservation type for the Call Appearance Group. This field can be assigned the following values: • DOR-Terminating Only • DTM-Originating Only • DTMEPI-Originating and Priority Incoming • NULL-Non-reserved (default)
	PCA	Y or N	Primary call appearance. Enter Y to designate that this is the primary call appearance for the DN.
	BRIDGING	Y or N	Bridging allowed. If the entry in subfield MDNTYPE is EXB or SCA, datafill this refinement. Enter Y (yes) if the MADN SCA group has bridging capability and datafill refinements CONFSIZE, BRGTONE, and INITSTAT. Otherwise, enter N (no) and go to field OPTLIST.

ISDN Parameter Downloading - FPE and Messaging (continued)

Data lling tab le MDNGRP (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	CONFSIZE	3 to 30	Conference bridge size. If the entry in refinement BRIDGING is Y, datafill this refinement. This refinement specifies the maximum conference bridge size in terms of parties (including the external party and the member who answered the call).
	BRGTONE	Y or N	Bridging tone. If the entry in refinement BRIDGING is Y, datafill this refinement. This refinement specifies whether a tone is heard by the external party and all active MADN members if a new member bridges into the call. To hear a tone enter Y. Otherwise, enter N and go to field OPTLIST.
	INITSTAT	PRIVATE, NONPRIVATE	Initial privacy status. If the entry in refinement BRIDGING is Y, datafill this refinement. If the entry in field MDNTYPE is EXB, enter NONPRIVATE. No refinements are datafilled. Go to field OPTLIST. If the entry in field MDNTYPE is SCA, enter PRIVATE. Datafill refinement PRLMODE.
	PRLMODE	MANUAL, AUTO	Privacy release mode. If the entry in refinement INITSTAT is PRIVATE, datafill this refinement. This refinement specifies the privacy release mode. The MANUAL mode allows only one member to bridge into the call after privacy has been explicitly released. The AUTO mode allows any members to bridge into the call after privacy is explicitly released.

Data ll e xample for table MDNGRP

The following example shows sample data ll for table MDNGRP .

ISDN Parameter Downloading - FPE and Messaging (continued)

MAP display example for table MDNGRP

```
MDNKEY                  GRPSIZE     RESULT              OPTLIST

------------------------------------------------------------------------
613   722   4396   1  4  CACH SILENCE NULL Y Y 30 N PRIVATE MANUAL $
613   722   4452   1  4  EXB   TONE   NULL Y Y 56 Y PRIVATE AUTO   $
```

Translation veri cation tools

ISDN Parameter Downloading - FPE and Messaging does not use translation veri cation tools.

SERVORD

SERVORD prompts

The following table shows the SERVORD prompts used to provision an NI-2 terminal and a primary DN to allow ISDN Parameter Downloading - FPE and Messaging.

SERVORD prompts for ISDN Parameter Downloading - FPE and Messaging (Sheet 1 of 2)

Prompt	Valid input	Explanation
FUNCTION	SLT	Set logical terminal command function.
LTID	Terminal ID	Logical terminal identifier.
FUNCTION	ADD	Add terminal command function.
LTCLASS	BRAFS	Logical terminal class. Enter BRAFS for basic rate access functional set.
MAXKEYS	64	Maximum number of keys on terminal.
EKTS	Y	Electronic key type service. Enter Y for 2BD service.
TEI_TYPE	DTEI	Dynamic terminal endpoint identifier. Enter dynamic TEI (DTEI) for 2BD service.
DEFLTERM	N	Default terminal. Enter N for 2BD service.
CS	NI2	Circuit switched. Enter NI2 to indicate an NI-2 terminal.
PS	N	Packet switched. Enter N to indicate non-packet switched terminal.

ISDN Parameter Downloading - FPE and Messaging (continued)

SERVORD prompts for ISDN Parameter Downloading - FPE and Messaging (Sheet 2 of 2)

Prompt	Valid input	Explanation
SPIDSFX	Numeric (up to 8 digits)	Service profile identifier suffix. Enter the number that uniquely identifies a particular subscriber on a dynamic TEI terminal.
DN	7 digits	Directory number. Enter DN to add call type.
LCC_ACC	ISDNKSET	Line class code access code. Enter ISDNKSET for NI-2 terminal.
GROUP	Group name	Customer group. Enter the customer group name that the DN belongs to from table CUSTGRP.
SUBGRP	0 to 7	Customer subgroup. Enter subgroup number of customer group.
NCOS	0 to 511	Network class of service. NCOS defines a set of capabilities or restrictions in table NCOS that allows or denies service.
SNPA	3 digits	Serving number plan area. Enter area code for this DN.
KEY	1 to 69	Enter number the DN appears on.
RINGING	Y or N	Ringing applied to this DN. Enter N for the PMD service. Only voice circuits have ringing applied.
LATANAME	NILLATA	Local access and transport name of DN. Enter LATA if applicable or NILLATA.
LTG	0 to 9998	Line treatment group of DN. Enter LTG number of DN.
LEN_OR_LTID	Alphanumeric	Logical terminal identifier Consists of a Logical terminal group name, one space, and the terminal number. Enter LTID of the terminal that this DN is on from table LTDEF.

SERVORD commands corresponding to ISDN Parameter Downloading - FPE and Messaging

SERVORD is used to provision an NI-2 terminal. Parameter downloading only works on NI-2 (and beyond) FITs. Data lling such a terminal requires the following steps.

The rst step is to pro vision the NI-2 terminal. This terminal should be provisioned for EKTS and have a SPID suf x (a terminal that supports multiple call appearances and group intercom).

ISDN Parameter Downloading - FPE and Messaging (continued)

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in prompt mode

```
> SLT
SONUMBER:  NOW  97 6 12 AM
>
LTID:
> <LTID>
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> NI2
PS:
> N
MAXKEYS:
> 64
DEFLTERM:
> N
TEI_TYPE:
> DTEI
EKTS:
> Y
OPTION:
> CACH
OPTION:
> SPIDSFX
SPID_SUFFIX:
> 01
OPTION:
> $
```

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in no-prompt mode

```
> SLT $ ADD BRAFS NI2 N 64 N DTEI Y (CACH) (SPIDSFX 01) $
```

The next step is to provision the primary DN.

ISDN Parameter Downloading - FPE and Messaging (continued)

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in prompt mode

```
> NEW
SONUMBER:  NOW 97 6 12 AM
>
DN:
> 7239999
LCC_ACC:
> ISDNKSET
GROUP:
> BNR
SUBGRP:
> 0
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
> Y
LATANAME:
> NILLATA
LTG: 0
> ISDN
LEN_OR_LTID:
> 200
OPTKEY:
> $
```

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in no-prompt mode

```
> NEW $ 7239999 ISDNKEYSET BNR 0 0 613 1 Y NILLATA 0 ISDN 200 $
```

To create a primary DN with multiple appearances input the following command series changing the OPTKEY parameter for each key assignment.

ISDN Parameter Downloading - FPE and Messaging (continued)

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in prompt mode

```
> NEW $ 7239998 ISDNKSET BNR 0 0 613 1 Y
NILLATA 0 ISDN 200
OPTKEY:
> 1
OPTION:
> CRBL
VI:
> 2
CMD:
> 3
OPTKEY:
> $
```

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in no-prompt mode

```
> NEW $ 7239998 ISDNKEYSET BNR 0 0 613
1 Y NILLATA 0 ISDN 200 (1 CRBL 2 3) $
```

In this example the primary DN is a MDN CACH Call Appearance.

ISDN Parameter Downloading - FPE and Messaging (continued)

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in prompt mode

```
> NEW
SONUMBER:  NOW  97 6 16 AM
>
DN:
> 7239999
LCC_ACC:
> ISDNKSET
GROUP:
> BNR
SUBGRP:
> 0
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
> Y
LATANAME:
> NILLATA
LTG:
> 0
LEN_OR_LTID:
> ISDN 200
OPTKEY:
> 1
OPTION:
> MDN
MDNTYPE:
> CACH
PRIMARY:
> Y
NEWCA:
> Y
CARES_TYPE: NULL
>
DENIAL_TRMT:
> TONE
BRIDGING:
> Y
OPTKEY:
> $
```

ISDN Parameter Downloading - FPE and Messaging (end)

SERVORD example for ISDN Parameter Downloading - FPE and Messaging in no-prompt mode

```
> NEW $ 7239999  ISDNKEYSET BNR 0 0 613 1 Y NILLATA 0 ISDN 200 (1
MDN CACH Y Y NULL TONE N) $
```

ISDN Redirection Services (CFW)

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

To operate, ISDN Redirection Services (CFW) has the following prerequisites:

- BAS Generic, BAS00003
- MDC Minimum, MDC00001
- MDC Standard, MDC00003
- RES Service Enablers, RES00006

Description

ISDN Redirection Services, or Call Forwarding (CFW), is enabled on NI-2 ISDN terminals for Basic Rate Interface (BRI) lines on a per directory number (DN) per call type (CT) basis by option CFXDNCT. Prior to this feature, ISDN subscribers could not forward differing call types to different locations. NI-2 ISDN Call Forwarding is not compatible with pre-NI-2 CFW for the same terminal.

Supported CFW subfeatures

The following CFW subfeatures can be added to a DN/CT appearance by option CFXDNCT:

- Call Forwarding Universal (CFU)
- Call Forwarding Intragroup (CFI)
- Call Forwarding Fixed (CFF)
- Call Forwarding Busy (CFB)
- Call Forwarding Don't Answer (CFD)
- Call Forwarding Remote Access (CFRA)
- CFB Universal (CBU)
- CFB Internal (CBI)
- CFB External (CBE)
- CFD Universal (CDU)

ISDN Redirection Services (CFW) (continued)

- CFD Internal (CDI)
- CFD External (CDE)

These CFW subfeatures are supported if they are provisioned by option CFXDNCT through the Service Order System (SERVORD). However, if these features are added to a terminal as options before option CFXDNCT is provisioned, option CFXDNCT cannot be added to the same terminal. These features cannot be added to a terminal as options if option CFXDNCT has already been provisioned. Option CFXDNCT must be used again to add the supported CFW subfeatures.

Changes from pre-NI-2 CFW

NI-2 ISDN Call Forwarding allows previous Call Forwarding functionality for ISDN BRI lines, with changes from pre-NI-2 CFW in the following areas:

- multiple call type forwarding
- activation
- validation
- reminder noti cation

Multiple call type forwarding

A single DN can have separate subscriptions to voice information (VI), circuit-mode data (CMD), and packet-mode data (PMD) CTs on an NI-2 ISDN device, and CFW is offered per DN per CT. NI-2 devices support multiple call appearances with distinct CTs for a DN. A terminal can forward call types VI and CMD to different destinations. Option CFXDNCT in table KSETFEAT provisions CFW by SERVORD.

Activation

CFW subfeatures are activated by a single feature activator (FA) depression, rather than the two key depressions required in pre-NI-2 CFW. An FA is a key assigned to a feature. An FA can be provisioned to apply to one CT only, and can apply to many DN call appearances.

Validation

NI-2 ISDN CFW introduces terminal option CFXVAL, which functions exactly the same as the pre-NI-2 customer group option CFWVAL. These options provide remote DN validation or courtesy call, or both. CFXVAL validates the call forward remote DN as well as the call type. Depending on the data entered, either DN validation or a courtesy call, or both, occur during programming of the remote DN. Option CFXVAL is data lled by SERVORD in table KSETFEAT. Prior to this feature, CFWVAL was the customer group option for group members provisioned with CFW in table CUSTSTN.

CFXVAL makes this same functionality available for each ISDN terminal. CFXVAL functionality takes precedence over CFWVAL if both options are provisioned.

Reminder noti cation

This functionality introduces a SERVORD prompt used to toggle Reminder Noti cation. P arameter NOTIFY is prompted for during the SERVORD addition of CFW subfeatures by option CFXDNCT. Reminder Noti cation applies only to subfeatures CFU, CFI, and CFF.

Operation

Multiple call type forwarding

Option CFXDNCT provides the e xibility to provision CFW on an NI-2 ISDN terminal in many different ways:

- All the supported CFW subfeatures can be added to an NI-2 ISDN terminal by option CFXDNCT for each DN/CT or for many DN/CTs.
- Option CFXDNCT can be provisioned on an NI-2 ISDN device to enable very e xible CFW behavior for VI and CMD call types.
- Option CFXDNCT provides the ability to have multiple CFW FAs provisioned on an NI-2 ISDN terminal, and each CFW FA has its own keylist of DNs of a single call type (VI or CMD).

Examples

Following are some examples of ways to provision CFW by option CFXDNCT:

- Multiple CFW FAs can be provisioned on an NI-2 terminal. Each FA can activate a single DN or a set of DNs according to call type (VI or CMD).

  Note: The PMD call type is not currently supported for CFW.

- Multiple CFW FAs can be provisioned for the same call type.

For example, an NI-2 terminal that has nine DNs of call type VI (each DN has more than one physical appearance) can be provisioned in a number of ways:

- Each DN of call type VI can be assigned CFW using one FA. This results in using nine CFW FAs on the terminal.
- One CFW FA can be provisioned for all VI DNs on the terminal.

ISDN Redirection Services (CFW) (continued)

- More than one CFW FA can be provisioned on the terminal, each providing CFW for one or more DNs. For example, if 3 CFW FAs are provisioned, each CFW FA could control 3 DNs for call type VI.

  Note: One DN cannot be associated with more than one FA unless the call type differs.

- A single FA can activate all DNs of a single call type on the terminal.

Activation

The following sections detail CFW activation.

Access code activation

Subfeatures CFB and CFD (control types F [x ed] and P [programmable]) cannot be activated by an FA depression. CFB and CFD (types F and P) are activated by a dial access code. The single FA depression activation method pertains to NI-2 terminals only. CFW feature activation on non-NI-2 ISDN terminal types requires a second FA depression after the remote digits are entered. This pre-NI-2 functionality does not change with this activity.

Subfeatures CFB and CFD of control type K (per key) are not supported with this feature. Subfeature CFK is not supported by this feature.

Single FA depression

CFU and CFI are activated by a single FA depression. This only applies to NI-2 terminals. CFW on non-NI-2 ISDN terminals requires a second FA depression after the remote digits are entered.

A timeout period is used to allow single FA depression. This timeout period is shorter than the timeout period used for non NI-2 terminals. A second FA depression cancels CFW activation (if made after CFW has been activated). If a second FA depression occurs during activation, it is ignored.

Activation for a DN/CT provisioned arrangement

The following gure sho ws an example of an NI-2 device provisioned for CFW according to DN/CTs. FA key 14 controls CFU, CFD, and CFB for voice calls on DN 1 only. FA key 15 controls CFU for data calls on DN 2 only. CFW subfeatures can be provisioned on this feature grouping basis according to voice or data, or they can be provisioned according to a keylist arrangement.

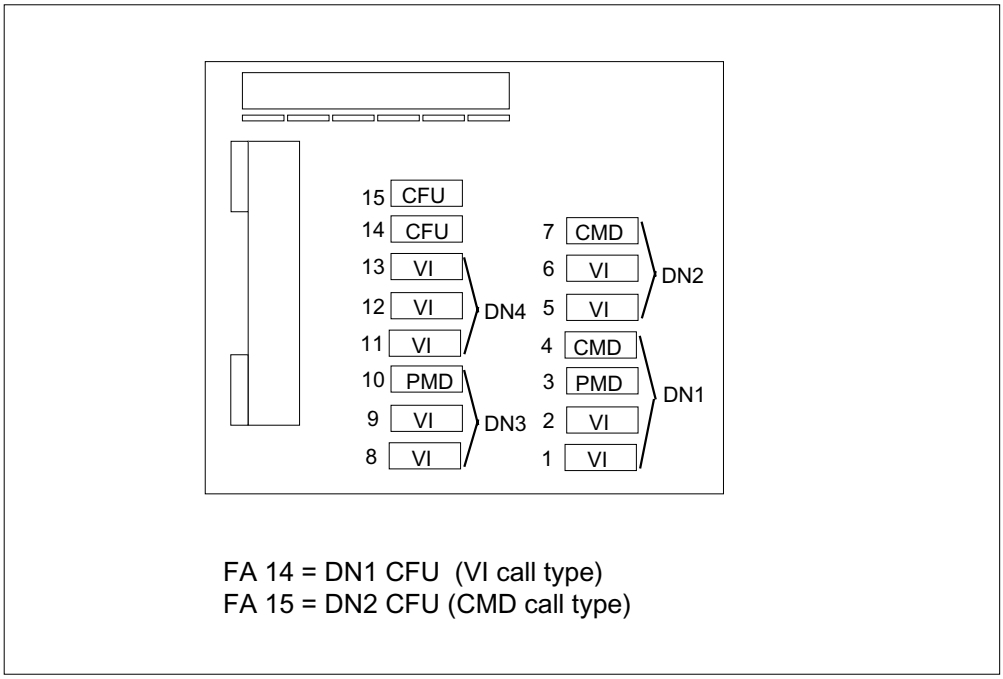
ISDN Redirection Services (CFW) (continued)

The following steps activate CFU for DN 1 (for VI CT).

1. Press the CFW FA for DN 1 (or DN 2), which is key FA 14 on the terminal.
2. Dial the digits of a remote DN to be forwarded to, or wait without dialing any remote digits (in which case the previously stored remote DN address digits are used).
3. The CFW FA indicator lamp is solidi ed on F A 14 of the user's terminal (if CFW validation is turned on by option CFWVAL or CFXVAL, and the remote DN entered is valid and is a valid candidate to received forwarded calls).

Note: If CFW validation is not turned on, remote DN validation is not performed and CFW is always activated.

NI-2 ISDN terminal con gured f or CFW on a single DN/CT subfeature basis



Activation via FA depression for a keylist provisioned arrangement

The following gure sho ws an example of an NI-2 device provisioned for CFW according to call types. FA key 14 is assigned to subfeature CFU to be applied to DN 1, DN 2, DN 3, and DN 4 for the VI call type. FA key 15 is assigned subfeature CFU to be applied to DN 1, DN 2, and DN 3 for the CMD call type.

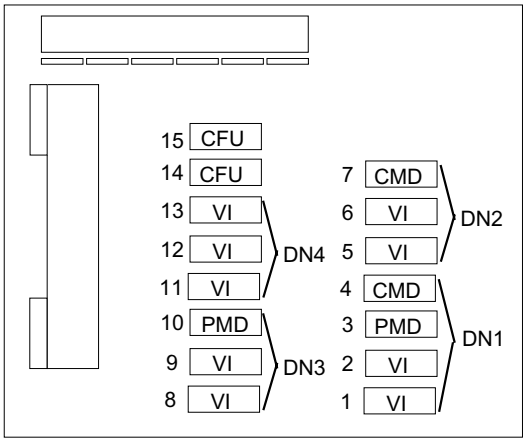
ISDN Redirection Services (CFW) (continued)

According to the following example, the following steps activate CFU for VI CTs:

1. Press the CFW FA 14, which enables CFW activation for all VI CT DNs in the keylist of option CFXDNCT assigned to FA 14 on the terminal.
2. Dial the digits of the remote DN/CT to be forwarded to, or wait without dialing any remote digits (in which case the previously stored remote DN/CT address digits are used).
3. The CFW FA indicator lamp is solidi ed on F A 14 of the user's terminal (if CFW validation is turned on by option CFWVAL or CFXVAL, and the remote DN/CT entered is valid [the CT of the remote DN/CT must match the CT of the CFW base terminal as well] and is a valid candidate to received forwarded calls).

Note: If CFW validation is not turned on, remote DN validation is not performed and CFW is always activated.

NI-2 ISDN terminal con gured f or CFW on a DN/CT list basis



FA 14 = DN 1, DN 2, DN3, DN 4 have CFU for VI call type
FA 15 = DN 1, DN2, DN 3 have CFU for CMD call type

Activation outside call context (while active on call)

CFW activation outside the context of the call means activating CFW by an FA depression separate from any active call or without an active call on the terminal. Activation in the presence of active calls is only possible if the FA depression generates a null call reference.

ISDN Redirection Services (CFW) (continued)

In the previous example, a user can activate CFW while active on a call on a VI DN/CT appearance of the CFW base by doing the following:

1. Put the call on hold.
2. Press the CFW FA on FA 14 to initiate CFW activation for DNs 1, 2, 3, and 4 on the terminal.
3. Enter the remote digits, or allow the CFW activation to timeout (which defaults to the previously stored remote digits).

Programming CFW to a previously stored DN

NI-2 ISDN terminal users can program CFW to a remote number that was used during the previous CFW activation. Programming is done by a single CFW FA depression (inside or outside call context) and is satis ed by pre-NI-2 functionality.

The following changes are made to CFW programming with ISDN Redirection Services:

- The initial time-out period (started by depression of the FA) expires without remote digit entry by the user. This triggers the retrieval of the previously stored number.
- If no remote DN has been stored previously (this is the rst CFW activation attempt since CFW was provisioned on the terminal), CFW does not activate.
- The length of time between FA depression and the requisite timeout expiry (that results from no subsequent digit entry) is shortened.
- Of ce parameter LN_LONG_PARTIAL_DIAL_TIME is used as the value for the timer started when the FA key is pressed. LN_SHORT_PARTIAL_DIAL_TIME is used as the interdigital timer as digits are dialled. Both of these parameters are de ned in table OFCENG.
- Remote digits are not entered during CFW activation to a previously stored CFW remote.
- CFW activation to a previously stored number can also be performed outside the call context.

Activation by dial access

CFB and CFD (types F and P) are activated by dial access. According to the rst gure, FA 14 is assigned CFU, CFD, and CFB for DN 1 VI call type. FA 15 is assigned CFU for DN 2 CMD call type.

ISDN Redirection Services (CFW) (continued)

An NI-2 terminal user can activate CFU on DN 1 for call type VI by doing the following:

1. Go off-hook on DN 1 or DN 2.
2. Dial the CFW feature activator code to initiate CFW activation (de ned in table IBNXLA).
3. After receiving special dial tone, dial the digits of the remote DN/CT.
4. A con rmation tone is returned to the user (for the VI call type only) and the CFW FA indicator lamp is toggled on FA 14 if
   - CFW validation is turned on (by CFWVAL or CFXVAL) and
   - the remote's address digits are valid and
   - the remote DN/CT is a valid candidate to receive forwarded calls.

Note: If CFW validation is not turned on, remote DN validation is not performed and CFW is always activated. Con rmation tone is not given for CMD programming.

Validation

The functionality of terminal option CFXVAL is identical to the pre-NI-2 customer group option CFWVAL provisioned in table CUSTSTN. These options permit routing and terminating validation of the forwarding DN when the user activates CFW.

With routing validation, the forwarding DN is validated to determine if the number is routeable. Before NA012, if eld TERMOPT = N routing validation occurred. Beginning with NA012, if eld TERMOPT is set to ANSRQC, ANSRQNC, NANSR, or NECC routing validation occurs for calls forwarded from NI-2 sets. With terminating validation (or courtesy call), the forwarding DN is validated so that termination on the forwarding DN is completed. CFW activation remains the same. Con rmation tone signals that the forw arding DN was successfully stored and validated according to the value of eld TERMOPT.

CFW validation is performed during CFW activation. When programming the CFW remote DN, validation is completed before successful activation of CFW. If the remote DN passes validation, the remote DN is stored and CFW is activated to that remote DN/CT for CFW subscribers.

Validation is available for both the VI and CMD call types. The remote DN's route and the ability of the remote DN to accept an incoming call are validated before storing the call-forwarded DN. This includes validation of the remote

DNs that are activated by an FA or code access. This capability applies to multiple DN/CTs provisioned on an NI-2 ISDN terminal.

The CT of the destination DN appearance is validated to ensure that it is compatible with the CT of the CFW base CT. Validation disallows CFW activation attempts if the call type of the CFW base does not match the call type of the CFW remote.

Differences with CFWVAL and CFXVAL

The options are provisioned differently. CFXVAL is a terminal option provisioned in table KSETFEAT by SERVORD. CFWVAL is a customer group option provisioned in table CUSTSTN by table control CFXVAL is added once for each LTID that requires validation.

CFXVAL functionality always supersedes that of CFWVAL if both are provisioned. For example, if customer group option CFWVAL is set for a courtesy call but terminal option CFXVAL is set to route a call, then routing validation takes place (not the courtesy call).

Terminal option CFXVAL is allowed to be added to a set even if no other CFW subfeatures are assigned to the device. If no CFW features are on the set, CFXVAL does not add any functionality. If a pre-NI-2 CFW feature is provisioned on an NI-2 device, CFXVAL is allowed to be provisioned. Validation takes place on either NI-2 *or* pre-NI-2 CFW.

CFXVAL and CFXDNCT are provisioned independently of one another and do not require the appearance of the other to function. CFXVAL and CFXDNCT can appear together on the same terminal.

The following table shows that CFXVAL functionality supersedes that of CFWVAL.

Function performed when options CFXVAL and CFWVAL assigned (Sheet 1 of 2)

		Option CFWVAL		
		Not datafilled	**TERMOPTN = Y**	**TERMOPTN = N**
	Not provisioned	No validation	Courtesy call	Route verified
Option CFXVAL	*ANSRQC*	Courtesy call	Confirmation indicator	Route verified

ISDN Redirection Services (CFW) (continued)

Function performed when options CFXVAL and CFWVAL assigned (Sheet 2 of 2)

	Option CFWVAL		
	Not datafilled	**TERMOPTN = Y**	**TERMOPTN = N**
ANSRQNC	Courtesy call	No confirmation indicator	Route verified
NANSR	Courtesy call	No answer required	Route verified
NECC	No courtesy call	Not applicable	Route verified

Terminating validation (courtesy call)

If parameter TERMOPT is set to ANSRQC, ANSRQNC, OR NANSR during a SERVORD addition or change of CFXVAL, then a courtesy call is made to the remote DN when a user programs CFW from the terminal via a dial access code.

If the call is answered during a CFW activation attempt, CFW becomes active for the base station. If the courtesy call goes unanswered or receives a busy signal and a second courtesy call attempt is made within 2 minutes of the rst, CFW becomes active for the base station.

Courtesy call is supported for both the VI and CMD call types. Courtesy call is not supported for CMD. Route validation is performed and if the validation passes, the CFXDNCT a vor is activated.

Routing validation

If parameter TERMOPT is set to NECC during a SERVORD addition or change of CFXVAL, then the forward-to remote DN's route is veri ed (and a courtesy call is not made to the remote DN when a user programs CFW from the terminal). This capability applies to multiple DNs per CTs provisioned on an NI-2 ISDN terminal. Translations from the base station are validated, and if the translations pass validation, CFW becomes active for the base station. If the translations do not pass for the remote DN, CFW does not become active for the base. The user does not attempt to terminate on the forwarding DN. The forwarding DN is just determined to be routeable. If the dialed digits are not routeable, then reorder tone is heard.

Customer group validation during CFB and CFD activation

Options CFWVAL and CFXVAL check the customer group of the CFW base DN/CT and the CFW remote DN/CT to ensure both DN/CTs are in the same customer group. This check occurs for subfeatures CFB and CFD during CFW activation. The CFB and CFD subfeatures must have programmable control to use this functionality. The customer group check includes the customer group transparency feature functionality when determining customer group validation.

Reminder noti cation

The pre-NI-2 CFW reminder noti cation feature is pro visioned by option CFXFEAT in table CUSTSTN. Option CFXFEAT provides a switching mechanism that turns on Reminder Noti cation for Intragroup Call Forwarding for CFU, CFF, and CFI on a Customer Group basis. When the CFXFEAT parameter RINGCFI is set to Y, calls forwarded to an Intragroup remote destination enable the CFW base to receive a ring splash for all terminals in the affected customer group. Calls forwarded to an Intergroup remote destination enable an NI-2 CFW base terminal to receive a ring splash for any setting of the CFXFEAT parameter RINGCFI.

NI-2 terminals can also use CFXFEAT to provide Reminder Noti cation if NI-1 call forward is provisioned on them. CFXFEAT is not applicable to NI-2 CFW.

Reminder Noti cation for NI-2 ISDN terminals uses a ne w toggle method. Parameter NOTIFY, prompted for during the SERVORD addition of option CFXDNCT (subfeatures CFU, CFF, or CFI), provides the toggle mechanism for CFW reminder noti cation. NO TIFY functionality is applicable to NI-2 CFW only.

An active CFW base NI-2 ISDN DN/CT appearance receives a reminder when a call is forwarded to the remote DN/CT only if the NOTIFY parameter provisioned with the CFXDNCT option is set to Y.

Note: Terminal rmw are provides the audible buzz and display update during CFW Reminder Noti cation. A terminal must have rmw are capable of providing buzz and display updating during Reminder Noti cation for CFXFEAT or NOTIFY to function.

Translations table o w

The ISDN Redirection Services (CFW) translations tables are described in the following list:

- Table KSETFEAT (Business Set and Data Unit Features) lists the line features that are assigned to the business sets and data units in table

ISDN Redirection Services (CFW) (continued)

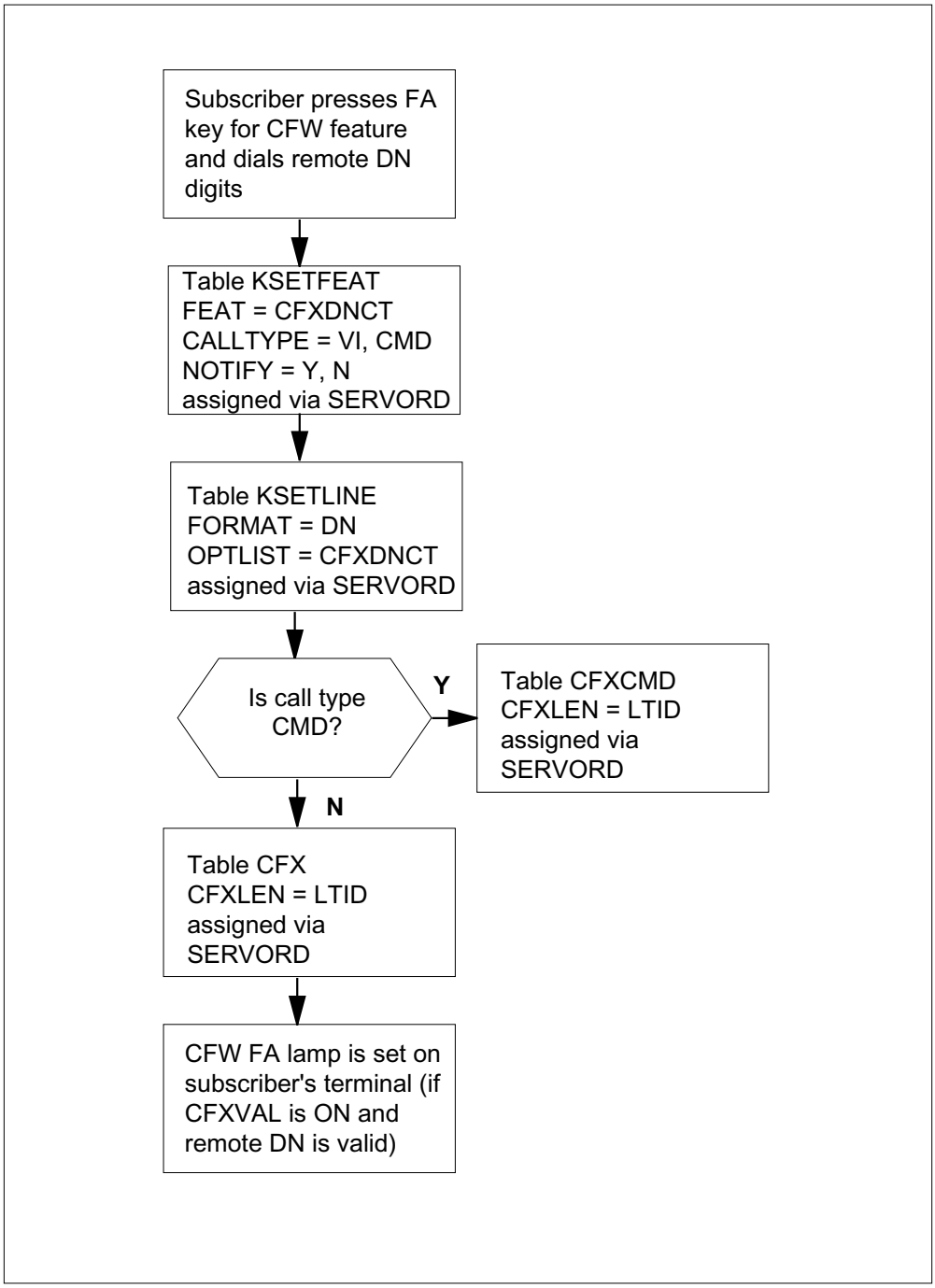
KSETLINE. Option CFXDNCT, the call type, and reminder notification are automatically updated in table KSETFEAT when assigned by SERVORD. Option CFXVAL, courtesy call, and route validation are automatically updated in table KSETFEAT when assigned by SERVORD.

- Table KSETLINE (Business Set and Data Unit Line Assignment) contains the DN appearances for business sets and data units. One entry is required for each DN-related key on a business set and a data unit. The key is the LTID. Option CFXDNCT is automatically updated in this table when assigned by SERVORD.
- Table CFX (Call Forwarding) formats and displays CFW information on the basis of individual LENs and keys for VI call type information and non-call type specific information. This table indicates whether the CFW feature on a line is active or inactive and the DN to which it is forwarding. Option CFXDNCT and its associated CFW subfeatures for the VI call type are automatically updated in this table when assigned by SERVORD.
- Table CFXCMD (Call Forwarding Circuit Mode Data) is a repository for CFW data storage for call type CMD for NI-2 and NI-3 ISDN terminals. Option CFXDNCT and its associated CFW subfeatures for the CMD call type are automatically updated in this table when assigned by SERVORD.

The ISDN Redirection Services (CFW) translation process is shown in the flowchart that follows.

ISDN Redirection Services (CFW) (continued)

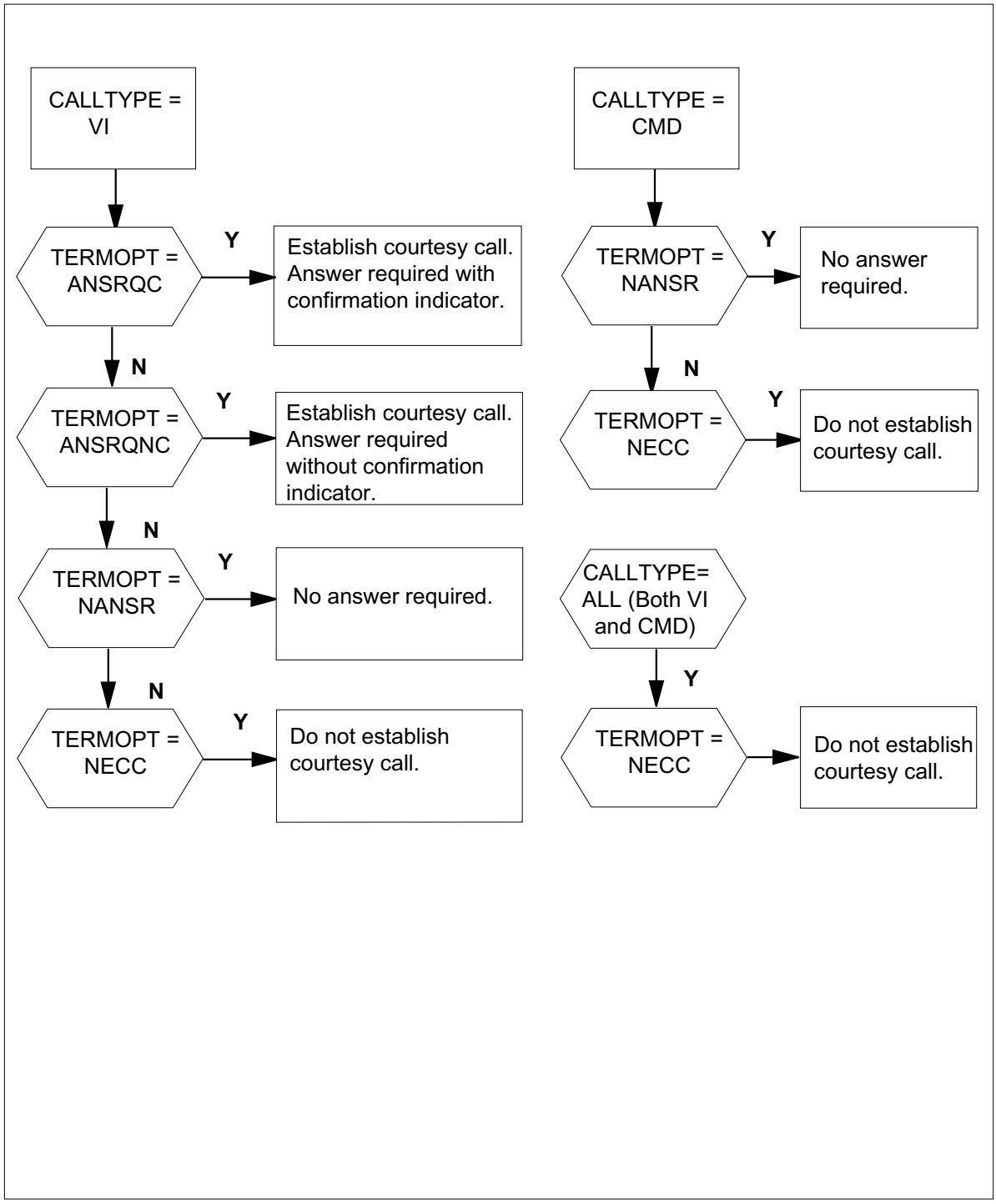
Table o w for option CFXDNCT



The ISDN Redirection Services (CFW) option CFXVAL translation process is shown in the flowchart that follows.

ISDN Redirection Services (CFW) (continued)

Table o w for option CFXVAL



The following table lists the datafill content used in the flowcharts.

Data ll e xample for ISDN Redirection Services (CFW)

Datafill table	Example data
KSETFEAT	ISDN 1 14 CFXDNCT CFXDNCT CFU N 6 CFB P N N (1,5) VI $ ISDN 1 1 CFXVAL CFXVAL (VI NECC) (CMD NECC) $
KSETLINE	ISDN 1 1 DN Y 2265235 BNRTST1 0 0 613 (CFXDNCT) $
CFX	ISDN 1 1 Y N I $ N
CFXCMD	ISDN 1 1 Y N I $ N

Limitations and restrictions

The following limitations and restrictions apply to ISDN Redirection Services (CFW):

- Options CFXDNCT and CFXVAL are exclusive to NI-2 ISDN terminals.
- ISDN Redirection Services is not compatible with pre-NI-2 CFW for the same terminal.
- The CFW subfeatures CFU, CFI, CFF, CFRA, CFB, CFD, CBE, CBI, CBU, CDE, CDI, and CDU are supported only if they are provisioned through option CFXDNCT. If these features are added to a terminal as options before CFXDNCT is provisioned, CFXDNCT cannot be added to the same terminal. These features cannot be added to a terminal as options if CFXDNCT has already been provisioned. CFXDNCT must be used again to add the CFW subfeatures.
- The CFW sub-feature CFF, CFI, or CFU must be present on the line provisioned by option CFXDNCT before CFXDNCT can provision CFRA. Sub-feature CFRA applies to voice (VI) call types only.
- CFF is assignable to a DN/CT appearance. CFF cannot be assigned by an FA. CFF is activated by dial access only.
- CFK is not supported by option CFXDNCT.
- CFB and CFD control type K are not supported with option CFXDNCT.
- The following terminal options prohibit termination to a CFW remote terminal and cause the CFWVAL option to disallow CFW activation: Denied Termination (DTM), Suspend Service (SUS), Plug Up (PLP), Requested Suspension (RSUS), Denied Incoming (DIN), and Denied Call Forwarding (DCF).
- You cannot change the call type associated with a CFXDNCT FA with the CHF or ADO commands. To change the call type of an existing

ISDN Redirection Services (CFW) (continued)

CFXDNCT FA, the option CFXDNCT must be removed and then re-added.

- Option CFXDNCT provisioning for VI and CMD cannot share the same FA key or DN appearance. Each CFW instance must reside on a separate virtual key. For example, CFW for the VI CT and CFW for the CMD CT cannot both be provisioned on the PDN. Only one can be provisioned on the PDN, and the other can be provisioned on an FA that has a keylist containing the PDN. Both can be provisioned on separate FAs that have keylists containing the PDN.
- The number of digits in a DN appearance on a base station is limited to 10 digits, and the number of DNs in a DN list is limited to 4.
- Option CFXVAL is allowed to be provisioned even if a pre-NI-2 CFW feature is provisioned on the same NI-2 terminal.
- CFXVAL must be assigned to a DN appearance of key 1.
- Assignment of CFXVAL to a feature key (FA) is not allowed.
- The maximum number of TERMOPT values assigned to a terminal is two. The first value is for call type VI and the second value is for call type CMD.
- The only valid SERVORD entries for CFXVAL TERMOPT value for call type ALL are NANSR and NECC.
- CFXVAL TERMOPT values ANSRQC and ANSRQNC are not supported for the CMD CT.
- The CHF command can not be used to change the CT associated with CFXVAL. The only way to change the CT of an existing CFXVAL option is to remove and then re-add option CFXVAL using SERVORD.

Interactions

The following paragraphs describe the interactions between ISDN Redirection Services (CFW) and other functionalities.

Attendant Console (AC) Call Forward Station (CFS)

Attendant Console (AC) CFS to an NI-2 ISDN terminal with option CFXDNCT is not allowed. The AC display shows *disallowed* for an attempted CFS to an NI-2 ISDN terminal with option CFXDNCT.

Automatic Call Back/Automatic Recall (ACBAR)

ACBAR attempts to a busy CFW base station fail with call type CMD. These calls receive the treatment *unexpected data value* in the transaction capabilities application part (TCAP).

ISDN Redirection Services (CFW) (continued)

Call Forward Per Key (CFK)

Option CFXDNCT is incompatible with CFK.

Call Forward Busy/Call Forward Don't Answer Per Key Destination

Option CFXDNCT is incompatible with CFB/CFD Per Key Destination.

Call Management of Call Forwarding (CMCF)

Option CFXDNCT is incompatible with CMCF.

Bridged Night Number (BNN)

Option CFXDNCT is incompatible with BNN.

Call Forward for Secondary MADN Member (CFMDN)

Option CFXDNCT is incompatible with CFMDN.

Call Forward Timed for CFB (CFTB)

Option CFXDNCT is incompatible with CFTB.

Call Forward Timed for CFD (CFTD)

Option CFXDNCT is incompatible with CFTD.

Circuit Switched Digital Data Service (CSDO/CSDDS)

Option CFXDNCT is incompatible with CSDO/CSDDS.

Distributed Line Hunting (DLH)

Option CFXDNCT is incompatible with DLH.

Directory Number Hunting (DNH)

Option CFXDNCT is incompatible with DNH.

Free Number Terminating (FNT)

Option CFXDNCT is incompatible with FNT.

Hotel/Motel (HOT)

Option CFXDNCT is incompatible with HOT.

Inhibit Ring Reminder (IRR)

Option CFXDNCT is incompatible with IRR.

Internal/External for CFB (IECFB)

Option CFXDNCT is incompatible with IECFB.

ISDN Redirection Services (CFW) (continued)

Internal/External for CFD (IECFD)

Option CFXDNCT is incompatible with IECFD.

Line Appearance on a Digital Trunk Public Safety Answering Point (LDTPSAP)

Option CFXDNCT is incompatible with LDTPSAP.

Multiline Hunting (MLH)

Option CFXDNCT is incompatible with MLH.

Network Resource Selector (NRS)

Option CFXDNCT is incompatible with NRS.

Operator Number Identi cation (ONI)

Option CFXDNCT is incompatible with ONI.

Packet Mode Data (PMD)

Option CFXDNCT is incompatible with PMD.

Preferential Hunt (PRH)

Option CFXDNCT is incompatible with PRH.

Pre-NI-2 Call Forwarding

Pre-NI-2 CFW functionality can exist on an NI-2 ISDN terminal. Both pre-NI-2 and NI-2 CFW functionality cannot coexist.

All pre-NI-2 CFW interactions still apply. See the appropriate feature descriptions in this manual.

Selective Call Forwarding (SCF)

Option CFXDNCT is incompatible with SCF.

Terminating Billing Option (TBO)

Option CFXDNCT is incompatible with TBO.

Terminating Billing Option on Hunt Group (TRMBOPT)

Option CFXDNCT is incompatible with TRMBOPT.

Activation/deactivation by the end user

CFU and CFI for NI-2 ISDN terminals is activated by a single FA depression. CFB and CFD (types F and P) are activated by dial access code.

Activation of CFU and CFI by the end user

At your telephone

1 Press the CFW FA key for the DN you want to forward.

Response:

Flashing indicator lamp

2 Dial the digits of the remote DN to forward calls to, or wait without dialing any remote digits (in which case the previously stored remote DN address digits are used).

Response:

The CFW FA indicator lamp is solidi ed on the CFW F A key of the user's terminal (if CFW validation is turned on by option CFWVAL or CFXVAL, and the remote DN entered is valid and is a valid candidate to received forwarded calls).

Billing

ISDN Redirection Services (CFW) does not affect billing.

Station Message Detail Recording

ISDN Redirection Services (CFW) does not affect Station Message Detail Recording.

Data lling of ce parameter s

ISDN Redirection Services (CFW) does not affect office parameters.

Data ll sequence

NI-2 ISDN Call Forwarding does not affect datafill sequence.

Translation veri cation tools

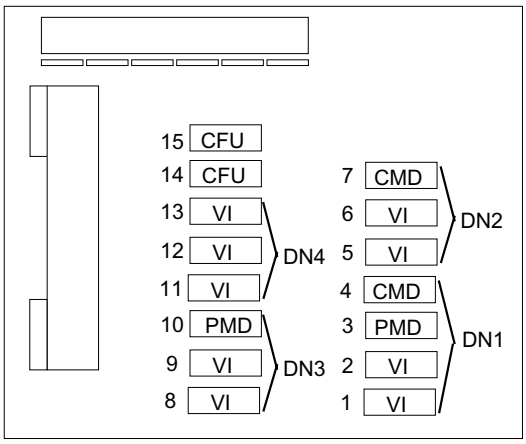
ISDN Redirection Services (CFW) does not use translation verification tools.

SERVORD

The following figure shows an example configuration of option CFXDNCT on an NI-2 ISDN set. FA 14 can be provisioned with a list of DNs (or DN appearances) that contain all or some of the VI call type DN appearances. If DNs 1 and 2 are selected during provisioning, the keylist stored in table KSETFEAT is CRBL master keys 1 and 5.

FAs 15 and 16 can be provisioned for either CMD or VI in the same manner. Multiple FAs can be assigned by option CFXDNCT—up to one appearance for each DN/CT pair.

ISDN Redirection Services (CFW) (continued)



FA 14 = can be provisioned to offer CFW for CT VI on DNs 1 & 2
FA 15 = can be provisioned to offer CFW for CT CMD for DNs 1, 2, 3, & 4
FA 16 = can be provisioned to offer CFW for CT VI for DNs 3 & 4

For NI-2 ISDN CFW functionality, options CFXDNCT and CFXVAL are provisioned by SERVORD. These options operate independently of one another, and do not require one another to function.

Option CFXDNCT

CFW subfeatures CFU, CFI, CFF, CFRA, CFB, CFD, CBU, CBI, CBE, CDU, CDI, and CDE are added by option CFXDNCT for NI-2 terminals. SERVORD ensures that supported CFW features are added by option CFXDNCT if at least one appearance of CFXDNCT has been provisioned. For example, if CFU has been provisioned on an NI-2 device by option CFXDNCT, then an ADO of CFB is disallowed. CFB must also be added using CFXDNCT.

The DNs entered as the forwarding DNs are converted to a keylist by SERVORD. The check procedures for the SERVORD transaction look for all the appearances of a DN call type pair on an NI-2 device and create a keylist.

SO commands used with CFXDNCT

Option CFXDNCT is added by the ADO or NEW command. The OPTKEY prompt assigns the FA or DN. When a QLT command is done, CFXDNCT appears as a subset option assigned to a key. CFXDNCT is deleted by the DEO command. The same OPTKEY specified during ADO or NEW is required during the deletion. The CHF command can be used to change the feature.

Option CFXVAL

Option CFXVAL takes precedence over pre-NI-2 customer group option CFWVAL.

SO commands used with CFXVAL

Option CFXVAL is added by the ADO or NEW command. At the OPTKEY prompt, a DN appearance of key 1 (not an FA) must be specified. When a QLT command is done, CFXVAL appears to be assigned as a terminal option. CFXVAL is deleted by the DEO command. This does not delete or negate the pre-NI-2 customer group option CFWVAL, if provisioned. The CHF command can be used to change the feature.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to ISDN Redirection Services (CFW):

- The CFW subfeatures CFU, CFI, CFF, CFRA, CFB, CFD, CBE, CBI, CBU, CDE, CDI, and CDU are supported only if they are provisioned through option CFXDNCT. If these features are added to a terminal as options before CFXDNCT is provisioned, CFXDNCT cannot be added to the same terminal. These features cannot be added to a terminal as options if CFXDNCT has already been provisioned. CFXDNCT must be used again to add the CFW feature and subfeatures.
- The CFW sub-feature CFF, CFI, or CFU must be present on the line provisioned by option CFXDNCT before CFXDNCT can provision CFRA. Sub-feature CFRA applies to voice (VI) call types only.
- If CFW is not provisioned by option CFXDNCT for an NI-2 device, CFW reverts to pre-NI-2 CFW functionality. (CFW subfeatures are added as options through SERVORD, not through option CFXDNCT.)
- If PMD shares the same DN as a VI or CMD call type, a dollar sign ($) cannot be used to indicate that all DNs of a device are selected in a SERVORD transaction. Each DN appearance must be entered manually for assignment of CFXDNCT on the VI and CMD appearances.
- Option CFXDNCT for the VI and CMD call types cannot share the same FA key or DN appearance. Each CFW instance must reside on a separate virtual key. For example, CFW for the VI CT and CFW for the CMD CT cannot both be provisioned on the PDN. Only one can be provisioned on the PDN, and the other can be provisioned on an FA that has a keylist containing the PDN. Both can be provisioned on separate FAs that have keylists containing the PDN.
- The number of digits in a DN appearance on a base station is limited to 10 digits, and the number of DNs in a DN list is limited to 4.

ISDN Redirection Services (CFW) (continued)

- A CMD DN/CT pair cannot be included in a VI call type keylist, and a VI DN/CT pair cannot be included in a CMD call type keylist.
- A DN appearance is not allowed in more than one keylist at a time.
- Courtesy call only applies to both the VI and CMD call types. Validation is available for both VI and CMD.
- At the DN_OR_KEYLIST prompt of option CFXDNCT, if the entries are DNs, only the DN keys that match the call type already specified are provisioned with CFW. For example, if CMD was specified at the CALLTYPE prompt and DNs 6215000 and 6215001 are entered, only the CMD appearances (not the VI) on DNs 6215000 and 6215001 are assigned CFW. If the entries are keys, the specified keys must be the Call Reference Busy Limit (CRBL) master key of each DN appearance. Specifying Additional Functional Call (AFC) appearances fails.

SERVORD prompts

The following table shows the SERVORD prompts used to add options CFXDNCT and CFXVAL to an LTID.

Note: Tables KSETFEAT, KSETLINE, CFX, and CFXCMD are automatically updated when option CFXDNCT is added, changed, or deleted by SERVORD. Table KSETFEAT is automatically updated when option CFXVAL is added, changed, or deleted by SERVORD.

SERVORD prompts for ISDN Redirection Services (CFW) (Sheet 1 of 4)

Prompt	Valid input	Explanation
DN_OR_LEN		Specifies the LTID of the NI-2 device to which CFW will be assigned
OPTKEY	1-64 for CFXDNCT, 1 for CFXVAL	Specifies the FA or DN on the ISDN set to which the option is assigned
OPTION	CFXDNCT, CFXVAL	Specifies the option associated with a service to be established, modified, or deleted from the specified LTID
CALLTYPE	VI, CMD	Specifies the CT of the DN or DNs you want to assign to a CFW keylist ***Note:*** Specify a keylist of all VI or CMD keys by entering VI or CMD as the CALLTYPE and $ at the first DN or KEY prompt.

ISDN Redirection Services (CFW) (continued)

SERVORD prompts for ISDN Redirection Services (CFW) (Sheet 2 of 4)

Prompt	Valid input	Explanation
	ALL, CMD, VI, $	Specifies the CT to which CFXVAL is assigned. An entry of ALL specifies both CMD and VI call types. $ indicates no further input.
CFXTYPE	CFU, CFI, CFF, CFB, CFD, CFRA, CBU, CBI, CBE, CDU, CDI, CDE	Specifies the CFW subfeature to be assigned
OVRDACR	Y, N	Specifies whether override for account code is required (datafill for CFU)
CFBCNTL	F, P, N	Specifies the type of CFB control. F is fixed assignment for CFB; N is normal (default) assignment for CFB; and P is programmed assignment for CFB. (datafill for CFB)
CFBDN	up to 30 digits	Specifies the call forwarding DN for CFB option (prompt appears when CFBCNTL = F or N)
CFFDN	up to 30 digits	Specifies the call forwarding DN for CFF option (datafill for CFF)
CFDCNTL	F, P, N	Specifies the type of CFD control. F is fixed assignment for CFD; N is normal (default) assignment for CFD; and P is programmed assignment for CFD. (datafill for CFD)
CFDDN	up to 30 digits	Specifies the call forwarding DN for CFD option (prompt appears after CFDCNTL)
CFRAPIN	2- to 4-digit PIN	The initial PIN assigned to the line by the operating company (datafill for CFRA)

ISDN Redirection Services (CFW) (continued)

SERVORD prompts for ISDN Redirection Services (CFW) (Sheet 3 of 4)

Prompt	Valid input	Explanation
FIRSTUSE	Y or N	This field indicates if the user needs to change the PIN before the first use of CFRA. This field applies when option SPP is datafill in table CUSTSTN. (Datafill for CFRA)
NOTIFY	Y, N	Provides the switching mechanism for Reminder Notification (prompt appears when CFXTYPE = CFU)
DN_OR_KEYLIST	DN, KEYLIST	Specifies whether you want to enter the required keylist as a list of DNs or a list of key numbers. The keys in this list are assigned the CFW feature specified in prompt CFXTYPE.
CFXDNCT_DNS	10-digit DN	Prompted for if DN was input at previous prompt. A DN is prompted for continuously until a $ is entered to indicate a complete list. Only the DN keys that match the CALLTYPE specified earlier are provisioned with CFW. ***Note:*** Specify a keylist of all VI or CMD keys by entering VI or CMD as the CALLTYPE and $ at the first DN or KEY prompt.
KEY	1-64	Prompted for if KEYLIST was input at previous prompt. A key is prompted for continuously until a $ is entered to indicate a complete list. The specified keys must be the CRBL master key of each DN appearance. ***Note:*** Specify a keylist of all VI or CMD keys by entering VI or CMD as the CALLTYPE and $ at the first DN or KEY prompt.
TERMOPT	ANSRQC, ANSRQNC, NANSR, NECC	Specifies the termination option value assigned to a call type.

SERVORD prompts for ISDN Redirection Services (CFW) (Sheet 4 of 4)

Prompt	Valid input	Explanation
		ANSRQC specifies that a courtesy call is made to a remote DN when the user programs CFW from a set with option CFXVAL. Also specifies that the courtesy call requires an answer and a confirmation indicator. ANSRQNC specifies that a courtesy call is made to a remote DN when the user programs CFW from a set with option CFXVAL. Also specifies that the courtesy call requires an answer but not a confirmation indicator. NANSR specifies that a courtesy call is made to a remote DN when the user programs CFW from a set with option CFXVAL. Also specifies that an answer to the courtesy call and a confirmation indicator are not required. NECC specifies that not courtesy call is established when a user programs a set with option CFXVAL. *Note:* Routing is validated in all cases.

SERVORD example for using option CFXDNCT to add CFU

The following SERVORD example shows how option CFXDNCT is used to add CFW subfeature CFU to an LTID using the ADO command.

The following example SERVORD transaction shows selection of all VI CT appearances for DNs 1 and 2. This method requires option CFXDNCT to be used each time subsequent additions are made, which is shown through the subsequent example of CFB. Since CFB and CFD can exist on an FA key (with CFU) or a DN appearance, they can be provisioned in the same manner as CFU (by the NEW and ADO commands).

ISDN Redirection Services (CFW) (continued)

SERVORD example for using option CFXDNCT to add CFU in prompt mode

```
>ADO
SONUMBER:  NOW 96 10 22 PM
>$
DN_OR_LEN:
>ISDN 2
OPTKEY:
>14
OPTION:
>CFXDNCT
CALLTYPE:
>VI
CFXTYPE:
>CFU
OVRDACR:
>N
NOTIFY:
>Y
DN_OR_KEYLIST:
>DN
CFXDNCT_DNS:
>9055551001
CFXDNCT_DNS:
>9055551002
CFXDNCT_DNS:
>9055551003
CFXDNCT_DNS:
>$
OPTKEY:
>$
```

SERVORD example for using option CFXDNCT to add CFU in no-prompt mode

```
>ADO $ ISDN 2 14 CFXDNCT VI CFU N Y DN 9055551001 9055551002
9055551003 $ $
```

SERVORD example for using option CFXDNCT to add CFB

The following SERVORD example shows how option CFXDNCT is used to add CFW subfeature CFB to an LTID using the ADO command.

SERVORD example for using option CFXDNCT to add CFB in prompt mode

```
>ADO
SONUMBER:  NOW 96 10 22 PM
>$
DN_OR_LEN:
>7501000
OPTKEY:
>14
OPTION:
>CFXDNCT
CALLTYPE:
>VI
CFXTYPE:
>CFB
CFBCNTL:
>P
DN_OR_KEYLIST:
>DN
CFXDNCT_DNS:
>9055551001
CFXDNCT_DNS:
>9055551002
CFXDNCT_DNS:
>9055551003
CFXDNCT_DNS:
>$
OPTKEY:
>$
```

SERVORD example for using option CFXDNCT to add CFB in no-prompt mode

```
>  ADO $ ISDN 2 14 CFXDNCT VI CFB P DN 9055551001 9055551002
9055551003 $ $
```

SERVORD example for adding option CFXVAL

The following SERVORD example shows how option CFXVAL is added to an LTID using the ADO command.

ISDN Redirection Services (CFW) (end)

SERVORD example for adding option CFXVAL in prompt mode

```
>ADO
SONUMBER:  NOW 96 10 22 PM
>$
DN_OR_LEN:
>7501000
OPTKEY:
>1
OPTION:
>CFXVAL
TERMOPT:
>Y
OPTKEY:
>$
```

SERVORD example for adding option CFXVAL in no-prompt mode

```
>ADO $ ISDN2 1 CFXVAL Y $
```

ISDN Support for Associated Group for LTIDs

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

All the datafill information for this particular functionality is included in this document. However, prerequisite software or hardware may be required for complete implementation.

Description

ISDN Support for Associated Group for LTIDs introduces the concept of associated groups. An associated group (AG) allows a directory number/call type (DN/CT) or a group of DN/CTs to be restricted to the use of a single B-channel at a time. Each AG is uniquely identified by means of an Associated Group Assignment (Associated Groups). The AG capability is defined by Bellcore in TR-TSY-268 (ISDN Access Call Control Switching and Signaling Requirements).

Logical terminal identifiers (LTID) are unique labels assigned to a logical terminal when it is datafilled in the ISDN access termination. ISDN Support for Associated Group for LTIDs supports the following LTID interface configurations:

- 2B LTID (introduced in NA007)a single 2B LTID on an interface with access to one B-channel
- NI-2 LTID (introduced in NA008)one or two 2B or 2BD LTIDs on an interface with a National ISDN-2 (NI-2) capabilities. NI-2 capabilities allow the LTIDs to access both B-channels or both B-channels and the D-channel (X.25 packet service).

Note: ISDN Support for Associated Group for LTIDs affects circuit switched B-channels only. The operation of this feature on an NI-2 2B LTID is identical to the operation on an NI-2 2BD LTID. Any reference to an NI-2 LTID in this document applies both to an NI-2 2B LTID and to an NI-2 2BD LTID.

ISDN Support for Associated Group for LTIDs provides the ability to place all the DN/CTs assigned to a 2B LTID or to an NI-2 LTID in an AG. It also

ISDN Support for Associated Group for LTIDs (continued)

provides the ability to place all the voice DNs or circuit mode data (CMD) DNs, or both, of a 2B LTID or an NI-2 LTID in an AG.

Operation

ISDN Support for Associated Group for LTIDs restricts access to B-channels on a call type basis. This restriction is required by certain ISDN customer premises equipment (CPE) that accesses both B-channels, but is incapable of handling two simultaneous voice calls. With the ACOU (additional call offering unrestricted) option, an end user can then be notified that a voice call for the DN was present at the switch, even though a B-channel was unavailable for the call.

Supported associated group con gurations

The associated group capability supports the following interface configurations.

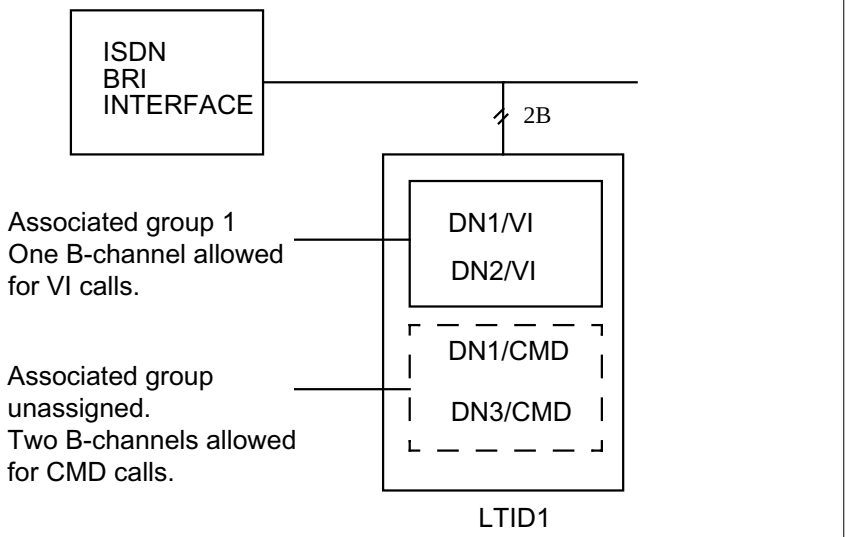
Note: In the following figures, the dotted lines identify a DN/CT that is not part of an AG.

Single 2B LTID or single NI-2 LTID con gurations

The following figure shows the DNs associated with voiceband information (VI) call type in one AG. The DNs that are associated with circuit-mode data (CMD) call types are not part of any AG. This configuration limits the number of active VI call types on the interface to one and the number of active CMD call types to two.

ISDN Support for Associated Group for LTIDs (continued)

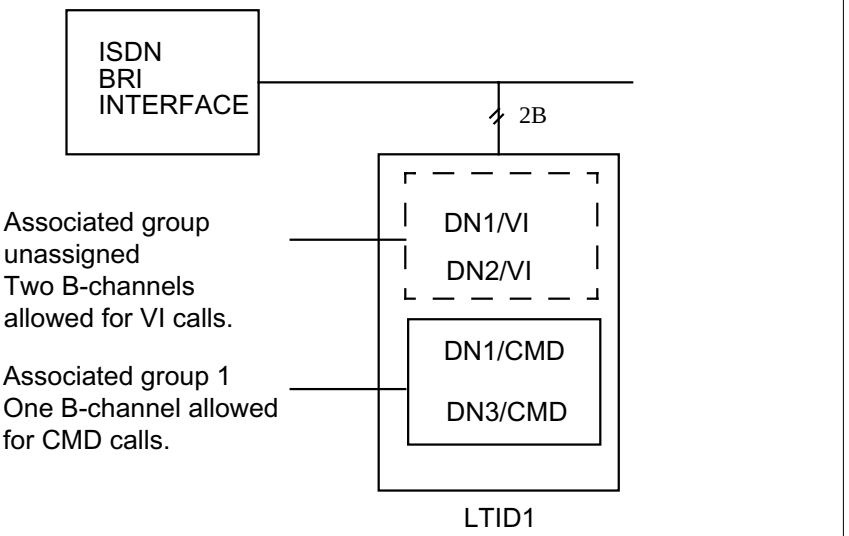
Single 2B LTID or single NI-2 LTID con guration



Note: LTID 1 can be a 2B (NA007) LTID or an NI-2 (NA008) LTID.

The following figure shows the DNs associated with CMD call type placed in one AG. The DNs that are associated with VI call type are not part of an AG.

Single 2B LTID or single NI-2 LTID con guration

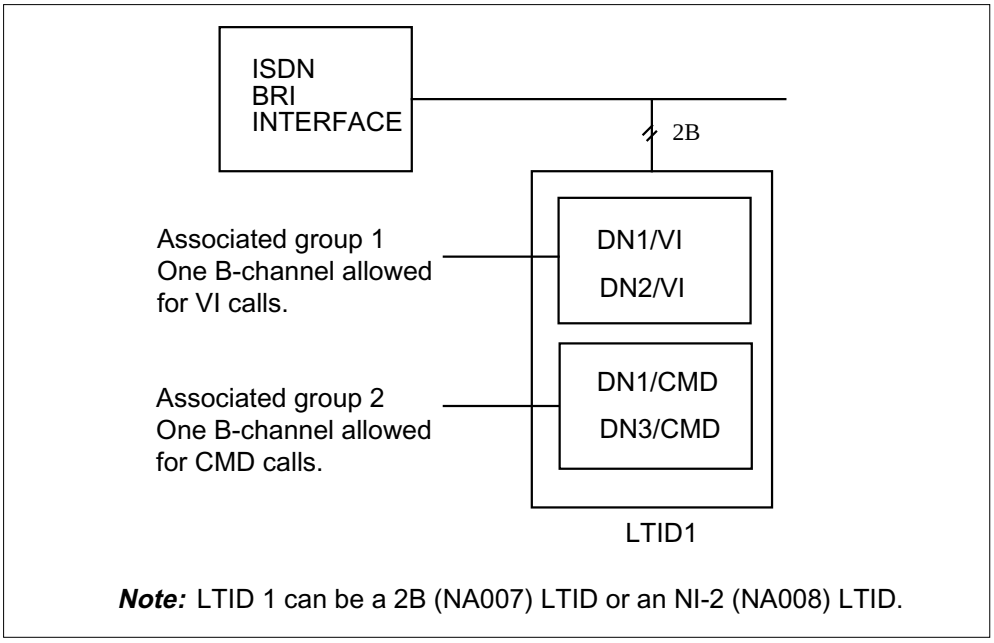


Note: LTID 1 can be a 2B (NA007) LTID or an NI-2 (NA008) LTID.

ISDN Support for Associated Group for LTIDs (continued)

The following figure shows the DNs associated with VI call type in one AG and the DNs associated with CMD call type in a second AG.

Single 2B LTID or single NI-2 LTID con guration

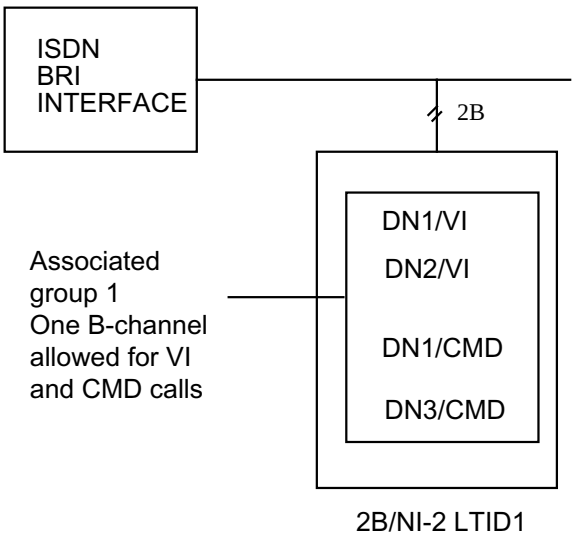


Note: LTID 1 can be a 2B (NA007) LTID or an NI-2 (NA008) LTID.

The following figure shows all DN/CTs associated with the LTID in one AG. This configuration limits the number of active calls on the LTID to one.

ISDN Support for Associated Group for LTIDs (continued)

Single 2B LTID or single NI-2 LTID con guration



Note: LTID 1 can be a 2B (NA007) LTID or an NI-2 (NA008) LTID.

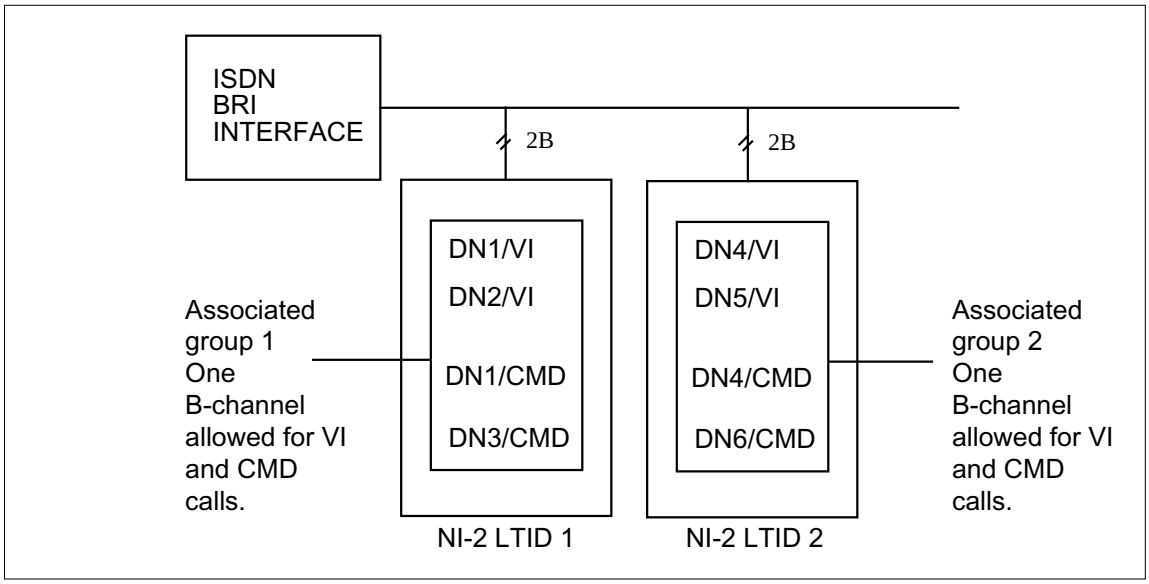
Double NI-2 LTID con gurations

The following configuration figures show AGs assigned on an LTID basis and AG information linked to the LTID.

TH e following figure shows that all DN/CTs associated with LTID 1 are assigned to AG 1 and all DN/CTs associated with LTID 2 are assigned to AG 2.

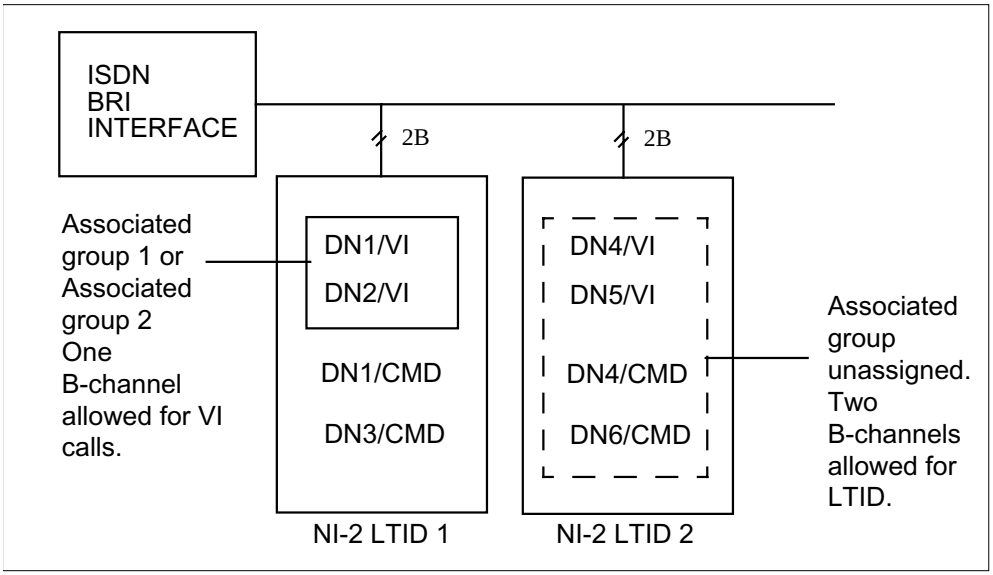
ISDN Support for Associated Group for LTIDs (continued)

Double NI-2 LTID con guration



The following figure shows that all DN/CTs associated with LTID 1, VI call type are in one AG. LTID 2 does not have an AG.

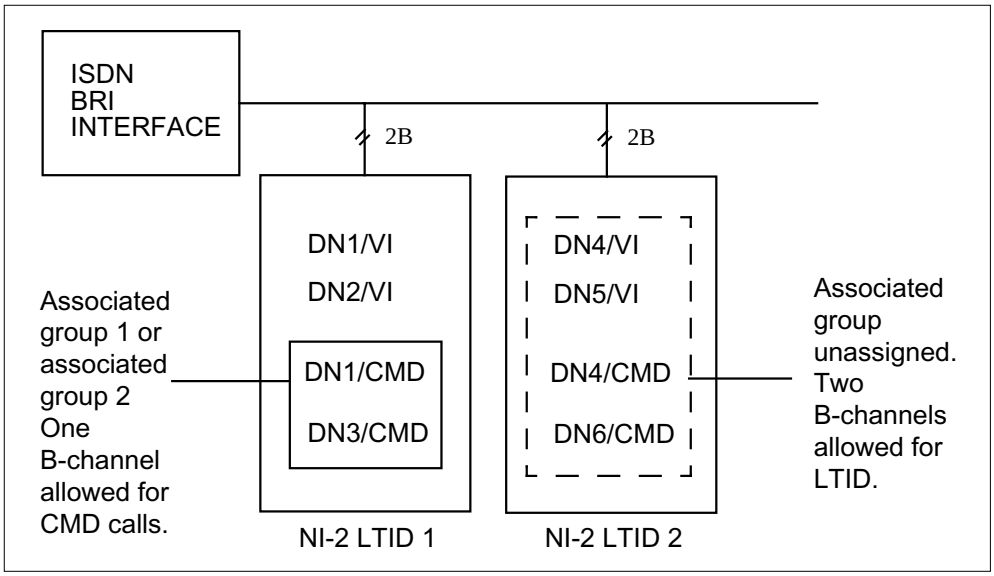
Double NI-2 LTID con guration



The following figure shows that all DN/CTs associated with LTID 1, CMD call type are in one AG. LTID 2 does not have an AG.

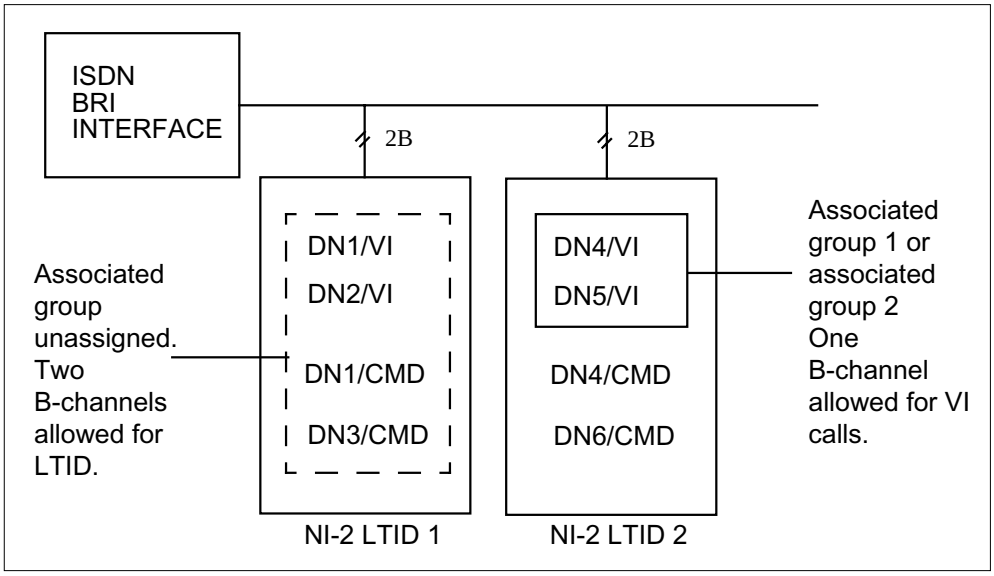
ISDN Support for Associated Group for LTIDs (continued)

Double NI-2 LTID con guration



The following figure shows that LTID 1 does not have an AG. All DN/CTs associated with LTID 2, VI call type are in one AG.

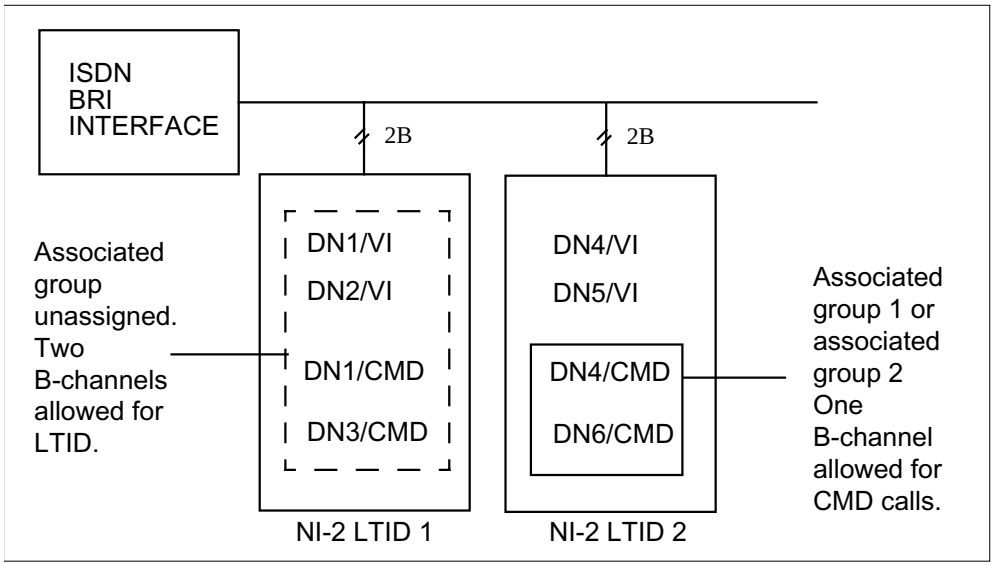
Double NI-2 LTID con guration



The following f igure shows that LTID 1 does not have an AG. All DN/CTs associated with LTID 2, CMD call type are in one AG.

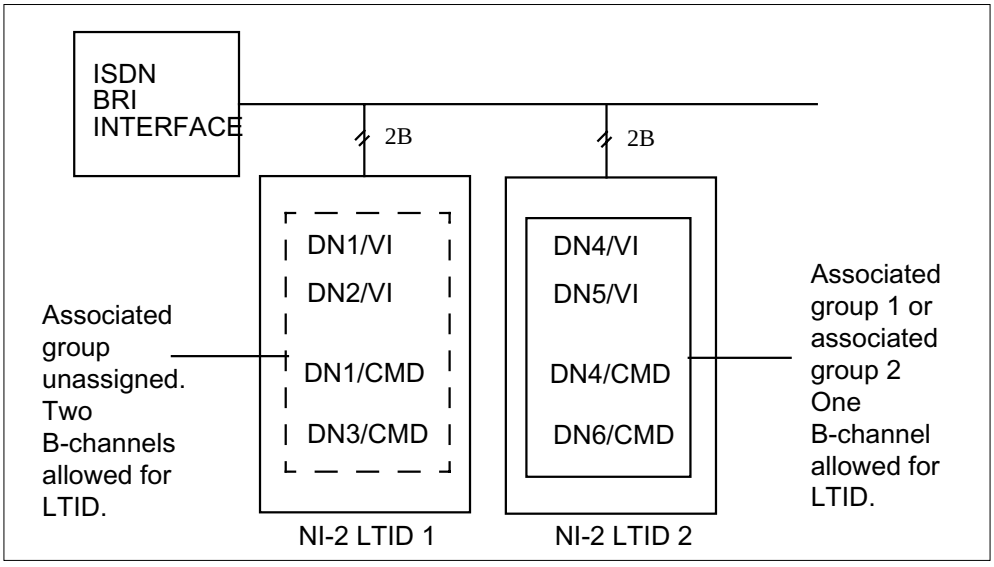
ISDN Support for Associated Group for LTIDs (continued)

Double NI-2 LTID con guration



The following figure shows that LTID 1 does not have an AG. All DN/CTs associated with LTID 2, VI and CMD call types are in one AG.

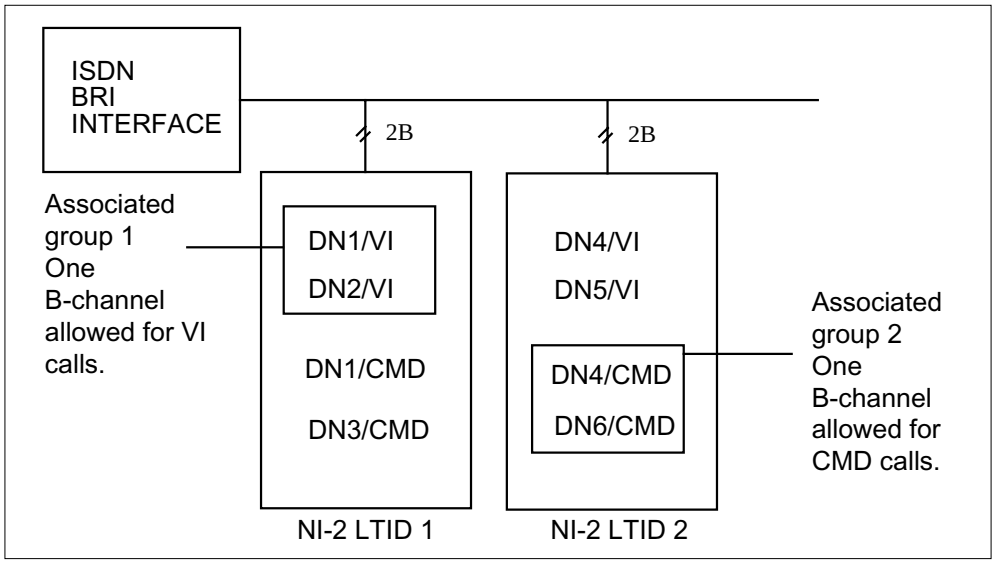
Double NI-2 LTID con guration



The folwong figure shows that all DN/CTs associated with LTID 1, VI call type are in AG 1. All DN/CTs associated with LTID 2, CMD call type are in AG 2.

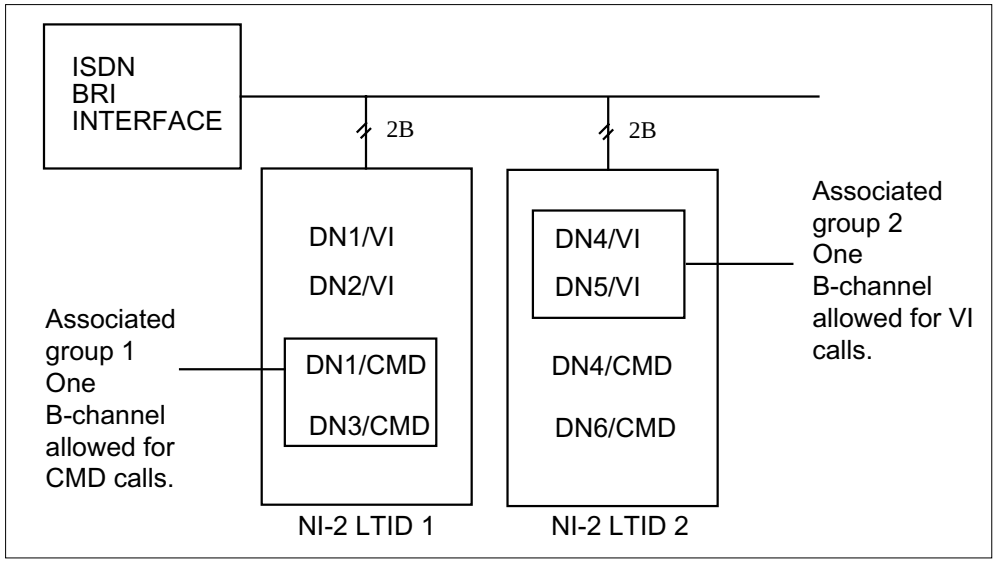
ISDN Support for Associated Group for LTIDs (continued)

Double NI-2 LTID con guration



The follwoing figure shows that all DN/CTs associated with LTID 1, CMD call type are in AG 1. All DN/CTs associated with LTID 2, VI call type are in AG 2.

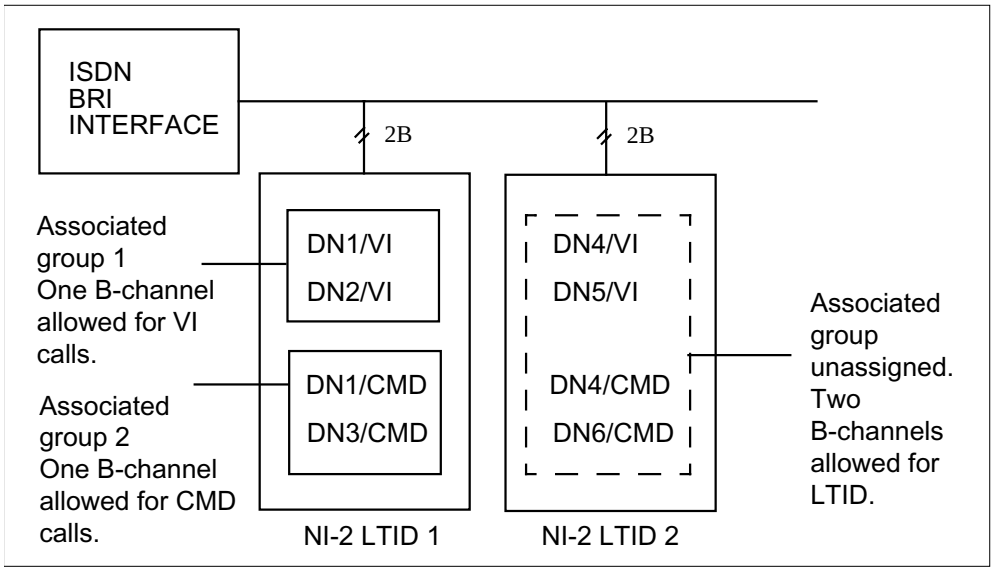
Double NI-2 LTID con guration



The following figure shows that all DN/CTs associated with LTID 1, VI call type are in AG 1 and that all DN/CTs associated with LTID 1 CMD call type are in AG 2. LTID 2 does not have an AG.

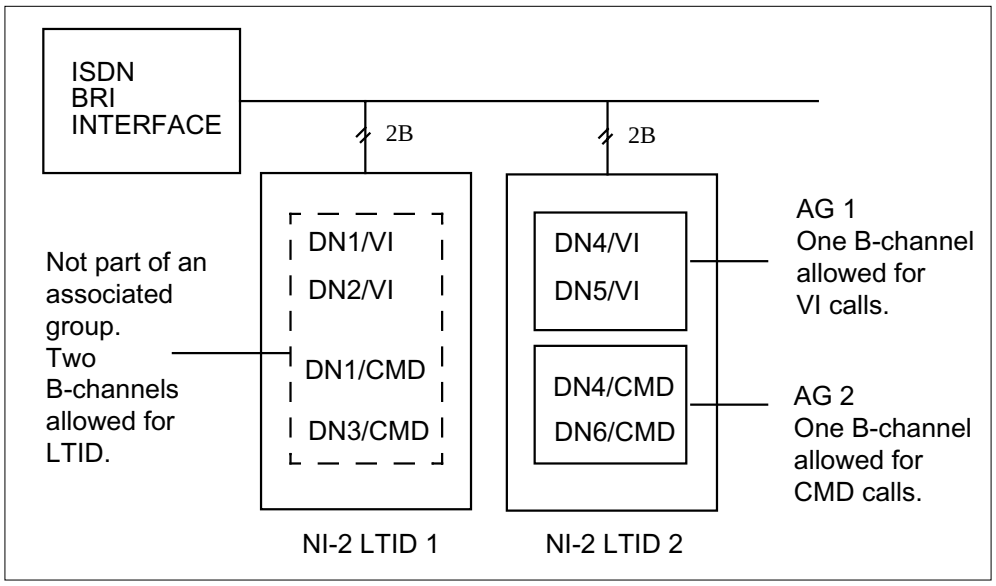
ISDN Support for Associated Group for LTIDs (continued)

Double NI-2 LTID con guration



The following f igure shows that LTID 1 does not have an AG. All DN/CTs associated with LTID 2, VI call type are in AG 1 and all DN/CTs associated with LTID 2, CMD call type are in AG 2.

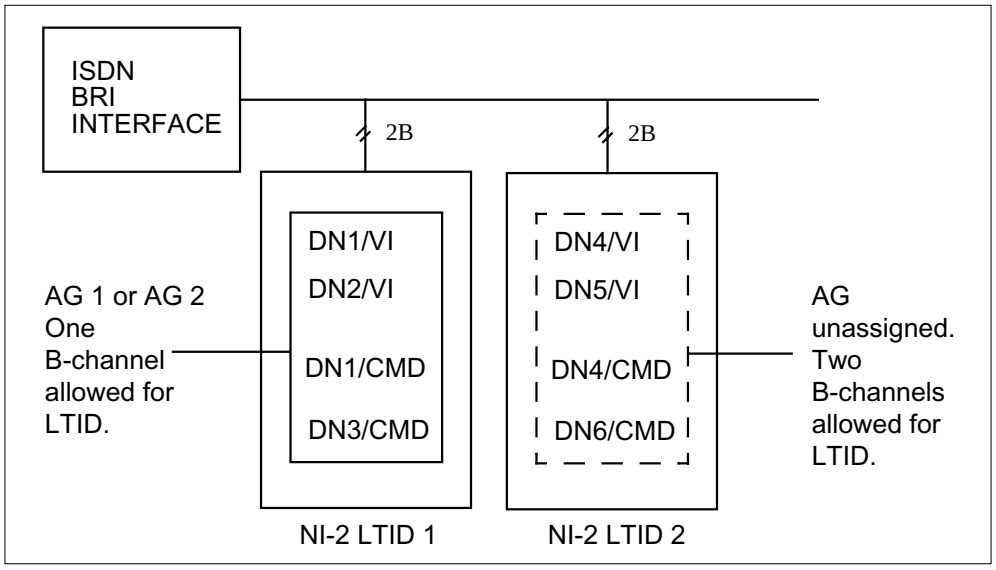
Double NI-2 LTID con guration



The follwoing f igure shows that all DN/CTs associated with LTID 1, VI and CMD call types are in one AG. LTID 2 does not have an AG.

ISDN Support for Associated Group for LTIDs (continued)

Double NI-2 LTID con guration



Rules for Associated Group Assignment

The following table identifies the rules for AGA with ISDN Support for Associated Group for LTIDs.

The AGA rules are based on the following:

- The AG group number has to be unique across an interface.
- The AG call type has to be different for both AG numbers on the same LTID. For example, AG 1 with CMD call type and AG 2 with CMD call

ISDN Support for Associated Group for LTIDs (continued)

type cannot be assigned to the same LTID. This AG assignment is redundant and returns an error message.

- Associated groups are supported on an LTID basis.

Associated Group Assignment rules (Sheet 1 of 4)

Qty. of LTID	Type of LTID	Associated Group Assignment			Configuration description
		VI	***CMD***	***ALL***	
1	2B or NI-2	Assigned	Not Assigned	Not Allowed	Interface has a single 2B or NI-2 LTID. DNs associated with the VI call type are in one associated group. Refer to the following figures.
1	2B or NI-2	Not Assigned	Assigned	Not Allowed	Interface has a single 2B or NI-2 LTID. DNs associated with CMD call type are in one associated group. Refer tothe following figures.
1	2B or NI-2	Assigned	Assigned	Not Allowed	Interface has a single 2B or NI-2 LTID. DNs associated with VI call type are in one associated group, and the DNs associated with the CMD call type are in a second associated group. Refer tothe follwoing figures.
1	2B or NI-2	Not Allowed	Not Allowed	Assigned	Interface has a single 2B or NI-2 LTID. All DN/CTs assigned to the LTID are in one associated group. Refer to the following figures.
1	2B or NI-2	Not Assigned	Not Assigned	Not Assigned	Interface has a single 2B or NI-2 LTID. The LTID does not use the Associated Group capability.
2	NI-2	LTID 1 Not Assigned LTID 2 Not Assigned	LTID 1 Not Assigned LTID 2 Not Assigned	LTID 1 Not Assigned LTID 2 Not Assigned	Interface has two NI-2 LTIDs. The LTIDs do not use the Associated Group capability.

ISDN Support for Associated Group for LTIDs (continued)

Associated Group Assignment rules (Sheet 2 of 4)

Qty. of LTID	Type of LTID	Associated Group Assignment			Configuration description
		VI	***CMD***	***ALL***	
2	NI-2	LTID 1 Not Allowed LTID 2 Not Allowed	LTID 1 Not Allowed LTID 2 Not Allowed	LTID 1 Assigned LTID 2 Assigned	Interface has two NI-2 LTIDs. All DN/CTs assigned to LTID 1 are in AG 1, and all DN/CTs assigned to LTID2 are in AG 2. Refer to the follwoing figures.
2	NI-2	LTID 1 Assigned LTID 2 Not Assigned	LTID 1 Not Assigned LTID 2 Not Assigned	LTID 1 Not Allowed LTID 2 Not Assigned	Interface has two NI-2 LTIDs. DNs associated with LTID1, VI call type are in an associated group. LTID 2 does not have an associated group. Refer to the following figures.
2	NI-2	LTID 1 Not Assigned LTID 2 Not Assigned	LTID 1 Assigned LTID 2 Not Assigned	LTID 1 Not Allowed LTID 2 Not Assigned	Interface has two NI-2 LTIDs. DNs associated with LTID 1, CMD call type are in an associated group. LTID 2 does not have an associated group. Refer to the following figures.
2	NI-2	LTID 1 Not Assigned LTID 2 Assigned	LTID 1 Not Assigned LTID 2 Not Assigned	LTID 1 Not Assigned LTID 2 Not Allowed	Interface has two NI-2 LTIDs. LTID 1 does not have an associated group. DNs associated with LTID 2, VI call type are in an associated group. Refer to the following figures.
2	NI-2	LTID 1 Not Assigned LTID 2 Not Assigned	LTID 1 Not Assigned LTID 2 Assigned	LTID 1 Not Assigned LTID 2 Not Allowed.	Interface has two NI-2 LTIDs. LTID 1 does not have an associated group. DNs associated with LTID 2, CMD call type are in an associated group. Refer to the following figures.

ISDN Support for Associated Group for LTIDs (continued)

Associated Group Assignment rules (Sheet 3 of 4)

Qty. of LTID	Type of LTID	Associated Group Assignment			Configuration description
		VI	***CMD***	***ALL***	
2	NI-2	LTID 1 Not Assigned LTID 2 Not Allowed	LTID 1 Not Assigned LTID 2 Not Allowed	LTID 1 Not Assigned LTID 2 Assigned	Interface has two NI-2 LTIDs. LTID 1 does not have an associated group. DNs associated with LTID 2, VI and CMD call types, are in one associated group. Refer to the follwowing figures.
2	NI-2	LTID 1 Assigned LTID 2 Not Assigned	LTID 1 Not Assigned LTID 2 Assigned	LTID 1 Not Allowed LTID 2 Not Allowed	Interface has two NI-2 LTIDs. DNs associated with LTID 1, VI call type are in an associated group. DNs associated with LTID 2, CMD call types are in a second associated group. Refer to the following figures.
2	NI-2	LTID 1 Not Assigned LTID 2 Assigned	LTID 1 Assigned LTID 2 Not Assigned	LTID 1 Not Allowed LTID 2 Not Allowed	Interface has two NI-2 LTIDs. DNs associated with LTID 1, CMD call type are in an associated group. DNs associated with LTID 2, VI call type are in a second associated group. Refer to the following figures.
2	NI-2	LTID 1 Assigned LTID 2 Not Assigned	LTID 1 Assigned LTID 2 Not Assigned	LTID 1 Not Allowed LTID 2 Not Assigned	Interface has two NI-2 LTIDs. DNs associated with LTID 1, VI and CMD call types are in two separate associated groups. LTID 2 does not have an associated group. Refer to the follwoing figures.

ISDN Support for Associated Group for LTIDs (continued)

Associated Group Assignment rules (Sheet 4 of 4)

Qty. of LTID	Type of LTID	Associated Group Assignment			Configuration description
		VI	***CMD***	***ALL***	
2	NI-2	LTID 1 Not Assigned LTID 2 Assigned	LTID 1 Not Assigned LTID 2 Assigned	LTID 1 Not Assigned LTID 2 Not Allowed	Interface has two NI-2 LTIDs. LTID 1 does not have an associated group. DNs associated with LTID 2, VI and CMD call types are in two separate associated groups. Refer to the following figures.
2	NI-2	LTID 1 Not Allowed LTID 2 Not Assigned	LTID 1 Not Allowed LTID 2 Not Assigned	LTID 1 Assigned LTID 2 Not Assigned	Interface has two NI-2 LTIDs. All DN/CTs assigned to LTID 1 are in an associated group. LTID 2 does not have an associated group. Refer to the following figure.

Translations table o wTranslations table o w

The ISDN Support for Associated Group for LTIDs translations table is described as follows:

- Table LTDEF (Logical Terminal Definition) defines logical terminals and their access privileges. Table LTDEF also allows the operating company to have different functional protocols in use by different ISDN terminals. This table is datafilled through SERVORD.

Limitations and restrictions

The following limitations and restrictions apply to ISDN Support for Associated Group for LTIDs:

- By definition, only one B-channel can be used by an AG.
- AGs apply only to circuit-switched voice and data, and not to packet-switched data.

Interactions

ISDN Support for Associated Group for LTIDs has no functionality interactions.

ISDN Support for Associated Group for LTIDs (continued)

Activation/deactivation by the end user

Not applicable

Billing

ISDN Support for Associated Group for LTIDs does not affect billing.

Station Message Detail Recording

ISDN Support for Associated Group for LTIDs does not affect Station Message Detail Recording.

Data lling of ce parameter s

ISDN Support for Associated Group for LTIDs does not affect office parameters.

Data ll sequence

ISDN Support for Associated Group for LTIDs does not affect datafill sequence. Table LTDEF is the only table accessed by ISDN Support for Associated Group for LTIDs. Table LTDEF is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill table LTDEF.

Translation veri cation tools

ISDN Support for Associated Group for LTIDs does not use translation verification tools.

SERVORD

SERVORD is used to assign the AGA option to a terminal. SERVORD datafills table LTDEF, which defines logical terminals and their access privileges. SERVORD is also used to attach the LTID to a line equipment number (LEN).

SERVORD limitations and restrictions

ISDN Support for Associated Group for LTIDs does not allow the same AG group number to be assigned across an interface.

ISDN Support for Associated Group for LTIDs does not allow identical call types to be assigned to the same LTID. For example, AG 1 with CMD call type and AG 2 with CMD call type cannot be assigned to the same LTID. This AG assignment is redundant and returns an error message.

ISDN Support for Associated Group for LTIDs (continued)

SERVORD prompts

The following table shows the SERVORD prompts used to assign the AGA option to an LTID.

SERVORD prompts for ISDN Support for Associated Group for LTIDs with AGA option (Sheet 1 of 2)

Prompt	Valid input	Explanation
AG_CT	AG_VI, AG_CMD, AG_ALL, AG_UNASSIGNED	Associated groups call type. Enter AG_VI for voiceband information call type. Enter AG_CMD for circuit mode data call type. Enter AG_ALL for both call types. Enter AG_UNASSIGNED for an unassigned call type.
AG_GROUP	1-9	Associated group number.Enter 1-9 for the associated group number.
CS	2B, NI2	Circuit-switched service
DEFLTERM	Y, N	Default terminal. Enter Y (yes) for the default non-initializing terminal (NIT) and the default service profile. Enter N (no) for the fully initializing terminal (FIT).
EKTS	N, Y	Electronic key telephone set ***Note:*** Only a functional (BRAFS) set with dynamic TEI can be defined as an EKTS.
FUNCTION	ADD, REM, ATT, DET, CHA	The action required by the service order.
LTCLASS	BRAFS	Class of logical terminal based on the type of message exchanged between the terminal and the ISDN switch. Enter BRAFS for functional signaling.
LTID	1 to 8 alphanumeric characters, followed by a space and a terminal number (1 to 1022)	The logical terminal identifier.

ISDN Support for Associated Group for LTIDs (continued)

SERVORD prompts for ISDN Support for Associated Group for LTIDs with AGA option (Sheet 2 of 2)

Prompt	Valid input	Explanation
MAXKEYS	2 to 64	Maximum number of feature activators (keys) on a logical terminal used for circuit-switched service.
OPTION (in SLT ADD and SLT CHA function)	AGA	Options installed on the terminal.Enter AGA for associated group assignment.
PS	N, D	Packet-switched service. For 2B and NI-2 2B terminals, enter N for no packet service. For NI-2 2BD terminals, enter D for packet service on the D-channel.
TEI_TYPE	DTEI, STEI	The type of TEI assignment. Enter DTEI for dynamic TEI assignment. Enter STEI for static TEI assignment.

SERVORD examples for ISDN Support for Associated Group for LTIDs

The following figures show SERVORD examples for defining or changing the AGA option on an LTID and for attaching the LTID to a LEN interface.

De ning the A GA option, one group, VI call type

The following example shows the SLT ADD command used to define the AGA option for an NI-2 2B LTID. All DNs associated with VI call type are placed in one AG.

Note: The SLT ADD command can also be used to define the AGA option for a 2B LTID or for an NI-2 2BD LTID.

ISDN Support for Associated Group for LTIDs (continued)

Example of the AGA option with SLT ADD command in prompt mode

```
SO:
> SLT
SONUMBER:  NOW 97 07 26 AM
> $
LTID:
> ISDN 1
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> NI2
PS:
> N
MAXKEYS:
> 64
DEFLTERM:
> N
TEI_TYPE:
> DTEI
EKTS:
> N
OPTION:
> AGA
AG_GROUP:
> 1
AG_CT:
> AG_VI
OPTION:
> $
```

Example of the AGA option with SLT ADD command in no-prompt mode

```
>SLT $  ISDN 1 ADD BRAFS NI2 N 64 N DTEI N AGA 1 AG_VI $
```

De ning the A GA option, two groups, two call types

The following example shows the SLT ADD command used to define the AGA option for an NI-2 LTID that has DNs associated with VI call type in one AG and DNs associated with CMD call type in a second AG.

Note: The SLT ADD command can also be used to define the AGA option for a 2B LTID or for an NI-2 2BD LTID.

ISDN Support for Associated Group for LTIDs (continued)

Example of the AGA option with the SLT ADD command in prompt mode

```
SO:
> SLT
SONUMBER:  NOW 97 07 26 AM
>  $
LTID:
> ISDN 1
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> NI2
PS:
> N
MAXKEYS:
> 64
DEFLTERM:
> N
TEI_TYPE:
> DTEI
EKTS:
> N
OPTION:
> AGA
AG_GROUP:
>  1
AG_CT:
> AG_VI
OPTION:
> AGA
AG_GROUP:
> 2
AG_CT:
>  AG_CMD
OPTION:
> $
```

Example of the AGA option with SLT ADD command in no-prompt mode

```
>SLT $  ISDN 1 ADD BRAFS NI2 N 64 N DTEI N AGA 1 AG_VI AGA 2
AG_CMD $
```

ISDN Support for Associated Group for LTIDs (continued)

De ning all DN/CTs assigned to an L TID in one AG

The following example shows the SLT ADD command used to define the AGA option for a 2B LTID with DN/CTs associated with both VI and CMD call types in one AG.

Note: The SLT ADD command can also be used to define the AGA option for an NI-2 2B LTID or for an NI-2 2BD LTID.

Example of the AGA option with the ADD command in prompt mode

```
SO:
> SLT
SONUMBER:  NOW 97 07 26 AM
> $
LTID:
> ISDN 1
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> 2B
PS:
> N
MAXKEYS:
> 64
DEFLTERM:
> N
TEI_TYPE:
> DTEI
EKTS:
> N
OPTION:
> AGA
AG_GROUP:
> 1
AG_CT:
> AG_ALL
OPTION:
> $
```

Example of the AGA option with the SLT ADD command in prompt mode

```
>SLT $ ISDN 1 ADD BRAFS 2B N 64 N DTEI N AGA 1 AG_ALL $
```

ISDN Support for Associated Group for LTIDs (continued)

Changing the AGA eld of an e xisting associated group

The following example shows the SLT CHA command to change the AGA field of an existing AG for LTID ISDN 1. After completion of the CHA command, all the DNs on ISDN 1 LTID associated with VI call type are allowed access to a single B-channel, while the DNs associated with CMD call type have access to both B-channels.

Example of the AGA option with SLT CHA command in prompt mode

```
SO:
>SLT
SONUMBER:  NOW 97 07 26 PM
>$
LTID:
>ISDN 1
FUNCTION:
>CHA
SET_ATTRIBUTE:
>AGA
AG_GROUP:
>1
AG_CT:
>AG_VI
SET_ATTRIBUTE:
>$
```

Example of the AGA option with SLT CHA command in no-prompt mode

```
>SLT $ ISDN 1 CHA AGA 1 AG_VI $
```

Removing the associated group capability

The following example shows the SLT CHA command used to remove the associated group capability from an LTID by changing the AGA call type to AG_UNASSIGNED.

ISDN Support for Associated Group for LTIDs (continued)

Example of the AGA option with SLT CHA command in prompt mode

```
SO:
>SLT
SONUMBER:  NOW 97 07 26 PM
> $
LTID:
>ISDN 1
FUNCTION:
>CHA
SET_ATTRIBUTE:
>AGA
AG_GROUP:
>1
AG_CT:
>AG_UNASSIGNED
SET_ATTRIBUTE:
>$
```

Example of the AGA option with SLT CHA command in no-prompt mode

```
>SLT $ ISDN 1 CHA AGA 1 AG_UNASSIGNED $
```

Attaching existing NI-2 LTIDs to a LEN

The SLT ATT command can be used to attach existing NI-2 LTIDs to a LEN interface. The attachment succeeds when there are no conflicts in AGs. Conflicts in AGs occur when two AGs are assigned the same number. The following example shows the SLT ATT command to assign two NI-2 LTIDs with B-channel restrictions (restricted to one) for VI and CMD call types to a LEN.

Example of attaching existing NI-2 LTIDs with SLT ATT command

```
> SLT $ ISDN 1 ADD BRAFS NI2 N 64 N DTEI N AGA 1 AG_ALL $

> SLT $ ISDN 10 ADD BRAFS NI2 N 64 N DTEI N AGA 2 AG_ALL $

> SLT $ ISDN 1 ATT HOST 01 0 00 04 $

> SLT $ ISDN 10 ATT HOST 01 0 00 04 $
```

ISDN Support for Associated Group for LTIDs (continued)

Resolving AGA option errors

An explanation of AGA option errors and the resolution of such errors is described as follows:

1. AG is defined for two NI-2 LTIDs identified as ISDN 1000 and ISDN 100. All DNs associated with VI call type are placed in AGA 1 and all DNs associated with CMD call type are placed in another associated group identified as AGA 1.
2. An attempt is made to attach ISDN 1000 and ISDN 100 to a LEN interface.
3. An error message displays indicating a conflict in AG numbers.
4. An attempt is made to change ISDN 1000 AGA 1 AG_VI to ISDN 1000 AGA 2 AG_VI.
5. An error message displays indicating a conflict in AG call types.
6. The AGA assignment is removed from ISDN 1000 AGA 1 AG_VI by changing ISDN 1000 to AGA 1 AG_UNASSIGNED.
7. ISDN 1000 AGA 1 AG_VI is successfully changed to ISDN 1000 AG 2 AG_VI.
8. ISDN 1000 and ISDN 100 are successfully attached to a LEN interface.

The following figure illustrates an example of resolving AGA option errors.

ISDN Support for Associated Group for LTIDs (end)

Example of resolving AGA option errors

```
>SLT $ ISDN 1000 ADD BRAFS NI2 N 64 N DTEI AGA 1 AG_VI $

>SLT $ ISDN 100 ADD BRAFS NI2 N 64 N DTEI AG A 1 AG_CMD $


>SLT $ ISDN 1000 ATT HOST 01 0 00 05 $ Y

>SLT $ ISDN 100 ATT HOST 01 0 00 05 $ Y

AG already exists for Group 1
Cannot add the tuple to table LTMAP


>SLT $ ISDN 1000 CHA AGA 2 AG_VI $

Redundancy Error:  AG_GROUP 1 AG_CT is
equal to AG_GROUP 2 AG_CT
Unable to update table LTDEF


>SLT $ ISDN 1000 CHA AGA 1 AG_UNASSIGNED$

>SLT $ ISDN 1000 CHA AGA 2 AG_VI $


>SLT $ ISDN 1000 ATT HOST 01 0 00 05 $ Y

>SLT $ ISDN 100 ATT HOST 01 0 00 05 $ Y
```

ISDN TCAP Calling Name Delivery

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

To operate, ISDN TCAP Calling Name Delivery has the following prerequisites:

- BAS Generic, BAS00003
- MDC Minimum, MDC00001
- MDC Standard, MDC00003
- RES Service Enablers, RES00006

Description

The ISDN transaction capabilities application part (TCAP) Calling Name Delivery (CNAMD) feature extends existing DMS-100 TCAP CNAMD to include ISDN basic rate interface (BRI) subscribers. This feature is also referred to as ISDN basic rate interface (BRI) TCAP Calling Name Delivery (I-CNAM).

This feature displays the name associated with a calling party to a terminating ISDN TCAP CNAMD subscriber. The displaying of this name depends on the permanent privacy status associated with the name. Names are stored in a centralized database located at a Service Control Point (SCP). These names are based upon the North American numbering plan 10-digit directory number (DN). The centralized database is accessed for both intra-switch and inter-switch calls. The terminating switch uses the TCAP layer of the Signaling System 7 (SS7) protocol to retrieve the name information. This name information is delivered to the ISDN TCAP CNAMD subscriber's customer premises equipment (CPE).

Operation

ISDN TCAP CNAMD is activated directly from the terminator's end office on the basis of a flat-rate or subscription usage sensitive pricing (SUSP). The operating company enters the datafill for this feature through SERVORD and assigns CNAMD to an ISDN BRI DN key. You can assign this feature for an entire office, for a customer group, or for a line.

ISDN TCAP Calling Name Delivery (continued)

Of ce option CNAMD

This feature creates office option CNAMD to allow this feature to apply to all lines in the office. Table RESOFC controls feature availability for an entire office. The default tuple for the CNAMD tuple is disabled (field ENABLED set to N) and subscription access only (subfield ACCESS in field FEATDATA is set to SUBSCR).

Customer group options

Option CLID

Table CUSTNTWK stores the features that are assignable to a customer group. Two customer group controls exist for ISDN CNAMD: CLID and TCAPNM. Subfield CLIDOPT of option CLID in table CUSTNTWK controls the availability of the DN or name to be delivered, based on the type of network.

This subfield can be set to the following three network types:

- ONNET (on-network calls) for calls originating on the same network as the called party
- OFFNET (off-network calls) for all network calls regardless of origin
- INTRAGRP for intragroup calls

Option TCAPNM

Option TCAPNM in table CUSTNTWK provides customer group control. The operating company can use either the local name database or the centralized name database for RES, IBN, and PSET subscribers.

With option TCAPNM set to ON for an ISDN BRI customer group and with other required datafill completed, calling names are retrieved from the TCAP centralized name database. With option TCAPNM set to OFF, calling names are retrieved from the local proprietary DMS-100 database.

Specify office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG This choice is available when both CND and CNAMD are assigned on a SUSP basis and both features are active. The values for the parameter are Y (yes) and N (no).

Line option

SUSP

When CNAMD SUSP is added to the ISDN BRI subscriber, the initial status of CNAMD is inactive unless Calling Number Delivery (CND) is also active the ISDN BRI DN. To activate CNAMD SUSP, an activation code is required. Table IBNXLA defines the access codes used to activate and deactivate the CNAMD SUSP feature for RES, IBN, and ISDN CNAMD subscribers.

ISDN TCAP Calling Name Delivery (continued)

The key to table IBNXLA consists of the translator name and access code.

To enter a Calling Number Activation (CNDA) or Calling Number Delivery Deactivation (CNDD) code, set subfield FEATURE in field RESULT to CNDA or CNDD. To enter a CNDA or CNDD code, set subfield XLANAME in the KEY field to the appropriate access code value.

Flat rate

When CNAMD is added for an ISDN BRI subscriber without SUSP, activation of CNAMD is automatically established.

Out-of-area indication

Both unavailable and private names deliver an out-of-area indication to the ISDN TCAP CNAMD subscriber's CPE. The actual text message sent to the CPE is controlled by entering the datafill of the EXTERNALMSG reason identifier in table REASONS.

Translations table o w

The ISDN TCAP Calling Name Delivery translations tables are described in the following list:

- Table OFCENG contains office parameters to enable and disable office-wide features. Specify office parameter ISDNBRI_CNAMD_CND_ONE_AMA to generate one or two AMA records. When set to Y, one AMA record is generated. The default value is N, which generates two AMA records.
- Table RESOFC controls feature availability for an entire office. Datafill the ENABLED field of the CNAMD tuple with Y to activate CNAMD for the office (RES, IBN, and ISDN BRI subscribers).
- Table CUSTNTWK stores the features that are assignable to a customer group. Access this table by the ISDN customer group name tuple, and datafill it with option CLID for CNAMD functionality. Enter a value of ONNET, OFFNET, or INTRAGRP in subfield CLIDOPT of to control the availability of the DN or name to be delivered, based on the type of network. Set option TCAPNM to ON or OFF to allow use of the TCAP database for calling name delivery.
- Table AMAOPTS controls the activation and scheduling of the recording options for AMA billing. Set field SUSP to Y for subscription usage-sensitive pricing, if applicable.
- Table RESFEAT contains the assignment of CLASS features for residential lines. This table is automatically updated for each DN assigned

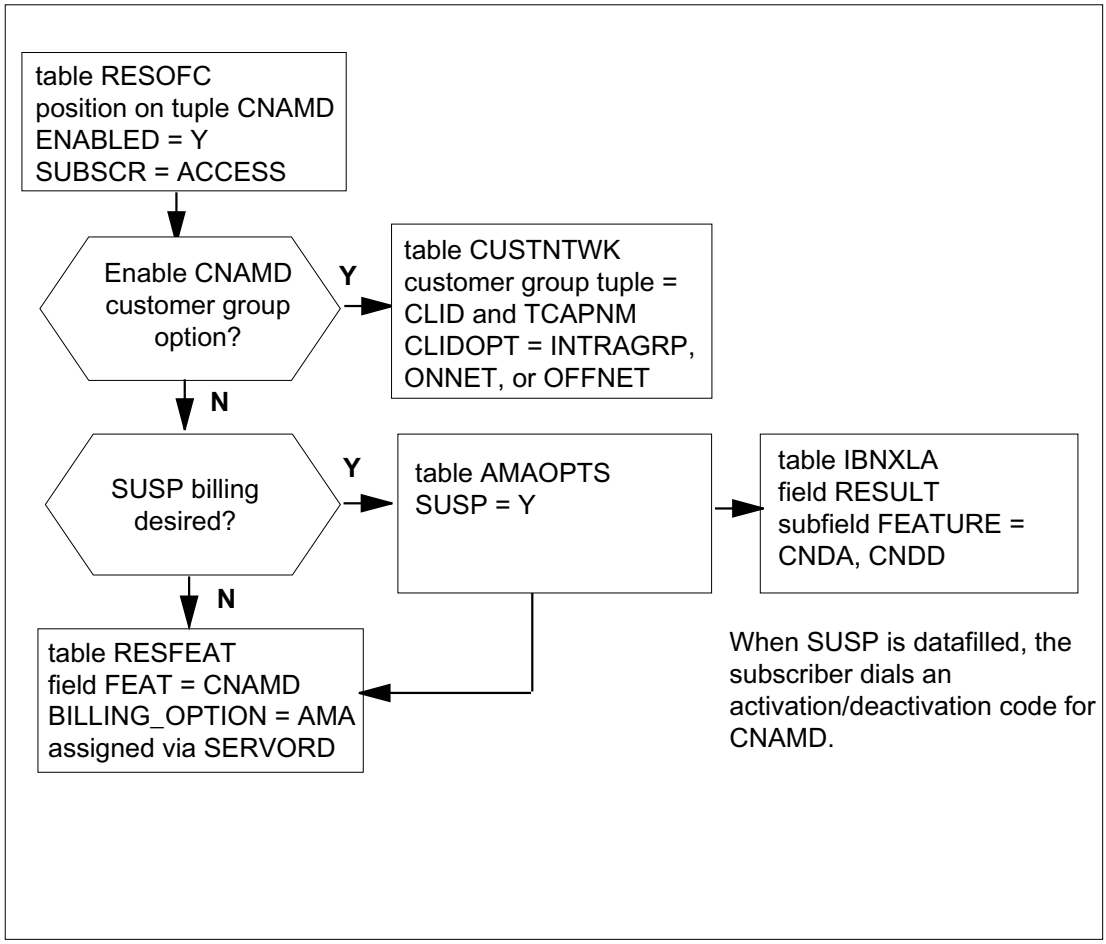
ISDN TCAP Calling Name Delivery (continued)

CNAMD by SERVORD. Field FEAT equals CNAMD, and field BILLING_OPTION equals AMA, if applicable.

- Table IBNXLA stores the access codes used to activate and deactivate display features such as CNAMD SUSP for RES, IBN, and ISDN subscribers. Assign feature translators and access codes for CNDA and CNDD. Access this table by the translator name and access code for the feature's activation or deactivation.

The flowchart that follows provides the ISDN TCAP Calling Name Delivery translations process.

Table o w for ISDN TCAP Calling Name Delivery



ISDN TCAP Calling Name Delivery (continued)

The following table lists the datafill content used in the flowchart.

Data ll e xample for ISDN TCAP Calling Name Delivery

Datafill table	Example data
RESOFC	CNAMD N SUBSCR CNAMD
CUSTNTWK	ISDNGRP PUBLIC 1 $ (CLID OFFNET) (TCAPNM)
IBNXLA	CXT1 65 FEAT N N N CNDA CXT1 85 FEAT N N N CNDD

Limitations and restrictions

The following limitations and restrictions apply to ISDN TCAP Calling Name Delivery:

- The ISDN display features are supported only on National ISDN Protocol Version Control (PVC) Functional Issue 2 terminals.
- The CNAMD option must also be assigned to the terminating party DN, and the TCAPNM option must be assigned to the customer group.
- End-to-end ISUP CCS7 connectivity is required on inter-switch calls to transmit the calling DN to the terminating switch. When the appropriate information cannot be transmitted due to a lack of CCS7 connectivity, no name indication is transmitted to the ISDN TCAP CNAMD user.
- ISDN TCAP CNAMD uses the same centralized name database that is used by the RES and MDC TCAP CNAMD features. Therefore, all necessary datafill for providing the RES TCAP CNAMD functionality is required.
- For ISUP trunk to ISDN BRI calls, an out-of-area indication is sent to the ISDN BRI CPE in the event that a calling party number is received in the ISUP IAM with other than a 10-digit DN. The centralized name database requires a 10-digit DN in the TCAP query.
- ISDN TCAP CNAMD is not supported for primary rate interface (PRI) trunk-originated calls that terminate to an ISDN BRI subscriber. When the originating trunk type is PRI, an out-of-area indication is delivered.
- ISDN TCAP CNAMD SUSP activation and deactivation is provided by existing RES or IBN Calling Number Delivery Activation (CNDA) and Calling Number Delivery Deactivation (CNDD) codes, respectively. Feature key activation and deactivation is not provided.
- Delivery of TCAP calling name information is not supported during Automatic Call Back (ACB) or Automatic Recall (AR) ringback.

- This feature is not supported to terminating electronic key telephone service (EKTS) Multiple Appearance Directory Number (MADN) groups. It is incompatible with MADN SCA (Single Call Arrangement) and MADN CACH (Call Appearance Call Handling).
- The basic business group (BBG) and multi-switch business group (MBG) procedures are not supported.
- Existing ISDN BRI display text functionality (provided by proprietary name and reason display) is unchanged by this feature.
- Redirecting Name Delivery is not supported. The existing proprietary (non-TCAP) redirecting name delivery remains in effect.
- The existing CLASS CNAMD and Calling Number Delivery (CND) operational measurements (OM) are used.
- ISDN CNAMD can only be added to a DN key. Therefore, the ISDN CNAMD SUSP option can only be activated/deactivated by an access code. Key activation/deactivation is not allowed.
- ISDN CNAMD cannot be added to a Bridged Night Number (BNN) member.
- ISDN CNAMD with AMA option cannot be assigned to lines with DOR (Denied Origination) or AUL (Automatic Line).
- ISDN CNAMD cannot be added through a feature group.
- The line option CNAMD can be assigned without any of the TCAPNM customer group options or TCAP office parameters, but the TCAP calling name will not be delivered.
- The initial state of ISDN CNAMD TCAP with SUSP is inactive, unless CND is already active on the set. To change the state to active, the user can activate ISDN CNAMD TCAP by activation code CNDA.

Interactions

The following paragraphs describe the interactions between ISDN TCAP Calling Name Delivery and other functionalities.

Additional Call Offering (ACOU), Additional Functional Calls (AFC)

These features together allow an ISDN set to accept more than one call on a particular directory number. Calls can be controlled by means of extra DN keys, but only one call may be active at a particular time. Calls terminating to an ISDN AFC key receive the TCAP calling name. NI-2 calls that are offered using ACOU (offered without a B-channel) receive the TCAP calling name.

ISDN TCAP Calling Name Delivery (continued)

ADDRESS DNGRPS option

The DNGRPS option allows a calling DN to be mapped to another DN to be used as the originating address. If the originating DN is changed by this feature, then the TCAP name query is launched using this changed DN.

Advanced Intelligent Network (AIN 0.1)

Instead of the originating party DN, the Calling Party Number (CPN) parameter in the Analyze_Route, Forward_Call, or Authorize_Termination message returned from the AIN 0.1 SCP response is used to query the centralized name database. This allows the name associated with the CPN provided by the AIN 0.1 SCP to be displayed on the CPE of the terminating ISDN subscriber.

When no CPN is provided in the AIN 0.1 response, the original calling party DN is used for querying the centralized name database.

The AIN 0.1 Display Text parameter is supported only for RES, 1FR, and 1MR line classes and, therefore, has no impact on ISDN TCAP CNAMD.

Auto Dial

The Auto Dial feature automatically dials a stored number. The TCAP calling name is delivered to an ISDN party when Auto Dial was used to originate the call.

Automatic Line

Automatic Line originates calls to a predefined DN. ISDN TCAP CNAMD supports Automatic Line functionality.

Automatic Call Back (ACB)/Automatic Recall (AR)

The ACB feature allows a subscriber to make a call to the last station called by the subscriber. The AR feature allows a user to call the last station that called the subscriber. In the event the call cannot be completed because of a busy line, the ACB/AR subscriber receives a confirmation tone or announcement. Ringback is given to the ACB/AR subscriber once the called party becomes free. The TCAP calling name information is not delivered during the ringback on ACB/AR activations. However, TCAP calling name information is delivered to the ISDN called party.

Basic Business Group (BBG)

TCAP CNAMD overrides the proprietary name delivery if both features are assigned to the line or group and CNAMD SUSP is activated. If CNAMD SUSP is deactivated, then proprietary name delivery occurs. When CNAMD is assigned to the line on a flat-rate basis, and appropriate TCAP Calling Name

group datafill is in place, TCAP CNAMD takes precedence over proprietary name delivery.

There is no discrimination between intra- or inter-group calls in determining which database is used to obtain the calling name. TCAP Calling Name is used in all cases where it is assigned and activated.

Call Forward Universal (CFU), Call Forward Busy (CFB), Call Forward Fixed (CFF)

If the ISDN CNAMD subscriber has activated the call forward universal, call forward busy, or call forward fixed feature, then no name is transmitted to the call forward base station on call forward since the call is not answered.

If a call is forwarded to an ISDN remote party, then TCAP calling name information associated with the originator is delivered to the ISDN remote station.

For all call forwarding scenarios that forward over ISUP, the TCAP calling name is not sent in the IAM. The terminating office is responsible for querying the centralized database for calling name information based on the 10-digit calling party number in the ISUP IAM.

Note: Redirecting proprietary name information (NAMEDISP), if provisioned, will continue to show the proprietary redirecting name and redirecting reason on the call forwarded remote station.

Call Forwarding Don't Answer (CFD)

With the Call Forwarding Don't Answer feature, TCAP calling name information associated with the originator is delivered to the ISDN call forward base station. When the call is not answered within the specified period of time, the call is forwarded to a remote party. TCAP calling name information associated with the originator is delivered to the call forward remote station.

For scenarios that forward over ISUP, the TCAP calling name is not sent in the IAM. The terminating office is responsible for querying the centralized database for calling name information based on the 10-digit calling party number in the ISUP IAM.

Note: Redirecting proprietary name information (NAMEDISP), if provisioned, will continue to show the proprietary redirecting name and redirecting reason on the call forwarded remote station.

ISDN TCAP Calling Name Delivery (continued)

Call Hold

If TCAP calling name was delivered during the initial termination to the ISDN BRI party, then all subsequent retrievals from call hold display the TCAP calling name.

Calling Number Delivery (CND)

If an ISDN party subscribed to both CND and CNAMD, then both TCAP calling name and calling number are displayed.

Call Park (PRK, DCPK)

ISDN sets do not update name display during Call Park functions. If an ISDN set is the original terminator who parks the call, then the TCAP calling name is delivered at termination time, since it is a basic call function. Call Park Recall does not update the ISDN display with either the proprietary or TCAP calling name. If an ISDN set retrieves a parked call, the TCAP name is not displayed.

Call Pickup (CPU, DCBI)

The Call Pickup feature allows a subscriber to pick up calls in a predefined call pickup group or in a customer group by dialing an access code. The party that performs the pickup does not receive any TCAP calling name information.

Call Transfer

When the ISDN TCAP CNAMD subscriber is the conference call add-on party, a TCAP name query is launched based on the DN of the conference controller. If the conference controller performs a call transfer before the TCAP response is received by the add-on party and before the TCAP name timer expires, then the TCAP response is no longer valid. The proprietary connected name is delivered to the transferred-to MDC or ISDN BRI customer premise equipment upon transfer.

Calling Identity Delivery and Suppression (CIDS)

Using features CNND and CNNB, originators may explicitly deliver or block both their name and number. If an ISDN party is called by a party that has activated CNNB, then the TCAP calling name is not displayed.

Conference features

Conference features interact with ISDN TCAP CNAMD so that when any conference feature initiates a normal two-party call to an ISDN party, the ISDN party receives the TCAP calling name.

If the TCAP response is received by the add-on party after the controller has conferenced, then the response is not considered valid and is not displayed to the add-on party.

- 3WC and Flexible Calling. These two features require the controller to call each of the add-on parties. ISDN BRI add-on parties receive the TCAP calling name of the controller before conference or transfer.
- Station-Controlled. This feature requires the controller to call each of the add-on parties. ISDN add-on parties receive the TCAP calling name of the controller.
- Meet-Me. Parties must call a central conference number. Since no ISDN parties are called, TCAP CNAMD does not apply.
- Preset. When the controller calls the conference number, each of the preset conferees is automatically called. Since this is not a typical two-party call scenario, any ISDN add-ons do not receive the TCAP calling name.

Executive Busy Override (EBO)

The ISDN party who is barged-in on by EBO does not receive any display updates during EBO feature functions. An ISDN terminator who originally displayed the TCAP calling name does not display the EBO party's name upon barge-in, and therefore does not change when the EBO party exits the call.

Group Intercom Calls (GIC)

The GIC feature allows a user to terminate a call on a member of a designated intercom group using abbreviated dialing. For calls terminating to an ISDN BRI group intercom, no TCAP calling name information is delivered.

Hunt Groups (DNH, MLH)

Hunting is a call-completion process that increases the likelihood of an incoming call being completed within a subscriber-defined group of lines. When attempting to terminate a call to a busy line that is assigned hunting, the switch scans a group of lines sequentially, searching for an idle line on which to complete the call. This group of lines is called a hunt group. The TCAP calling name information is sent to a line when it is alerted of an incoming call.

Last Number Redial (LNR)

This feature redials the last number dialed by the subscriber. In a call originated by means of LNR to an ISDN party, the ISDN party receives the TCAP calling name.

Make Set Busy (MSB)

With MSB, the ISDN party appears busy to all incoming calls, and thus no TCAP calling name is displayed.

ISDN TCAP Calling Name Delivery (continued)

Message Waiting (CAR, CRR, MWT)

Message waiting, in conjunction with call request retrieve and call request, enables a party to log a call against another party, enabling that party to dial an access code to call back the requesting party. Calls originated to an ISDN party by means of CRR do not receive the TCAP calling name.

Multiparty lines

When an ISDN party is called by a multiparty line, the TCAP calling name is displayed based on the DN of the proper multiparty line.

Note: 4FR lines need special hardware to discriminate individual DNs or an operator-assisted call. 8FR lines cannot discriminate.

MADN SCA and EKTS CACH

The Electronic Key Telephone Service (EKTS) Call Appearance Call Handling (CACH) and MADN Single Call Arrangement (SCA) features allow a single DN to be associated with a group or groups of subscriber lines. One member of the group can be a residential line and another can be a business line. The TCAP calling name is not provided to any member of the EKTS MADN SCA or EKTS CACH group.

Multiswitch Business Group (MBG) Feature Networking Control

MBG Feature Networking Control implements a per-customer group control mechanism for a subset of the networked features available to calls using a MBG service. The network features that can be controlled are: network name display (NAME) and network number/reason display (CLID).

Control of the CLID and NAME display features for a customer group is accomplished by the addition of option MBGDENY to table CUSTNTWK. Option MBGDENY has two associated sub-options: option CLID and option NAME.

TCAP calling name information is not delivered to the called party for MBG calls over public ISUP trunks when the terminating switch has option MBGDENY NAME or option MBGDENY CLID NAME for the customer group.

Proprietary CNAMD

If datafill and service orders have been completed to allow TCAP CNAMD to an ISDN BRI subscriber on a flat-rate basis and if the customer group of that subscriber is also assigned the proprietary name delivery option NAMEDISP in table CUSTSTN, then TCAP name delivery takes precedence over proprietary name delivery.

ISDN TCAP Calling Name Delivery (continued)

When TCAP CNAMD is assigned on a SUSP basis and the ISDN BRI subscriber has activated Calling Name/Number Delivery, TCAP name delivery takes precedence over proprietary name delivery. However, if TCAP CNAMD is in the inactive state, proprietary name delivery occurs.

Additionally, there is no discrimination between inter-business group and intra-business group calls to determine which CNAMD mechanism to use. The following table shows the name delivered to the ISDN BRI subscriber based on the options assigned.

TCAP versus proprietary CNAMD

#	Line level CNAMD (active)	Customer group NAMEDISP	Customer group TCAPNM	BRI name
1	CNAMD	<no name delivered>	TCAPNM	TCAP name delivered
2	<no name delivered>	NAMEDISP	<no name delivered>	Proprietary name delivered
3	<no name delivered>	NAMEDISP	TCAPNM	Proprietary name delivered (note 1)
4	CNAMD	NAMEDISP	TCAPNM	TCAP name delivered (note 2)
5	CNAMD (inactive)	NAMEDISP	TCAPNM	Proprietary name delivered
6	CNAMD	<no name delivered>	<no name delivered>	None (note 1)
7	<no name delivered>	<no name delivered>	TCAPNM	None
8	<no name delivered>	<no name delivered>	<no name delivered>	None

Note 1: This is a different functionality from MDC or RES.

Note 2: For CNAMD inactive, the proprietary name is delivered.

Ring Again (RAG)

The RAG feature allows the subscriber encountering a busy DN to be notified when the busy party becomes idle and the same DN is redialed automatically.

ISDN TCAP Calling Name Delivery (continued)

Ringing is provided to the RAG subscriber once the busy party is free. The TCAP calling name information is not delivered during the RAG ringback. However, TCAP calling name information is delivered to the RAG called party.

Selective Call Acceptance (SCA)

TCAP calling name information is delivered to the ISDN line if Selective Call Acceptance applies and the call is allowed to terminate. For those calls that are not accepted, termination to the ISDN line does not occur. TCAP calling name information is not delivered.

Selective Call Forwarding (SCF)

For an ISDN line with Selective Call Forwarding (SCF), the interactions are the same as Call Forwarding if SCF applies to the call and the call is forwarded. If SCF does not apply to the call, then the call terminates to the ISDN call forward base station and TCAP calling name information is delivered.

Selective Call Rejection (SCRJ)

TCAP calling name information is delivered to the ISDN line when SCRJ does not apply to the call and the call is allowed to terminate. For those calls that are rejected, termination to the ISDN line does not occur and thus TCAP calling name information is not delivered.

Speed Call

Speed Call enables subscribers to dial an abbreviated access code that corresponds to a pre-programmed DN. Calls to an ISDN party by means of Speed Call receive the TCAP calling name.

SUPPRESS line and DNGRPS option

The SUPPRESS line option sets the originator's permanent privacy status for number and name. During termination to the ISDN TCAP CNAMD subscriber, the permanent privacy status of the name is not used to discriminate when a TCAP query should be launched. The permanent privacy status of the calling number, as set by SUPPRESS, is considered when determining whether ISDN TCAP CNAMD applies.

The SUPPRESS DNGRPS network option affects the delivery of TCAP calling name. If the option is set to SUPPRESS NAME in DNGRPS, then no TCAP name query is launched.

Activation/deactivation by the end user

ISDN BRI subscribers on a SUSP billing plan activate and deactivate CNAMD with an access code established by the operating company.

ISDN TCAP Calling Name Delivery (continued)

Activation/deactivation of ISDN TCAP CNAMD by the end user

At your telephone

1 To activate CNAMD, dial the CNDA activation code.

Response: ISDN TCAP CNAMD is now functional.

2 To deactivate CNAMD, dial the CNDD deactivation code.

Response: ISDN TCAP CNAMD is no longer functional.

Billing

If field SUSP in table AMAOPTS is set to ON, the operating company can specify AMA or NOAMA for the BILLING_OPTION prompt. If SUSP is set to OFF, the BILLING_OPTION is not prompted, and the NOAMA default is used.

A Bellcore format AMA record is produced for each CLASS SUSP display (CND, CNAMD) subscriber as scheduled through the CIDSUSPAUD entry in table AMAOPTS, or when SUSP is removed from the DN key.

The ISDN BRI line can use the existing CLASS SUSP billing format. For ISDN BRI lines assigned SUSP CNAMD but not assigned usage-sensitive CND, a billing record is generated only for CNAMD. This record includes the AVAIL and UNAVAIL counts of the CNAMD.

When the ISDN BRI subscriber has both SUSP CNAMD and SUSP CND assigned, billing records to be generated are dependent on office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG. When the office parameter is set to Y, a combined AMA record is produced for the CNAMD and CND features.

When ISDNBRI_CNAMD_CND_ONE_AMA is set to N, separate AMA records are generated for the CNAMD and CND features if they are both assigned to the BRI line on a SUSP basis and activated. Each record provides the calling information available and unavailable counts for the CLASS SUSP display features assigned to a subscriber's line.

Subscription usage sensitive pricing allows billing for the ISDN BRI CNAMD feature on a per-use basis rather than a flat-rate basis. An office-level control for SUSP is enabled in table AMAOPTS to allow the features the ability to generate SUSP billing records. In table RESFEAT, both the available and unavailable delivery counts are included with the ISDN BRI CNAMD feature tuple. The delivery count fields are read-only fields.

When an ISDN BRI subscriber has the SUSP display features, an activation and deactivation code must be dialed to activate or deactivate delivery of the

ISDN TCAP Calling Name Delivery (continued)

ISDN BRI SUSP display information. ISDN CNAMD uses the existing CNDA and CNDD dial access codes, from table IBNXLA, for activation and deactivation of the ISDN BRI display features.

A Bellcore format AMA record is also produced upon the removal or change of the AMA status of any CLASS SUSP Display feature, deleting the line from the office, or removing one or both of the SUSP features from the line.

This feature provides the ISDN BRI line the capability of using the existing CLASS SUSP billing formats. One enhancement is made by this feature to allow generation of separate AMA records for BRI subscribers who have both CNAMD and CND.

Record: structure code 110 / feature code 82

For ISDN BRI lines that are assigned SUSP CNAMD, but not assigned usage-sensitive CND, the billing record has the 110 structure code with 082 as the CLASS feature code (indicating CNAMD). The billing record includes the AVAIL and UNAVAIL counts of the CNAMD.

The peg counts for the CLASS display features are reported as follows:

- “AVAIL" count stores the number of times that a calling name was delivered to the subscriber.
- “UNAVAIL" count stores the number of times that out-of-area or private was delivered.

This feature provides an enhancement that allows the operating company to generate separate AMA records for SUSP CNAMD and SUSP CND when they are both assigned to a ISDN BRI subscriber. If office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG is set to N, separate AMA records are generated for the features as if the features were singly assigned.

The following figure is an example of an AMA record generated for call code 264.

Call code 264

```
HEX ID: AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C CLASS FEATURE:082C DATE:961019C
CONNECT TIME:1049386C NPA:619C DIR NUMBER:6221999C AVAIL
COUNT:000026C UNAVAIL COUNT:000005C
```

Record: structure code 110 / feature code 87 with module code 49

This feature provides the operating company the ability to generate combined AMA records for ISDN BRI subscribers assigned both SUSP CNAMD and SUSP CND, as is currently provided for RES subscribers.

If office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG is set to Y, combined CNAMD/CND AMA records will be generated for ISDN BRI lines assigned both SUSP CNAMD and SUSP CND. The billing record has the 110 structure code with 087 as the CLASS feature code. Also included in the combined AMA record is the module code 049 information which is appended to the 110 record. In this case, two sets of AVAIL and UNAVAIL counts are included in the AMA record. They are defined as follows:

- The first AVAIL count indicates the number of times that both a calling name and a calling number are delivered.
- The first UNAVAIL count indicates the number of times that neither a calling name nor a calling number is delivered.
- The second (049 portion) AVAIL count indicates the number of times a calling name but not a calling number is delivered (that is, CNAMD-only deliveries)
- The second (049 portion) UNAVAIL count indicates the number of times a calling number but not a calling name is delivered (that is, CND-only deliveries)

The following figure shows an AMA record generated for call code 264c.

ISDN TCAP Calling Name Delivery (continued)

Call code 264c

```
HEX ID: AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C CLASS FEATURE:087C DATE:92519C CONNECT
TIME:1049386C NPA:819C DIR NUMBER:6221999C AVAIL
COUNT:000026C UNAVAIL COUNT:000005C MODULE CODE:049C
AVAIL COUNT:000028C UNAVAIL COUNT:000003C MODULE
CODE:000C
```

Of ce data II

To produce an AMA record using structure code 110/call code 264 where CLASS feature code is 082:

- The BELLCORE AMA package must be present in the offfice.
- The SUSP entry in table AMAOPTS must be set to ON.
- CNAMD and CND features with AMA must be assigned to a line.
- CNAMD and CND must be enabled in table RESOFC.
- CNAMD and CND must be active on the subscriber's line.
- The CIDSUSPAUD entry in table AMAOPTS must be scheduled.
- ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG should be set to N.

  Note: When both CND and CNAMD are active, this office parameter must be set to N. When only CNAMD is active, this office parameter may be either Y or N.

To produce an AMA record for BRI subscribers with both SUSP CNAMD and SUSP CND using structure code 110/call code 264 where CLASS feature code is 087:

- The BELLCORE AMA package must be present in the offfice.
- The SUSP entry in table AMAOPTS must be set to ON.
- CNAMD and CND features with AMA must be assigned to a line.
- CNAMD and CND must be enabled in table RESOFC.
- CNAMD and CND must be active on the subscriber's line.
- The CIDSUSPAUD entry in table AMAOPTS must be scheduled.
- ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG should be set to Y.

Station Message Detail Recording

ISDN TCAP Calling Name Delivery does not affect Station Message Detail Recording.

Data lling of ce parameter s

The following table shows the office parameters used by ISDN TCAP Calling Name Delivery. For more information about office parameters, refer to *Office Parameters Reference Manual.*

Of ce parameter s used by ISDN TCAP Calling Name Delivery

Table name	Parameter name	Explanation and action
OFCENG	ISDNBRI_CNAMD_CND_ONE_AMA	This office parameter specifies whether one or two AMA records are to be generated when both CND and CNAMD are assigned on a SUSP basis and both features are active. The possible values for this boolean parameter are Y(es) and N(o). When set to Y, a combined AMA record is generated. When set to N, two separate records are generated.
Note: Set when feature not activated. The default value of this office parameter is N.		

Data ll sequence

The following table lists the tables that require datafill to implement ISDN TCAP Calling Name Delivery. The tables are listed in the order in which the datafill is to be entered.

Data ll tab les required for ISDN TCAP Calling Name Delivery (Sheet 1 of 2)

Table	Purpose of table
RESOFC	Residential Line CLASS Office Data contains data to globally enable CLASS features on a DMS-100 family switch.
CUSTNTWK	Customer Group Network contains data for enabling the operating company to assign or deny calling features to customer groups. This table specifies a network name (field NETNAME) associated with a customer group. This table provides a predetermined global numeric identifier (field NETCGID) within the specified NETNAME used for the customer group throughout the network.

ISDN TCAP Calling Name Delivery (continued)

Data ll tab les required for ISDN TCAP Calling Name Delivery (Sheet 2 of 2)

Table	Purpose of table
RESFEAT	Residential Enhanced Services Features. This table contains the assignment of CLASS features for residential lines. This table is automatically updated for each DN assigned CNAMD by SERVORD. The billing option is assigned here. This table is automatically updated by SERVORD.
IBNXLA	IBN Translation contains the stored data for specifying the digit translation of calls dialed from an IBN station, attendant console, incoming IBN trunk group, or incoming side of a two-way IBN trunk group.

Data lling tab le RESOFC

The following table shows the datafill specific to ISDN TCAP Calling Name Delivery for table RESOFC. Only those fields that apply directly to ISDN TCAP Calling Name Delivery are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le RESOFC (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
KEY		see subfield	Key. This field consists of the subfield FEATNAME, described as follows.
	FEATNAME	CNAMD	Feature name. This subfield is the key to the table. It specifies the name of the feature. Enter CNAMD.
ENABLED		Y or N	Enabled. This field specifies whether or not the feature is enabled in the office. Enter Y or N. ***Note:*** The default value for each CLASS feature included in the load is N (disabled).
FEATDATA		see subfields	Feature data. This field consists of the subfields ACCESS, FEATNAME and various subfields that are associated with each feature. For CNAMD, the subfields are ACCESS and FEATNAME, described as follows.

Data lling tab le RESOFC (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	ACCESS	SUBSCR	Feature access. This subfield specifies how the feature is accessed. SUBSCR indicates subscription access and is the only valid value for the CNAMD feature. (UNIVER indicates universal access for all RES lines.) Enter SUBSCR.
	FEATNAME	CNAMD	Feature name. This subfield specifies the feature name. Enter CNAMD.

Data ll e xample for table RESOFC

The following example shows sample datafill for table RESOFC.

MAP display example for table RESOFC

```
   KEY      ENABLED      FEATDATA      FNALANN
_____________________________________________

CNAMD            N       SUBSCR CNAMD      $
```

Data lling tab le CUSTNTWK

The following table shows the datafill specific to ISDN TCAP Calling Name Delivery for table CUSTNTWK. Only those fields that apply directly to ISDN

ISDN TCAP Calling Name Delivery (continued)

TCAP Calling Name Delivery are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le CUSTNTWK

Field	Subfield	Entry	Explanation and action
OPTIONS		see subfields (up to 13 multiples)	Options. This field consists of subfield OPTION and refinements.
	OPTION	CLID, TCAPNM	Option. This subfield lists options assigned to the customer group. • Option CLID assigns the feature BT0072 (Calling Line Identification) to a RES or ISDN customer group. • Option TCAPNM uses the TCAP CNAMD architecture to obtain calling name information for a RES or ISDN line with the CNAMD line option.
	CLIDOPT	INTRAGRP, ONNET, or OFFNET	CLID option. Enter INTRAGRP to indicate option CLID is available only to terminating agents in the same customer group as the originating agent. Enter ONNET to indicate option CLID is enabled on calls originating in the same network as option CLID that is associated with the called party. Enter OFFNET to indicate option CLID is enabled on all networked calls, regardless of their origin. Office parameter KSET_INTER_GRP_DISP of table OFCENG overrides the field CLIDOPT entry. For displays to work according to datafill in refinement CLIDOPT, office parameter KSET_INTER_GRP_DISP of table OFCENG is set to N.

Data ll e xample for table CUSTNTWK

The following example shows sample datafill for table CUSTNTWK.

MAP display example for table CUSTNTWK

```
    CUSTNAME NETNAME NETCGID DNREVXLA
                          OPTIONS
_____________________________________________________

ISDNGRP PUBLIC  1           $    (CLID OFFNET)    (TCAPNM)     $
```

Data lling tab le IBNXLA

The following table shows the datafill specific to ISDN TCAP Calling Name Delivery for table IBNXLA. Only those fields that apply directly to ISDN TCAP Calling Name Delivery are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le IBNXLA (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
KEY		see subfields	Key. This field consists of the subfields XLANAME and DGLIDX. These subfields must be entered in succession and are described as follows.
	XLANAME	1- to 8-characters	Translator name. This subfield specifies the 1- to 8-character name assigned to the translator.
	DGLIDX	65 or 85	Digilator index. This subfield specifies the digit or digits assigned to the index as the access code. Enter 65 for the activation code and 85 for the deactivation code.
RESULT		see subfields	Result. This field consists of the subfields TRSEL, ACR, SMDR, and FEATURE. These subfields are discussed as follows.
	TRSEL	FEAT	Translation selector. This subfield specifies the TRSEL. Enter FEAT.
	ACR	N	Account entry code. This subfield specifies whether or not an account entry code is required. Enter N.

ISDN TCAP Calling Name Delivery (continued)

Data lling tab le IBNXLA (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	SMDR	N	Station message detail recording. This subfield specifies whether or not SMDR is required. Enter N.
	FEATURE	CNDA, CNDD	Feature. This subfield specifies the name of the feature to which the code is assigned. Enter CNDA to indicate the access code for activating SUSP display features. Enter CNDD to indicate the access code for deactivating SUSP display features.

Data ll e xample for table IBNXLA

The following example shows sample datafill for table IBNXLA.

MAP display example for table IBNXLA

```
        KEY                     RESULT
_____________________________________________________

CXT1   65                       FEAT N N N CNDA
CXT1   85                       FEAT N N N CNDD
```

Translation veri cation tools

The following example shows the output from TRAVER (translations verification) command when it is used to verify ISDN TCAP Calling Name Delivery.

TRAVER output example for ISDN TCAP Calling Name Delivery

```
>TRAVER L 6211233 'B65' B
TABLE IBNLINES
   HOST 00 0 09 07 0 DP STN RES 6211233 0 $
TABLE LINEATTR
   0 1FR NONE NT FR01 0 613 P621 L613 TSPS 10 NIL NILSFC
            LATA1 0 NIL NIL 00 Y RESGRP 0 2
   LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE NCOS
RESGRP 2 0 0 RNCOS2 ( XLAS RXCMN2 NXLA RES ) $
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA,
VACTRMT, AND DIGCOL
RESGRP NXLA RESXLA RXCFN 0 RES
TABLE DIGCOL
   RES SPECIFIED: RES DIGIT COLLECTION
NCOS FEAT XLA NAME IS NIL.  GO TO NEXT XLA NAME.
TABLE IBNXLA: XLANAME RXCFN
   RXCFN 65 FEAT N N N ( CNDA )

++ TRAVER: SUCCESSFUL CALL TRACE ++
```

SERVORD

Assign the SERVORD option CNAMD either when a new line is being established using the SERVORD NEW or EST commands, or afterward with the ADO or ADD commands. You must add option CNAMD only to a DN key. Use the DEO command to delete the option and the CHF command to change the BILLING_OPTION if SUSP is set to ON in table AMAOPTS. Use the OUT command to out an ISDN BRI DN, at which time CNAMD is deleted automatically.

ISDN TCAP Calling Name Delivery (continued)

ISDN BRI CNAMD can be provisioned in two ways:

- as a flat-rate service option

  This feature is set up on a flat-rate basis by setting SUSP to OFF in table AMAOPTS or by setting SUSP to ON and specifying NOAMA (No Automatic Message Accounting) when assigning CNAMD.

- as a SUSP service option

  This feature is set up on a SUSP basis by setting option SUSP in table AMAOPTS to ON. When SUSP is ON, SERVORD returns a BILLING_OPTION prompt. Specify AMA at the prompt to generate a billing record. The default for the BILLING_OPTION prompt is NOAMA. Subscribers must use the access codes CNDA and CNDD to activate and deactivate CNAMD as a SUSP feature.

SERVORD limitations and restrictions

ISDN TCAP Calling Name Delivery has the following SERVORD limitation or restriction: the ISDN display features are supported only on National ISDN Protocol Version Control (PVC) Functional Issue 2 terminals.

SERVORD prompts

The following table shows the SERVORD prompts used to change ISDN TCAP Calling Name Delivery for an ISDN BRI subscriber.

SERVORD prompts for ISDN TCAP Calling Name Delivery

Prompt	Valid input	Explanation
OPTION	CNAMD	Assigns, updates, and removes the CNAMD feature.
BILLING_OPTION	AMA NOAMA	Indicates the billing option to be specified, if required, when assigning a feature to a RES line. To create an AMA record, enter AMA. To not create an AMA record, enter NOAMA.
Note: CND and DDN are incompatible features and cannot be assigned to the same line; however, CNAMD can be assigned to a line with either CND or DDN.		

The following tables are examples of how the operating company uses the SERVORD NEW command to provision CNAMD on an ISDN primary directory number (PDN) and on an ISDN secondary DN. For each DN assigned CNAMD, a separate tuple is created in table RESFEAT.

ISDN TCAP Calling Name Delivery (continued)

SERVORD example for adding ISDN TCAP Calling Name Delivery

The following SERVORD example shows how ISDN TCAP Calling Name Delivery is added to an ISDN PDN using the NEW command. In this example, option SUSP in table AMAOPTS is set to ON.

SERVORD example for ISDN TCAP Calling Name Delivery in prompt mode

```
>new
SONUMBER:      NOW  96  7  1 PM
>
DN:
>6755000
LCC_ACC:
>isdnkset
GROUP:
>isdngrp
SUBGRP:
>0
NCOS:
>0
SNPA:
>619
KEY:
>1
RINGING:
>y
LATANAME:
>lata1
LTG:   0
>
LEN_OR_LTID:
>isdn 20
OPTKEY:
>1
OPTION:
>CNAMD
BILLING_OPTION: NOAMA
>AMA
OPTKEY:
>$
```

SERVORD example for ISDN TCAP Calling Name Delivery in no-prompt mode

```
>new 6755000 isdnkset isdngrp 0 0 619 1 y lata1 isdn 20 1 CNAMD AMA $
```

ISDN TCAP Calling Name Delivery (continued)

SERVORD example for adding ISDN TCAP Calling Name Delivery

The following SERVORD example shows how ISDN TCAP Calling Name Delivery is added to a secondary DN using the NEW command. In this example, option SUSP in table AMAOPTS is set to ON.

SERVORD example for ISDN TCAP Calling Name Delivery in prompt mode

```
>new
SONUMBER:      NOW  96  7  1 PM
>
DN:
>6755001
LCC_ACC:
>isdnkset
GROUP:
>isdngrp
SUBGRP:
>0
NCOS:
>0
SNPA:
>619
KEY:
>2
RINGING:
>y
LATANAME:
>lata1
LTG:   0
>
LEN_OR_LTID:
>isdn 20
OPTKEY:
>2
OPTION:
>CNAMD
BILLING_OPTION: NOAMA
>NOAMA
OPTKEY:
>$
```

SERVORD example for ISDN TCAP Calling Name Delivery in no-prompt mode

```
>new 6755001 isdnkset isdngrp 0 0 619 2 y lata1 isdn 20 2 CNAMD NOAMA $
```

ISDN TCAP Calling Name Delivery (continued)

SERVORD example for adding ISDN TCAP Calling Name Delivery

The following SERVORD example shows how ISDN TCAP Calling Name Delivery is added to an ISDN PDN using the NEW command. In this example, option SUSP in table AMAOPTS is set to OFF.

SERVORD example for ISDN TCAP Calling Name Delivery in prompt mode

```
>new
SONUMBER:      NOW  96  7  1 PM
>
DN:
>6755000
LCC_ACC:
>isdnkset
GROUP:
>isdngrp
SUBGRP:
>0
NCOS:
>0
SNPA:
>619
KEY:
>1
RINGING:
>y
LATANAME:
>lata1
LTG:   0
>
LEN_OR_LTID:
>isdn 20
OPTKEY:
>1
OPTION:
>CNAMD
OPTKEY:
>$
```

SERVORD example for ISDN TCAP Calling Name Delivery in no-prompt mode

```
>new 6755000 isdnkset  isdngrp 0 0 619 1 y lata1 isdn 20 1 CNAMD $
```

ISDN TCAP Calling Name Delivery (continued)

SERVORD example for adding ISDN TCAP Calling Name Delivery

The following SERVORD example shows how ISDN TCAP Calling Name Delivery is added to a secondary DN using the NEW command. In this example, option SUSP in table AMAOPTS is set to OFF.

SERVORD example for ISDN TCAP Calling Name Delivery in prompt mode

```
>new
SONUMBER:      NOW  96  7  1 PM
>
DN:
>6755001
LCC_ACC:
>isdnkset
GROUP:
>isdngrp
SUBGRP:
>0
NCOS:
>0
SNPA:
>619
KEY:
>2
RINGING:
>y
LATANAME:
>lata1
LTG:   0
>
LEN_OR_LTID:
>isdn 20
OPTKEY:
>2
OPTION:
>CNAMD
OPTKEY:
>$
```

SERVORD example for ISDN TCAP Calling Name Delivery in no-prompt mode

```
>new 6755001 isdnkset isdngrp 0 0 619 2 y lata1 isdn 20 2 CNAMD $
```

Example of table RESFEAT for CNAMD with AMAOPTS SUSP

The following example shows a display of table RESFEAT for CNAMD with AMAOPTS SUSP.

Example of table RESFEAT for CNAMD with AMAOPTS SUSP

```
LINE       KEY    FEAT              VAR
_____________________________________________________________

ISDN 20    1      CNAMD             CNAMD NOAMA ACT  0 0
ISDN 20    2      CNAMD             CNAMD NOAMA ACT  0 0
```

LPIC_ISDN

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

LPIC_ISDN has no prerequisites.

Description

LPIC_ISDN is an ISDN BRI feature implementing intra-LATA PIC (LPIC) on a directory number or call type (DN/CT) basis. LPIC_ISDN permits the routing of intra-LATA calls on a DN/CT basis for 2B channel and NI-2 ISDN terminals.

The primary intra-LATA carrier options (LPIC) allow a subscriber to choose a carrier to provide their intra-LATA toll service.

The LPIC option provides the voice (VI) and circuit mode data (CMD) options on a DN/CT basis for 2B channel terminals for intra-LATA calls.

The precedence for determining the LPIC carrier from highest to lowest is DN/CT, line option, and on a customer group basis.

Operation

The new options for LPIC_ISDN require a modification to the VI and CMD options. The new options are VI_LPIC, VI_LPIC_CHOICE, CMD_LPIC, and CMD_LPIC choice. The options are added using the SERVORD utility for 2B channel and NI-2 ISDN terminals. Casual access calling (CAC) allows the subscriber to dial 10XXX or 101XXXX for reaching the LPIC on a DN/CT basis regardless of their PIC choice. The VI_LPIC_CHOICE and CMD_LPIC_CHOICE are the options to allow or disallow CAC.

The LPIC on DN/CT basis is datafilled through SERVORD in table DNATTRS. The LPIC from table DNATTRS overrides the LPIC against the DN. The LPIC line option is used if there is no information found in table DNATTRS. The LPIC is taken from the customer group if no line information is datafilled.

Translations table o w

LPIC_ISDN does not affect translations table flow.

Data ll e xample for LPIC_ISDN

Datafill table	Example data
DNATTRS	202 733 2345(BNR (NAME JOHN_DOE) $)(PUBLIC (SUPPRESS Y N) (NONUNIQUE) (NAME JACK_FLASH)$ (BC (SPEECH CARR1 Y (CARR1$) (3_1_KHZ CARR1 Y (CARR1) $)64KDATA CARR1 Y (CARR1) $) $) $

Limitations and restrictions

The following limitations and restrictions apply to LPIC_ISDN:

- The CMD option is assigned to a DN with line class code (LCC) of ISDNKSET only.
- The VI option is assigned to a DN with LCC of ISDNKSET only.
- SERVORD interface using the VI and CMD options is limited to 2B channel or NI-2 ISDN terminals.
- The LPIC option on a DN/CT basis for 1B channel ISDN terminals is made by datafilling table DNATTRS directly.
- The access to table DNATTRS for 2B channel ISDN terminals is restricted through SERVORD.
- CMD is incompatible with MADN groups.
- Inter-LATA full carrier toll denied (FCTDNTER) is not applicable to LPIC_ISDN because FCTDNTER restricts inter-LATA and International calls only.
- LPIC_ISDN is not applicable to ISDN BRI packet calls.

Interactions

The following paragraphs describe the interactions between LPIC_ISDN and other functionalities.

Toll Denied functionality

The carrier toll denied (CTD) and full carrier toll denied intra-LATA (FCTDNTRA) provide functionality with intra-LATA traffic. The routing of intra-LATA calls on a DN/CT basis does not affect the functionality of CTD or FCTDNTRA. The DN/CT determines the set of carriers for routing intra-LATA calls from a DN.

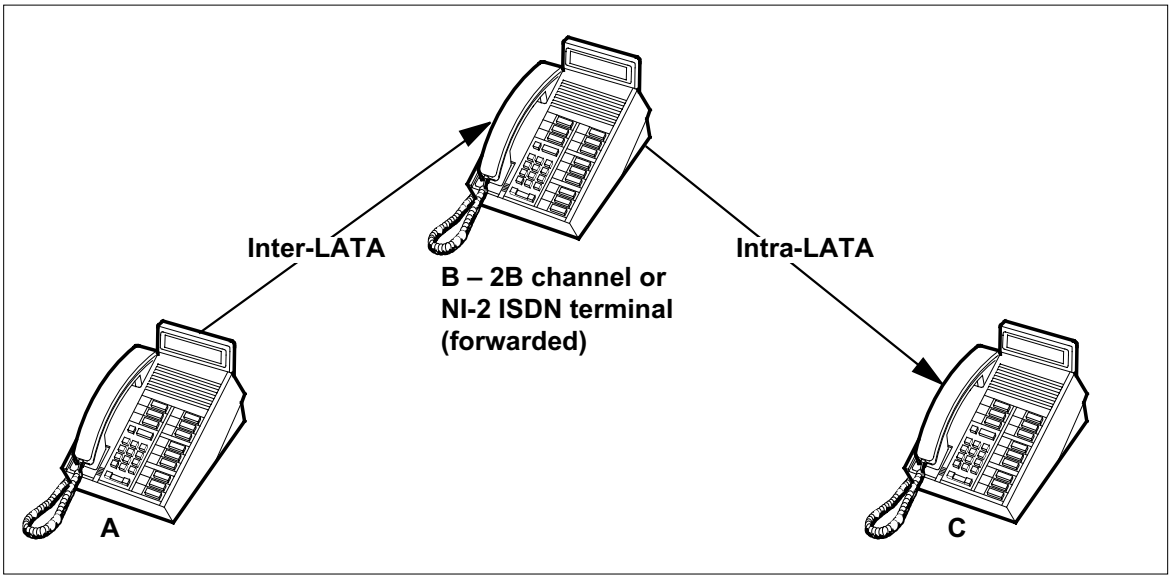
The CTD option interacts with LPIC on a DN/CT basis in the same way as the LPIC line option. The CTD option restricts carriers from routing calls.

LPIC_ISDN (continued)

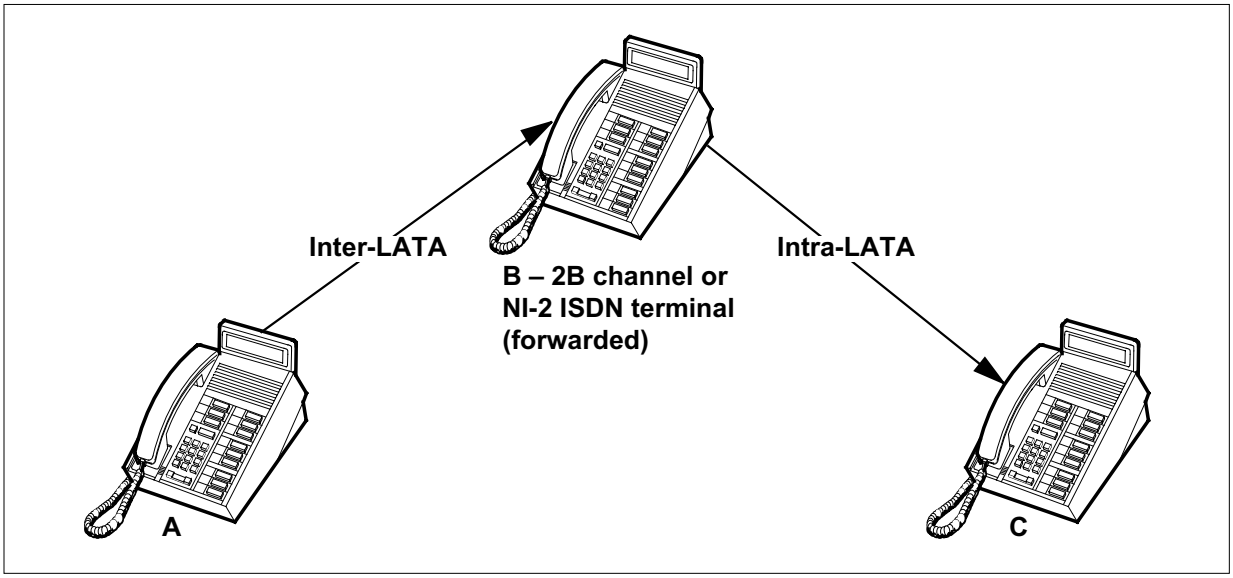
The FCTDNTRA option interacts with LPIC on a DN/CT basis in the same way as the LPIC line option. The FCTDNTRA option restricts carriers from routing intra-LATA calls.

Call Forwarding

The following call scenario involves call forwarding to intra-LATA numbers.Caller A makes a call to terminal B using PIC. Terminal B is call forwarded to terminal C in the same LATA. The table DNATTRS identifies the LPIC carrier on a DN/CT basis for terminal B. The call completes using the LPIC carrier.



In the following call scenario caller A extends a call to terminal B. The terminal B is forwarded to terminal C intra-LATA. The intra-LATA carrier for terminal B is datafilled by a DN/CT basis. The second leg of the call uses the LPIC from table DNATTRS for terminal B to complete the call.



Activation/deactivation by the end user

LPIC_ISDN requires no activation or deactivation by the end user.

Billing

LPIC_ISDN does not affect billing.

Station Message Detail Recording

LPIC_ISDN does not affect Station Message Detail Recording.

Data lling of ce parameter s

LPIC_ISDN does not affect office parameters.

Data ll sequence

The following table lists the tables that require datafill to implement LPIC_ISDN. The tables are listed in the order in which they are to be datafilled.

Data ll tab le required for LPIC_ISDN

Table	Purpose of table
DNATTRS	Directory Number Attributes. This table contains directory number (DN) attributes for specific DNs.
Note: This table is datafilled through SERVORD; therefore no datafill procedure is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.	

LPIC_ISDN (continued)

Data lling tab le DNATTRS

The following table shows the datafill specific to LPIC_ISDN for table DNATTRS. Only those fields that apply directly to LPIC_ISDN are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le DNATTRS

Field	Subfield or refinement	Entry	Explanation and action
OPTDATA		see subfields	Optional data.Field OPTDATA consists of subfields SEL, CTDATA, and BCDATA. This vector contains up to two selector names and their attributes. This field is a vector of up to two multiples. Each multiple holds a selector and other information depending on the selector value. If the NIL selector applies ($), no additional data is in the OPTDATA field.
	SEL	CT or BC	Selector field. This field contains the selector field of the OPTDATA area. If the optional data is based on DN and call type (DN/CT), enter CT and datafill refinement CTDATA. If the option data is based on DN and bearer capability (DN/BC), enter BC and datafill refinement BCDATA.
	CTDATA		Call Type Data.This field consists of subfields CALLTYPE and CTOPTS. This vector consists of up to two multiples.

OPTDATA SEL = CT

If the entry in subfield SEL is CT, datafill refinement CTDATA. Refer to the following table.

Field descriptions for conditional data II (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	CTDATA		Call type data.This field consists of subfields CALLTYPE and CTOPTS. This vector consists of up to two multiples.
	CALLTYPE	VBINFO CMDATA	Call type.Enter VBINFO for voice band information (SPEECH, 3.1KHZ and 7KHZ bearer capabilities). Enter CMDATA for circuit mode data. Any combination of current DN and call type options are valid for both call type identifiers. If a call type identifier is not specified for a DN, the default option values for the VBINFO and CMDATA call-types apply for ISDN basic rate access (BRA).
	CTOPTS	see subfield	Call type options.This subfield holds the DN and call type options. It consists of refinement CTOPTID. This vector consists of seven multiples.
	CTOPTID	ICTLPIC	Call type option identifier.Enter the DN/CT options as explained below.
	CTLPIC	alphanumeric	Call type intra-LATA carrier.If the entry in subfield CTOPTID is CTLPIC, enter the refinement for the primary intra-LATA carrier (PIC) name that is datafilled in table OCCNAME. The LPIC from the line option identifies the carrier if the carrier for the DN is unavailable. The LPIC from the customer group identifies the LPIC if the datafill is unavailable for the line option.

LPIC_ISDN (continued)

Field descriptions for conditional data ll (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
			Enter CTLPIC (call type primary intra-LATA carrier) to indicate that the network associates one primary intra-LATA carrier for each DN/CT.
	CTLPIC_ Choice	Y, N	Call type intra-LATA carrier_choiceIf the entry in subfield CTOPTID is CTLPIC, enter the refinement call type LPIC_Choice set to Y to allow casual access calling (CAC). Enter N to disallow CAC.

Data ll e xample for table DNATTRS

The following example shows sample datafill for DNATTRS.

MAP display example for table LPIC_ISDN with options DN/BC and CTLPIC

```
KEY       DATA
                    OPTDATA
_____________________________________________________________________

202 733 2345
(BNR     ( NAME JOHN_DOE) $)
(PUBLIC ( SUPPRESS Y N) (NONUNIQUE ) (NAME JACK_FLASH)
$(BC(SPEECH CARR1 Y (CARR1$)  (3_1_KHZ CARR1 Y (CARR1) $)
64KDATA CARR1 Y (CARR1) $)$)$
```

Translation veri cation tools

The following example shows the output from TRAVER when it is used to verify LPIC_ISDN.

The example shows TRAVER outputs for

- an intra-LATA voice call from a 2B channel ISDN terminal routing on DN/CT basis
- an intra-LATA 64kbit/s data call from a 2B channel ISDN terminal routing on a DN/CT basis

- an intra-LATA voice CAC call from a 2B ISDN terminal routing on a DN/CT basis
- an intra-LATA 64 kbit/s data CAC call from a 2B channel ISDN terminal routing on a DN/CT basis

Intra-LATA voice call

The following example shows the output from TRAVER of an intra-LATA voice call from a 2B channel ISDN terminal. The routing is on a DN/CT basis.

TRAVER output example for LPIC_ISDN intra-LATA voice call

```
traver l 6215901 98880040 bc speech b
Warning:Routing characteristics are present.
   Originator must be able to send in characteristics specified.
TABLE KSETLINE
ISDN 11 DN Y 6215901 IBNTST 0 0 613 (SFC) $
Table DNATTRS
613 621 5901
  (PUBLIC (NAME ISDN1_5317) $)$
  (BC(SPEECH (CARR3 CARR4 Y)$) (64KDATA(CARR5 CARR6 Y) $)$)$
TABLE DNGRPS
TUPLE NOT FOUND
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP_PODP
AIN Orig Attempt TDP: no suscribed trigger.
TABLE NCOS
IBNTST 0 0 0 TST10 (XLAS CXT1 RXCFN NDGT) (OHQ 0 TONE_OHQ) (CBQ 0 1 Y 2)
(ERWT) (ACR N)$
TABLE CUSTHEAD:CUSTGRP, PRELIMXLA,CUSTXLA,FEATXLA, VACTRMT, AND DIGCOL
IBNTST NXLA CXT3 RXCFN 0 TST1
TABLE DIGCOL
TST1 9 POTS Y
TABLE IBNXLA: XLANAME CXT1
CXT1 9 NET N Y N 1 Y NDGT N Y GEN (LATTR O) (EA CARR7 Y 0)$$
TABLE DIGCOL
NDGT specified:digits collected individually
TABLE LINEATTR
0 1FR NONE NT FRO1 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 O NIL
NIL 00 Y RESGRP 0 2 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
```

—continued—

LPIC_ISDN (continued)

TRAVER output example for LPIC_ISDN intra-LATA voice call (continued)

```
Table STDPRTCT
P621 (1) (65021) 0
 SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
 88 910 N NP 0 NA
 SUBTABLE AMAPRT
 KEY NOT FOUND
 DEFAULT VALUE IS:  NONE OVRNONE N
TABLE HNPACONT
613 Y 128 2 (43) (1) (0) (0) 0
 SUBTABLE HNPACODE
 888 888 LRTE 13
AIN Info Collected TDP: no subscribed trigger.
Table TRIGGRP TRIGGRP_PODP INFOANAL
 PODP (DG PODPDIG) $ NIL
Trigger R01 PODP is applicable to office.
AIN Info Analyzed TDP: trigger criteria not met.
 SUBTABLE RTEREF
  13 N D OLAMADCM 3 817 N
EXIT TABLE RTEREF
EXIT TABLE HNPACONT
TABLE LCASCRCN
613 L613 (28) OPTL N
 SUBTABLE LCASCR
 TUPLE NOT FOUND.  DEFAULT IS NON-LOCAL
TABLE PFXTREAT
TUPLE NOT FOUND.  DEFAULT IS TO LEAVE XLA RESULT UNCHANGED
TABLE CLSVSCRC
TABLE KSETFEAT
ISDN 1 PIC PIC CARR1 N
TABLE KSETFEAT
ISDN 11 LPIC LPIC CARR2 N
OVERLAP CARRIER SELECTION (OCS) APPLIES
TABLE LATAXLA ( No entry identifies the call as intra-LATA intraSTATE)
TUPLE NOT FOUND
ASSUMED TO BE DEFAULT intra-LATA intraSTATE STD
```

—continued—

TRAVER output example for LPIC_ISDN intra-LATA voice call (continued)

```
TABLE OCCINFO
CARR4 0222 TRANS Y Y Y Y Y N N Y Y Y Y LONG 0 FGRPD N N N N N N N
N Y N N N N
TABLE EASAC
TUPLE NOT FOUND
 Using Equal Access (EA) route OFRT 889 from Pretranslation
AIN Info Collected TDP: no subscribed trigger.
TABLE TRIGGRP
TRIGGRP_PODP INFOANAL
 PODP (DG PODPDIG)$ NIL
Trigger R01 PODP is applicable to office.
AIN Info Analyzed TDP: trigger criteria not met.
TABLE OFRT
889 CND EA INTNL SK 3
  S D OGEAC4
  S D ISUP2WC4
  CND ALWAYS SK 2
  ND OGEAC4 15 D121 N
  ND ISUP2WC4 0 D121 N
EXIT TABLE OFRT

+++TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 OGEAC4       8880040      ST
2 ISUP2WC4     8880040      ST

TREATMENT ROUTES.  TREATMENT IS:GNCT
1 T120


+++TRAVER SUCCESSFUL CALL TRACE+++
```

—end—

Intra-LATA 64 kibt/s data call

The following example shows the output from TRAVER of an intra-LATA 64 kbit/s data call from a 2B channel ISDN terminal. The routing is on a DN/CT basis.

LPIC_ISDN (continued)

TRAVER output example for LPIC_ISDN intra-LATA 64 kbit/s data call

```
traver l 6215901 98880040 bc 64Kdata b
Warning:Routing characteristics are present.
   Originator must be able to send in characteristics specified.

TABLE KSETLINE
ISDN 11 DN Y 6215901 IBNTST 0 0 613 (SFC) $
TABLE DNATTRS
613 6215901
  (PUBLIC (NAME ISDN1_5317) $)$
  (BC(SPEECH (CARR3 CARR4 Y)$) (64KDATA(CARR5 CARR6 Y) $)$)$
TABLE DNGRPS
TUPLE NOT FOUND
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP_PODP
AIN Orig Attempt TDP: no subscribed trigger.
TABLE NCOS
IBNTST 0 0 0 TST10 (XLAS CXT1 RXCFN NDGT) (OHQ 0 TONE_OHQ) (CBQ 0 1 Y 2)
(ERWT) (ACR N)$
TABLE CUSTHEAD:CUSTGRP, PRELIMXLA,CUSTXLA,FEATXLA, VACTRMT, AND DIGCOL
IBNTST NXLA CXT3 RXCFN 0 TST1
TABLE DIGCOL
TST1 9 POTS Y
TABLE IBNXLA: XLANAME CXT1
CXT1 9 NET N Y N 1 Y NDGT N Y GEN (LATTR O) (EA CARR7 Y 0)$$
TABLE DIGCOL
NDGT specified:digits collected individually
TABLE LINEATTR
0 1FR NONE NT FRO1 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 O NIL
NIL 00 Y RESGRP 0 2 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
```

—continued—

TRAVER output example for LPIC_ISDN intra-LATA 64 kbit/s data call (continued)

```
Table STDPRTCT
P621 (1) (65021) 0
 SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
 88 910 N NP 0 NA
 SUBTABLE AMAPRT
 KEY NOT FOUND
 DEFAULT VALUE IS:  NONE OVRNONE N
TABLE HNPACONT
613 Y 128 2 (43) (1) (0) (0) 0
 SUBTABLE HNPACODE
 888 888 LRTE 13
AIN Info Collected TDP: no subscribed trigger.
Table TRIGGRP
 TRIGGRP_PODP INFOANAL
 PODP (DG PODPDIG) $
Trigger R01 PODP is applicable to office.
AIN Info Analyzed TDP: trigger criteria not met.
 SUBTABLE RTEREF
  13 N D OLAMADCM 3 817 N
 EXIT TABLE RTEREF
EXIT TABLE HNPACONT
TABLE LCASCRCN
613 L613 (28) OPTL N
 SUBTABLE LCASCR
 TUPLE NOT FOUND.  DEFAULT IS NON-LOCAL
TABLE PFXTREAT
TUPLE NOT FOUND. DEFAULT IS TO LEAVE XLA RESULT UNCHANGED
TABLE CLSVSCRC
TABLE KSETFEAT
ISDN 1 PIC PIC CARR1 N
TABLE KSETFEAT
ISDN 1 1 LPIC LPIC CARR2 N
OVERLAP CARRIER SELECTION (OCS) APPLIES
TABLE LATAXLA ( No entry identifies the call as intra-LATA intraSTATE)
TUPLE NOT FOUND
ASSUMED TO BE DEFAULT intra-LATA intraSTATE STD
```

—continued—

LPIC_ISDN (continued)

TRAVER output example for LPIC_ISDN intra-LATA 64 kbit/s data call (continued)

```
TABLE OCCINFO
CARR6 0288 FGC Y Y Y Y N N N Y Y Y Y LONG 0 FGRPC N N N N N
 N N N Y N N N N
TABLE EASAC
TUPLE NOT FOUND
TABLE STDPRTCT
P621 (1) (65021) 0
 SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
10288 10288 EA DD 5 P CARR6A CARR6 Y OFRT 888 6 20 N
  TABLE OFRT
  888 CND EA INTNL SK 2
    S D OGEAC6
    CND ALWAYS SK 1
    TS D OGEAC6 0 1 N 6 N
    EXIT TABLE OFRT
TABLE STDPRTCT
CARR6A (1) (65021) 0
 SUBTABLE STDPRT
WARNING CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
  8 9 EA DD 0 T NA CARR6 N
Using Equal Access (EA) route OFRT 888 from Pretranslation
AIN Info Collected TDP: no subscribed trigger.
TABLE TRIGGRP
TRIGGRP_PODP INFOANAL
 PODP (DG PODPDIG)$ NIL
Trigger R01 PODP is applicable to office.
AIN Info Analyzed TDP: trigger criteria not met.
TABLE OFRT
888 CND EA INTNL SK 2
 SD OGEAC6
CND ALWAYS SK 1
TS D OGEAC6 O 1 N 6 N
EXIT TABLE OFRT

+++TRAVER successful CALL TRACE+++

DIGIT TRANSLATIONS ROUTES
1 OGEAC6     8880040    ST
TREATMENT ROUTES.  TREATMENT IS:GNCT
1 T120
+++TRAVER SUCCESSFUL CALL TRACE+++
```

—end—

Intra-LATA voice CAC call

The following example shows the output from TRAVER of an intra-LATA voice CAC call from a 2B channel ISDN terminal. The routing is on a DN/CT basis. The CAC routes even though CHOICE is set to no on the LPIC line option for 6215901. The LPIC CHOICE on the line is overridden by the VI LPIC CHOICE in table DNATTRS.

TRAVER output example for LPIC_ISDN intra-LATA voice CAC call

```
traver l 6215901 9102888880040 bc speech b
Warning:Routing characteristics are present.
   Originator must be able to send in characteristics specified.
TABLE KSETLINE
ISDN 11 DN Y 6215901 IBNTST 0 0 613 (SFC) $
Table DNATTRS
613 6215901
  (PUBLIC (NAME ISDN1_5317) $)$
  (BC(SPEECH (CARR3 CARR4 Y)$) (64KDATA(CARR5 CARR6 Y) $)$)$
Override LPIC CHOICE on the line
TABLE DNGRPS
TUPLE NOT FOUND
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP TRIGGRP_PODP
AIN Orig Attempt TDP: no suscribed trigger.
TABLE NCOS
IBNTST 0 0 0 TST10 (XLAS CXT1 RXCFN NDGT) (OHQ 0 TONE_OHQ) (CBQ 0 1 Y 2)
(ERWT) (ACR N)$
TABLE CUSTHEAD:CUSTGRP,PRELIMXLA,CUSTXLA,FEATXLA,VACTRMT,AND DIGCOL
IBNTST NXLA CXT3 RXCFN 0 TST1
TABLE DIGCOL
TST1 9 POTS Y
TABLE IBNXLA: XLANAME CXT1
CXT1 9 NET N Y N 1 Y NDGT N Y GEN (LATTR O) (EA CARR7 Y 0)$$
TABLE DIGCOL
NDGT specified: digits collected individually
TABLE LINEATTR
0 1FR NONE NT FRO1 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 0 NIL NIL 00
Y RESGRP 0 2 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
```

—continued—

LPIC_ISDN (continued)

TRAVER output example for LPIC_ISDN intra-LATA voice CAC call (continued)

```
Table STDPRTCT
P621 (1) (65021)0
 SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
 10288 10288 EA DD 5 P CARR6A CARR6 Y OFRT 888 6 20 N
TABLE OFRT
888 CND EA INTNL SK 2
  S D OGEAC6
  CND ALWAYS SK 1
  TS D OGEAC6 0 1 N 6 N
 EXIT TABLE OFRT
TABLE STDPRTCT
 CARR6A (1) (65021) 0
  SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
  8 9 EA DD 0 T NA CARR6 N
 SUBTABLE AMAPRT
 KEY NOT FOUND
 DEFAULT VALUE IS:  NONE OVRNONE N
TABLE HNPACONT
613 Y 128 2 (43) (1) (0) (0) 0
 SUBTABLE HNPACODE
 888 888 LRTE 13
 SUBTABLE RTEREF
  13 N D OLAMADCM 3 817 N
 EXIT TABLE RTEREF
EXIT TABLE HNPACONT
TABLE LCASCRCN
613 L613 (28) OPTL N
 SUBTABLE LCASCR
 TUPLE NOT FOUND.  DEFAULT IS NON-LOCAL
TABLE PFXTREAT
TUPLE NOT FOUND. DEFAULT IS TO LEAVE XLA RESULT UNCHANGED
TABLE CLSVSCRC
OVERLAP CARRIER SELECTION (OCS) APPLIES
TABLE LATAXLA ( No entry identifies the call as intra-LATA intraSTATE)
TUPLE NOT FOUND
ASSUMED TO BE DEFAULT intra-LATA intraSTATE STD
TABLE OCCINFO
CARR6 0288 FGC Y Y Y Y N N N Y Y Y Y LONG 0 FGRPC N N N N N N N
N Y N N N N
```

—continued—

TRAVER output example for LPIC_ISDN intra-LATA voice CAC call (continued)

```
TABLE EASAC
TUPLE NOT FOUND
 Using Equal Access (EA) route OFRT 888 from Pretranslation
AIN Info Collected TDP: no subscribed trigger.
TABLE TRIGGRP
TRIGGRP_PODP INFOANAL
 PODP (DG PODPDIG)$ NIL
Trigger R01 PODP is applicable to office.
AIN Info Analyzed TDP: trigger criteria not met.
TABLE OFRT
888 CND EA INTNL SK 2
  S D OGEAC6
  CND ALWAYS SK 1
  TS D OGEAC6 0 1 N 6 N
EXIT TABLE OFRT

+++TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 OGEAC6       8880040      ST

TREATMENT ROUTES.  TREATMENT IS:GNCT
1 T120

+++TRAVER SUCCESSFUL CALL TRACE+++
```

—end—

Intra-LATA 64 kbit/s data CAC call

The following example shows the output from TRAVER of an intra-LATA 64 kbit/s data CAC call from a 2B channel ISDN terminal. The routing is on a DN/CT basis. The CAC call routes even though CHOICE was set to no on the LPIC line option for 6215901. LPIC CHOICE on the line is overridden by the CMD LPIC CHOICE in table DNATTRS.

LPIC_ISDN (continued)

TRAVER output example for LPIC_ISDN intra-LATA 64 kbit/s data CAC call

```
traver l 6215901 9102228880040 bc speech b
Warning:Routing characteristics are present.
   Originator must be able to send in characteristics specified.
Table KSETLINE
ISDN 11 DN Y 6215901 IBNTST 0 0 613 (SFC) $
Table DNATTRS
613 6215901
  (PUBLIC (NAME ISDN1_5317) $)$
  (BC(SPEECH (CARR3 CARR4 Y)$) (64KDATA(CARR5 CARR6 Y) $)$)$
Override LPIC CHOICE on the line
TABLE DNGRPS
TUPLE NOT FOUND
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP TRIGGRP_PODP
AIN Orig Attempt TDP: no suscribed trigger.
TABLE NCOS
IBNTST 0 0 0 TST10 (XLAS CXT1 RXCFN NDGT) (OHQ 0 TONE_OHQ) (CBQ 0 1 Y 2)
(ERWT) (ACR N)$
TABLE CUSTHEAD:CUSTGRP,PRELIMXLA,CUSTXLA,FEATXLA,VACTRMT,AND DIGCOL
IBNTST NXLA CXT3 RXCFN 0 TST1
TABLE DIGCOL
TST1 9 POTS Y
TABLE IBNXLA: XLANAME CXT1
CXT1 9 NET N Y N 1 Y NDGT N Y GEN (LATTR O) (EA CARR7 Y 0)$$
TABLE DIGCOL
NDGT specified: digits collected individually
TABLE LINEATTR
0 1FR NONE NT FRO1 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 0 NIL NIL 00
Y RESGRP 0 2 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
```

—continued—

TRAVER output example for LPIC_ISDN intra-LATA 64 kbit/s data CAC call (continued)

```
Table STDPRTCT
P621 (1) (65021)0
 SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
 10222 10222 EA DD 5 P CARR4A CARR6 4 OFRT 889 6 20 Y
TABLE OFRT
889 CND EA INTNL SK 3
  S D OGEAC4
  S D ISUP2WC4
  CND ALWAYS SK 2
  N D OGEAC4 15 D121 N
  ND ISUP2WC4 0 D121 N
 EXIT TABLE OFRT
TABLE STDPRTCT
 CARR4A (1) (65021) 0
  SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING.  CALL TYPE
DEFAULT IS NP.  PLEASE REFER TO DOCUMENTATION.
  8 9 EA DD 0 T NA CARR4 N
 SUBTABLE AMAPRT
 KEY NOT FOUND
 DEFAULT VALUE IS:  NONE OVRNONE N
TABLE HNPACONT
613 Y 128 2 (43) (1) (0) (0) 0
 SUBTABLE HNPACODE
 888 888 LRTE 13
 SUBTABLE RTEREF
  13 N D OLAMADCM 3 817 N
 EXIT TABLE RTEREF
EXIT TABLE HNPACONT
TABLE LCASCRCN
613 L613 (28) OPTL N
 SUBTABLE LCASCR
 TUPLE NOT FOUND.  DEFAULT IS NON-LOCAL
TABLE PFXTREAT
TUPLE NOT FOUND. DEFAULT IS TO LEAVE XLA RESULT UNCHANGED
TABLE CLSVSCRC
OVERLAP CARRIER SELECTION (OCS) APPLIES
TABLE LATAXLA ( No entry identifies the call as intra-LATA intraSTATE)
TUPLE NOT FOUND
ASSUMED TO BE DEFAULT intra-LATA intraSTATE STD
```

—continued—

LPIC_ISDN (continued)

TRAVER output example for LPIC_ISDN intra-LATA 64 kbits data CAC call (continued)

```
TABLE OCCINFO
CARR4 0222 TRANS Y Y Y Y Y N N Y Y Y Y LONG 0 FGRPD N N N N N N N
N Y N N N N
TABLE EASAC
TUPLE NOT FOUND
 Using Equal Access (EA) route OFRT 889 from Pretranslation
AIN Info Collected TDP: no subscribed trigger.
TABLE TRIGGRP
TRIGGRP_PODP INFOANAL
 PODP (DG PODPDIG)$ NIL
Trigger R01 PODP is applicable to office.
AIN Info Analyzed TDP: trigger criteria not met.
TABLE OFRT
889 CND EA INTNL SK 3
  SD OGEAC4
  SD ISUP2WC4
  CND ALWAYS SK 2
  ND OGEAC4 15 D121 N
  ND ISUP2WC4 0 D121 N
EXIT TABLE OFRT

+++TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 OGEAC4       8880040      ST
2 ISUP2WC4     8880040      ST

TREATMENT ROUTES.  TREATMENT IS:GNCT
1 T120


+++TRAVER SUCCESSFUL CALL TRACE+++
```

—end—

SERVORD

SERVORD is used to assign the following options:

- CMD
- VI

LPIC_ISDN provides the capability of routing intra-LATA ISDN VI and CMD calls on a DN/CT basis. The assignment of the options is made through SERVORD.

The options CMD_LPIC, CMD_LPIC_CHOICE, VI_LPIC and VI_LPIC_CHOICE provide the routing on a DN/CT basis for intra-LATA calls. These options are datafilled under the CMD and VI options for 2B and NI-2 ISDN terminals.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to LPIC_ISDN:

- CMD is incompatible with multiple appearance directory number (MADN).
- CMD or VI assignment to a DN is limited to the line class code (LCC) of ISDNKSET and to 2B channel or NI-2 ISDN terminals.
- Access to table DNATTRS is restricted through SERVORD only for 2B channel ISDN terminals.
- Intra-LATA full carrier toll denied (FCTDNTRA) is not applicable to LPIC_ISDN.
- VI and CMD is not applicable to ISDN BRI packet calls.

SERVORD prompts

The following table shows the SERVORD prompts used to assign CMDoption for LPIC_ISDN.

SERVORD prompts for option CMD for LPIC_ISDN (Sheet 1 of 2)

Prompt	Valid input	Explanation
DN	7 or 10 digits entered without spaces or hyphens	Directory number.
LCC	ISDNKSET	Line class code.
GROUP	1 to 16 alphanumeric characters	Group.
SUBGROUP	0 to 7	Subgroup.
NCOS	0 to 255	Network class of service.
SNPA	3-digit number	Service numbering plan area code.

LPIC_ISDN (continued)

SERVORD prompts for option CMD for LPIC_ISDN (Sheet 2 of 2)

Prompt	Valid input	Explanation
KEY	1 to 69	Key.
RINGING	Y or N	Ringing.
LATANAME	Alphanumeric	The local access transport area (LATA) name associated with the originator of the call.
LTG	0 to 255 Default 0	Line treatment group. A number that allows the translator to distinguish between customer lines with the same LCC, but different screening and routing patterns.
LEN_or_LTID	1 to 8 alphanumeric digits, a space, and a terminal number (1 to 1022)	Line equipment number or logical terminal identifier. An LTID consists of a logical terminal group and a terminal number.
OPTKEY	1 to 69	Option key. Key associated with the option.
OPTION	CMD	Option. Enter CMD for circuit mode data.
CMD_RATE	56, 64, BOTH	Circuit mode data rate access speed.56 = 56 kbit/s data64 = 64 kbit/s dataBOTH = 56 kbit/s data and 64 kbit/s data
CMD_PIC	$ or any valid name from table OCCNAME	Circuit mode data (CMD) primary inter-LATA carrier (PIC). Enter the CMD PIC carrier name.
CMD_LPIC	$ or any valid name from table OCCNAME	Circuit mode data (CMD) primary intra-LATA carrier (LPIC). Enter the CMD LPIC carrier name.
CMD_LPIC CHOICE	Y or NDefault is N	Casual access calling is allowed.

SERVORD example for LPIC_ISDN

The following SERVORD example shows how CMD for LPIC_ISDN is added to a DN using the NEW command.

SERVORD example for option CMD for LPIC_ISDN in prompt mode

```
>NEW
SONUMBER:  NOW 97 7 25 5 PM
> (CR)
DN
> 6755000
LCC
> ISDNKSET
Group:
> IBNTST
SUBGRP:
> 1
NCOS:
> 0
SNPA
> 619
KEY
> 1
RINGING
> Y
LATANAME
> LATA1
LTG
> 0
LEN_OR_LTID
ISDN  20
OPTKEY
1
OPTION
CMD
CMD_RATE
56
CMD_PIC
CARR1
CMD_LPIC
CARR2
CMD_LPIC_CHOICE
Y
OPTKEY
$
```

SERVORD example for option CMD for LPIC_ISDN in no-prompt mode

```
> NEW $ 6755000 ISDNKSET IBNTST 1 0 619 1 Y LATA1 0 ISDN 20 1
CMD 56 CARR1 CARR2 Y $
```

LPIC_ISDN (continued)

SERVORD prompts

The following table shows the SERVORD prompts used to assign VI option for LPIC_ISDN.

SERVORD prompts for LPIC_ISDN (Sheet 1 of 2)

Prompt	Valid input	Explanation
DN	7 or 10 digits entered without spaces or hyphens	Directory number.
LCC	ISDNKSET	Line class code.
Group	1 to 16 alphanumeric characters	Group.
SUBGROUP	0 to 7	Subgroup.
NCOS	0 to 255	Network class of service
SNPA	3-digit number	Service numbering plan area code.
KEY	1 to 69	Key.
Ringing	Y or N	Ringing.
LATANAME	alphanumeric	The local access transport area (LATA) name associated with the originator of the call.
LTG	0 to 255 Default 0	Line treatment group. A number that allows the translator to distinguish between customer lines with the same LCC, but different screening and routing patterns.
LEN_or_LTID	1 to 8 alphanumeric digits, a space, and a terminal number (1 to 1022)	Line equipment number or logical terminal identifier. An LTID consists of a logical terminal group and a terminal number.
OPTKEY	1 to 69	Option key. Key associated with the option.
OPTION	VI	Option. Enter VI for voice band information option.
VI_PIC	$ or any valid name from table OCCNAME	Voice band information (VI) primary inter-LATA carrier (PIC). Enter the VI PIC carrier name.

SERVORD prompts for LPIC_ISDN (Sheet 2 of 2)

Prompt	Valid input	Explanation
VI_LPIC	$ or any valid name from table OCCNAME	VI primary intra-LATA carrier (LPIC). Enter the VI_ LPIC carrier name.
VI_LPIC_ CHOICE	Y or NDefault is N	Casual access is allowed.

SERVORD example for VI option forLPIC_ISDN

The following SERVORD example shows how option VI forLPIC_ISDN is added to a DN using the NEW command.

LPIC_ISDN (end)

SERVORD example for option VI for LPIC_ISDN in prompt mode

```
>NEW
SONUMBER:  NOW 97 7 25 5 PM
> (CR)
DN
> 6755000
LCC
> ISDNKSET
GrOUP:
> IBNTST
SUBGRP:
> 1
NCOS
> 0
SNPA
> 619
KEY
> 1
RINGING
> Y
LATANAME
> LATA1
LTG
> 0
LEN_OR_LTID
ISDN 20
OPTKEY
1
OPTION
VI
VI_PIC
CARR1
VI_LPIC
CARR1
VI_LPIC_CHOICE
Y
OPTKEY
$
```

SERVORD example for LPIC_ISDN in no-prompt mode

```
> NEW $ 6755000 ISDNKSET IBNTST 1 0 619 1 Y LATA1 0 ISDN 20 1 VI
CARR1 CARR1 Y $
```

MADN/EKTS Call Appearance Call Handling (CACH)

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: NI000051

Release applicability

NA010 and up

Prerequisites

To operate, MADN/EKTS Call Appearance Call Handling (CACH) has the following prerequisites:

- MADN/EKTS Call Appearance Call Handling-Call Processing
- MADN/EKTS Call Appearance Call Handling-Service Order
- MADN/EKTS Call Appearance Call Handling-Table Control
- MADN/EKTS Call Appearance Call Handling-Queries
- ISDN Parameter Downloading Notification-CM

Description

The Multiple Appearance Directory Number (MADN)/Electronic Key Telephone Service (EKTS) CACH feature adds a new call arrangement to ISDN Basic Rate Interface (BRI), Meridian Digital Centrex (MDC), and Residential Enhanced Services (RES) lines in a MADN group. This feature provides for up to 16 call appearances (CA) for each MADN CACH DN. Each CA can have up to 32 members. Each member is referred to as a terminal call appearance (TCA). The maximum number of appearances for each DN is 512 (16 CAs x 32 members for each CA).

Since a MADN CACH DN can map to a maximum of 512 line indexes, a further refinement of the primary member concept is needed. The primary member of the primary CA group is the CACH controller. The controller identifies the line index that allows interacting services a single point of contact for data access for the entire MADN CACH DN. The CACH controller concept is specific to MADN CACH.

The CACH controller designation does not have any bearing on channel allocation and supervision. This concept is illustrated in the following figure by the dashed line around the terminal that contains the primary member of CA 1.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Refer to the feature description “Extension Bridging (EXB)" in the RES volume of this document for information on the EXB call arrangement for RES lines.

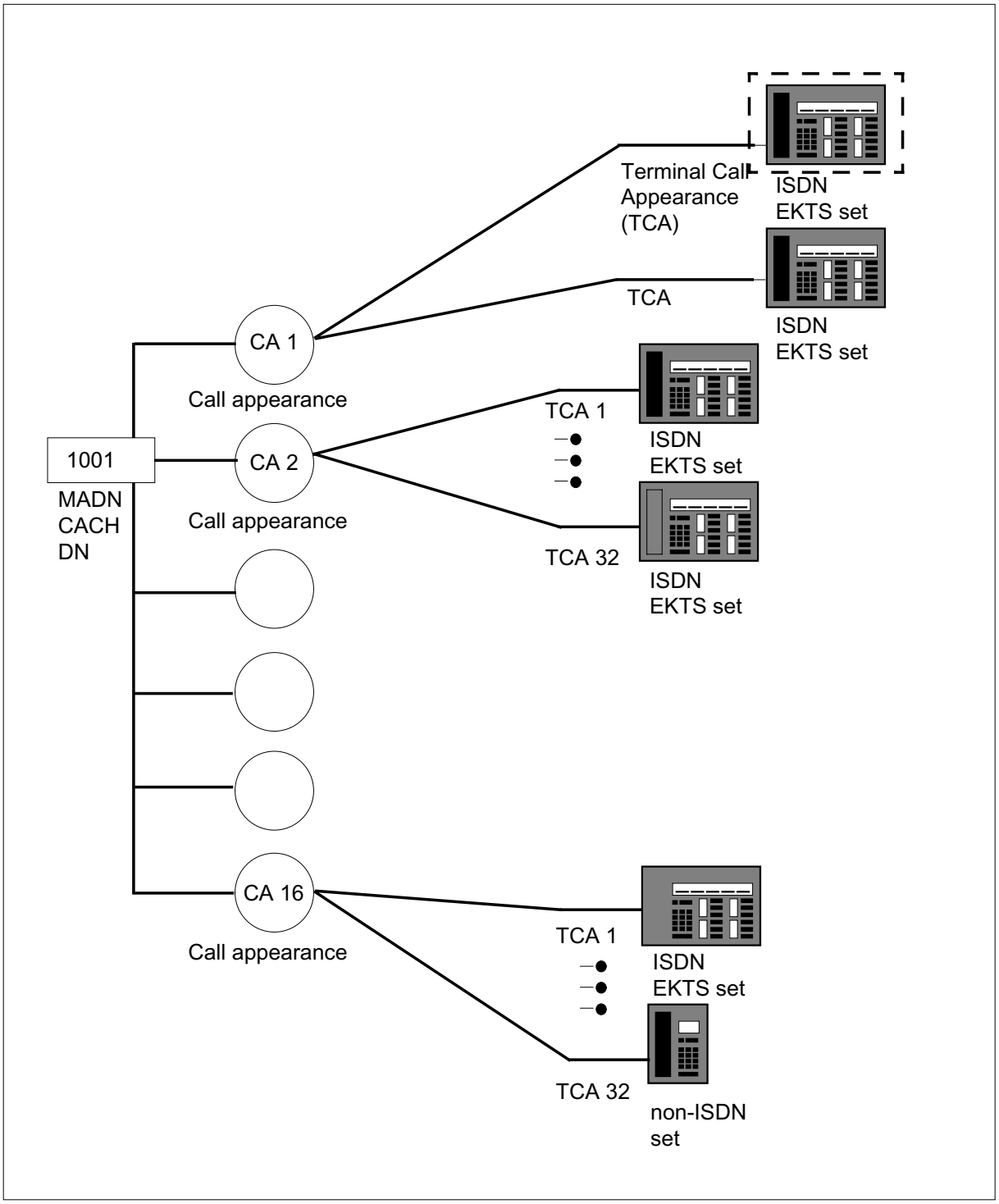
Refer to the feature description “MBS MADN SCA/MCA (across Switch)" in the MDC volume of this document for information on the single call arrangement and multiple call arrangement for MDC lines.

Refer to the feature description “Enhanced MADN Call Control" in the MDC volume of this document for information on SCA for both RES and MDC.

Refer to the feature description “RES Members in a MADN SCA" for information on RES, ISDN, and MDC lines in an SCA group.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

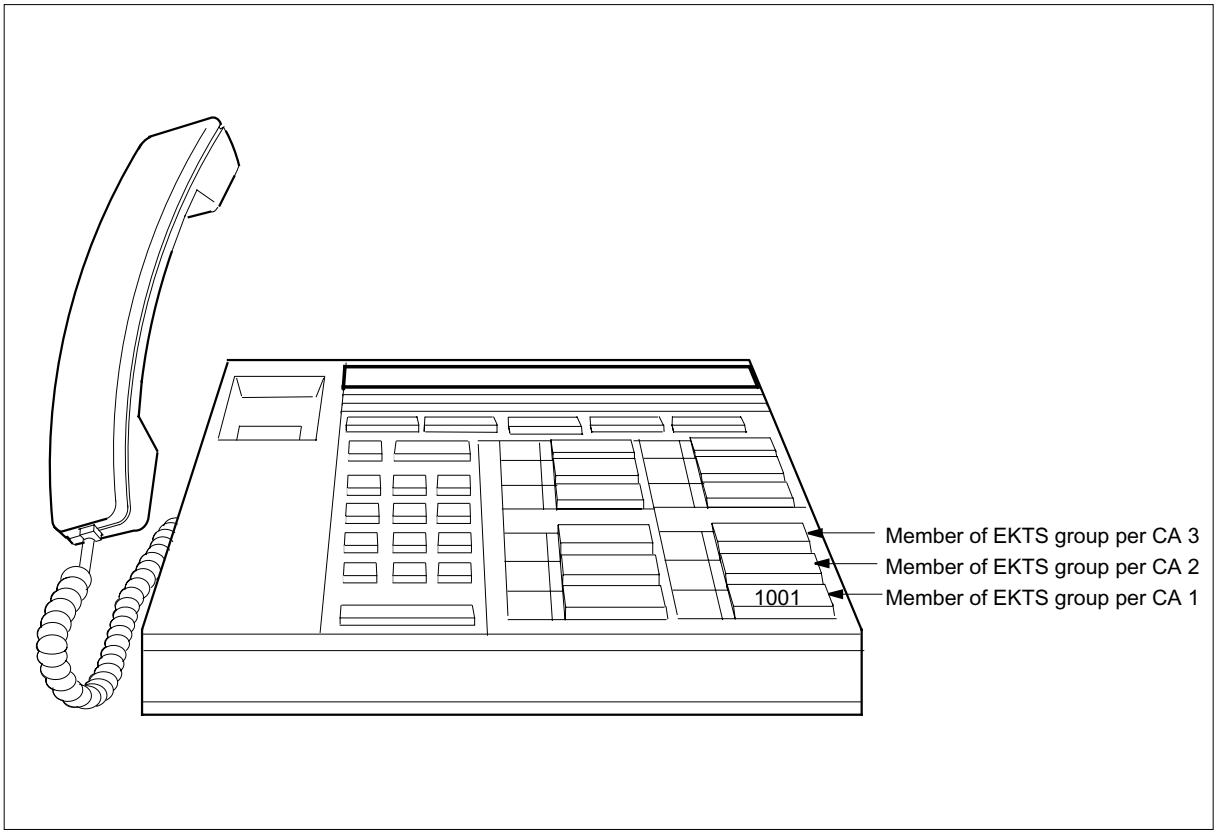
Example ISDN EKTS CACH terminals-relationship of DN, CA, and TCA



MADN/EKTS Call Appearance Call Handling (CACH) (continued)

The following figure illustrates the key appearances of CAs. In this example, the keys have been assigned CA 1, CA 2, and CA 3 for DN 1001.

Example of an ISDN EKTS CACH terminal with CA member key assignments



When one CA of a MADN CACH DN is busy, the idle CAs of the same MADN CACH DN can originate and receive calls. Calls terminating to a MADN CACH DN are offered to the first available CA depending on the CA search order. The default search order is a sequential search 1-16. The search order can be changed through SERVORD.

Operation

Call origination

As shown in the following figure, the DMS switch expects to receive a call appearance information element in a SETUP message sent by any ISDN CACH terminal. This information element (IE) takes the place of the usual calling party number (CGN) IE typically included in the SETUP message from a MADN SCA member. If a CACH member originates a call and the SETUP includes both a call appearance (CA) IE and a CGN IE, the DMS switch ignores the calling party number information.

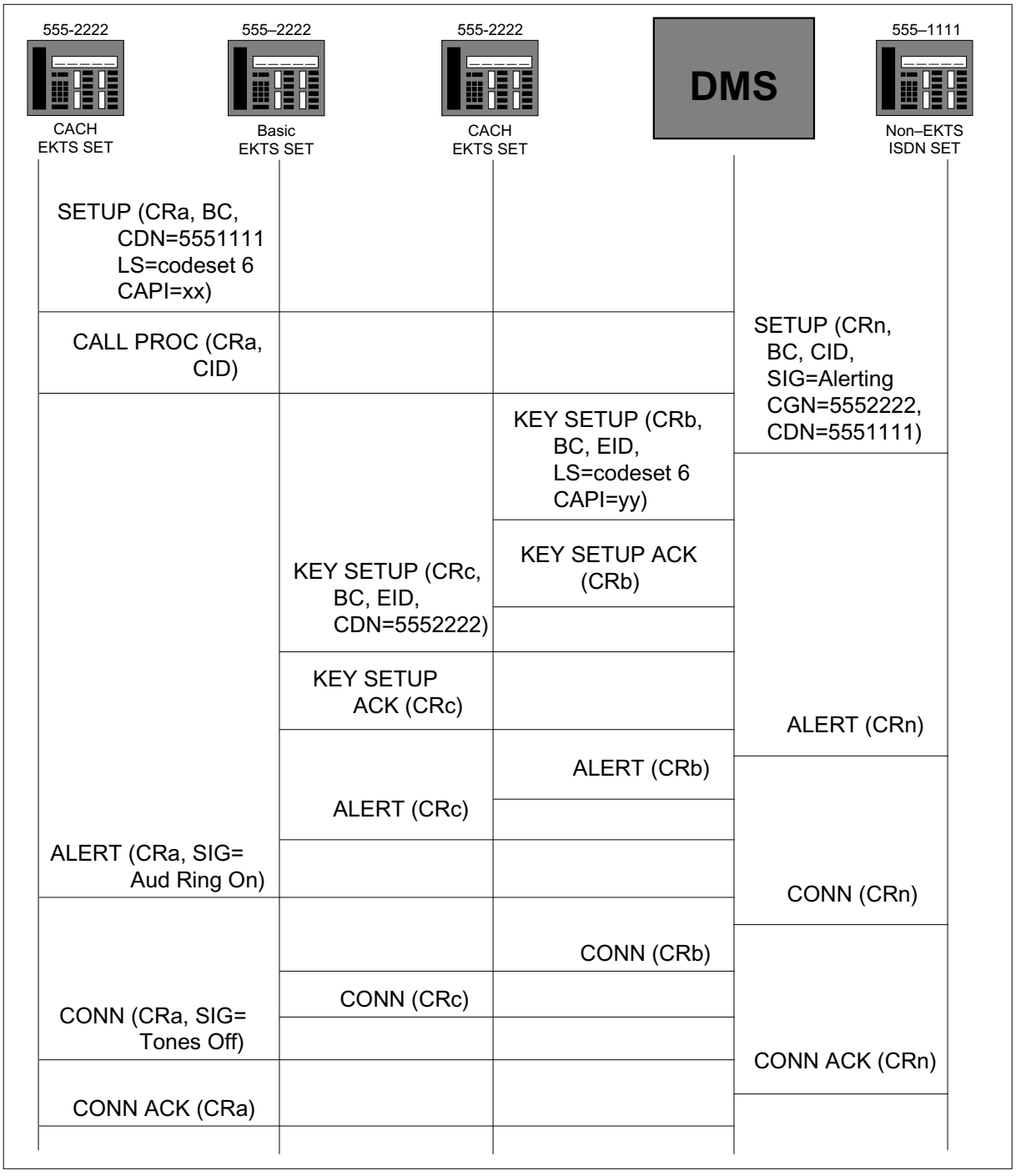
MADN/EKTS Call Appearance Call Handling (CACH) (continued)

When a member of a CACH group originates a call, the DMS switch sends KEY SETUP messages to each of the ISDN members in the originating member's CA group. Each of these messages is encoded differently, depending on whether the member of the CA group is a CACH EKTS terminal or a basic EKTS terminal.

- If the non-originating member is a basic EKTS terminal, the KEY SETUP contains a CDN IE that includes the DN of the originating CACH DN.
- If the non-originating member is a CACH terminal, the KEY SETUP contains a locking shift (LS) IE and a CA IE that specifies the call appearance identifier (CAPI) associated with the selected (originating) CA. These two IEs take the place of the CDN IE that is sent to a basic EKTS terminal.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Example of a call origination from a CACH call appearance



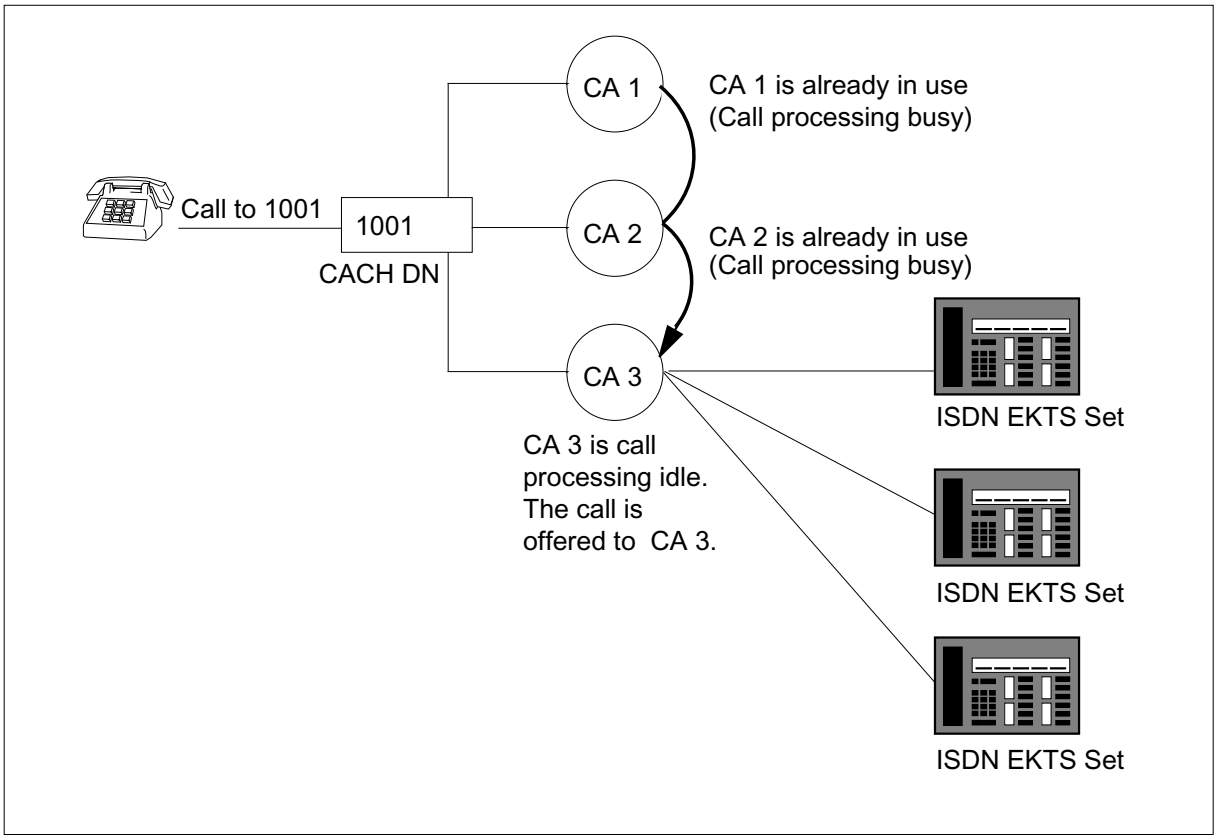
MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Terminating call

On terminating calls to a MADN CACH DN, an idle CA must be selected. The CAs are contained in an ordered list that can be sequential or non-sequential. The objective of the call offering procedures is to find the first idle CA (available to an incoming call) in the list.

For example, if a call terminates on MADN CACH DN 1001, the call process determines which CA is available to take the incoming call. A search takes place in which the CA list is searched for an idle CA. When an idle CA is found, the call is offered to the members of that CA (EKTS group). Refer to the following figure where CA 1 and CA 2 are shown as call processing busy and the call is offered to CA 3.

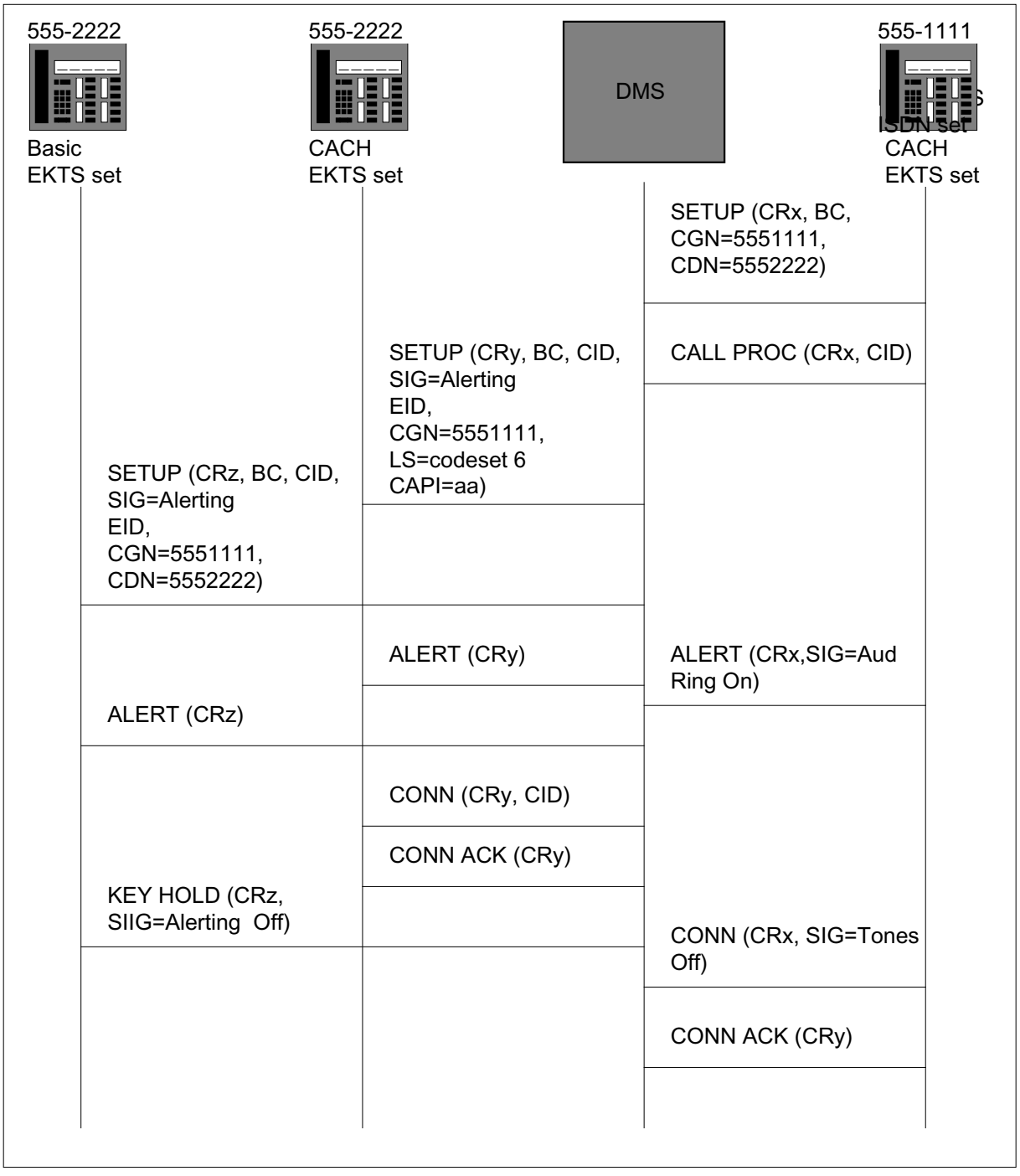
Example of a terminating CACH call-CA1 and CA 2 are call processing busy



The following figure shows an example of termination to an idle MADN CACH CA.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Example of termination to an idle CACH call appearance



MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Call Appearance Reservation

The Call Appearance Reservation (CARES) feature for MADN CACH only involves origination or termination of an EKTS call; it is not involved during an active call or during releasing a call.

The CARES capability consists of four types:

- non-reserved call appearance
  - — The operating company can designate CAs exclusively as non-reserved. All the CAs initially are non-reserved, which means that they are all available for selection during EKTS origination or termination. The operating company personnel can also change the reservation type to NULL (non-reserved). The non-reserved CAs are always searched first for both origination and termination.
- originating only call appearance
  - — The operating company can designate CAs exclusively for originating calls. The switch does not offer a terminating call on such CAs.
- terminating only call appearance
  - — The operating company can designate CAs exclusively for terminating calls. The switch does not allow the user to originate a call on such CAs. Terminating calls are offered to a non-reserved CAs before selecting a terminating only CA.
- originating and priority incoming only call appearance
  - — The operating company can designate CAs exclusively for originating and priority incoming calls. Currently a priority incoming call is defined as one that originates from outside the customer group.

    A priority incoming call must be offered to a non-reserved CA first. If unavailable, a terminating only CA (if available) is selected next. If unavailable too, the switch then chooses an originating and priority incoming only CA.

The CARES feature is associated with call appearances for an entire CA group; therefore, it is not possible to support this functionality without MADN CACH. Also, CARES capability for EKTS only involves origination or termination of an EKTS call; it is not involved during an active call or during the release of a call.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

During origination, if the terminal supports one of the virtual key applications, for example, Automatic Call Appearance Selection, then the switch selects an appropriate CA in the following order:

1. non-reserved CA
2. originating only CA
3. originating and Priority Incoming only CA

During Termination, the switch selects an appropriate CA in the following order:

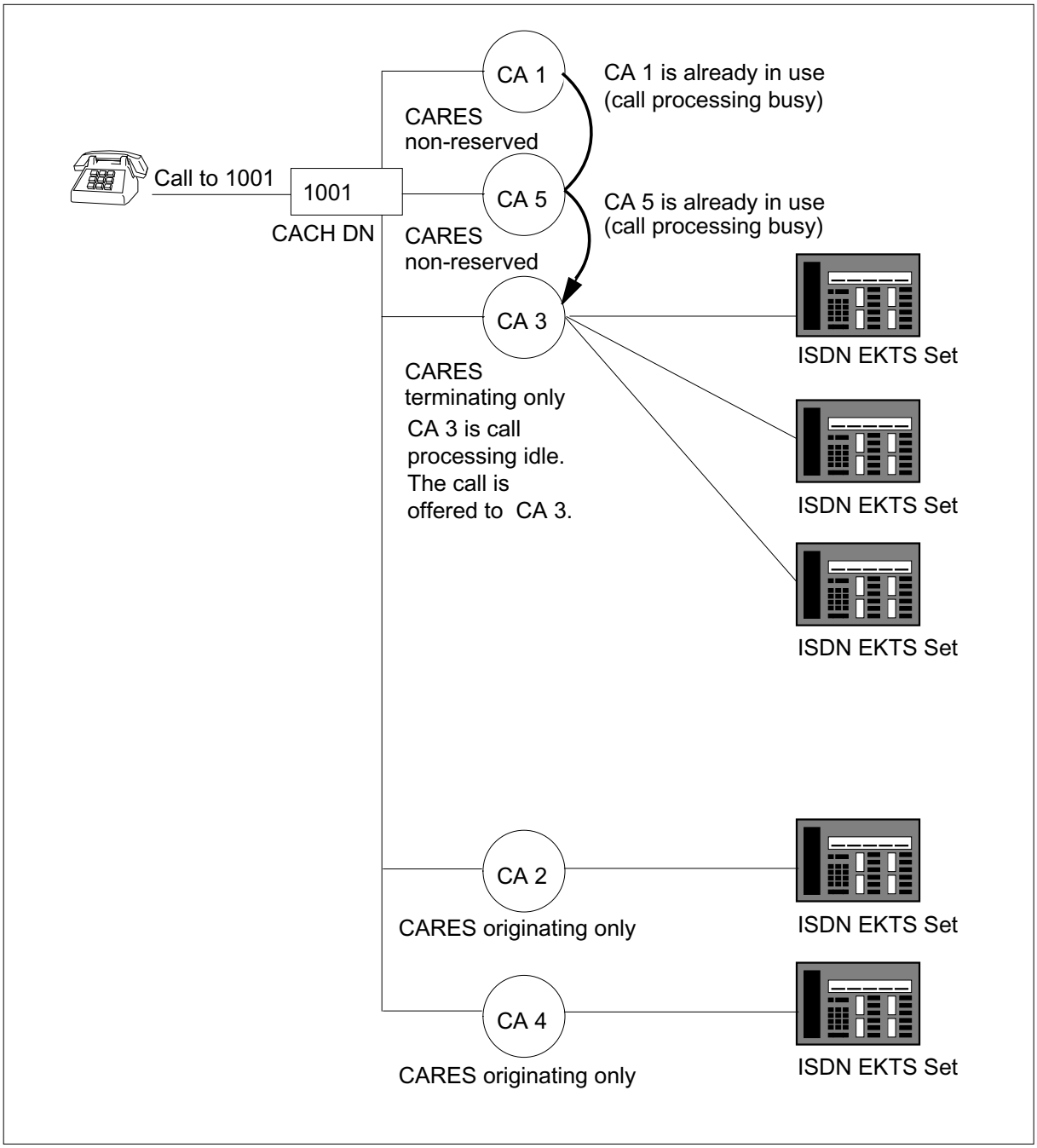
1. non-reserved CA
2. terminating only CA
3. originating and priority incoming only CA

For an incoming call that terminates on an MADN CACH DN, the EKTS call process must try to find an idle non-reserved call appearance on which to terminate. If unavailable, the EKTS call process tries to find a terminating only call appearance to terminate on. If a terminating only call appearance is unavailable, additional checks are made for any available originating and priority incoming only CA. If this call is not a priority incoming call, the call process rejects the call.

The following figure shows how a termination search can look with CARES provisioned against various call appearances. In this example, the call is not offered to CA 2 or CA 4 because these are designated as CARES originating only.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Example of a terminating CACH call-showing CARES types



MADN/EKTS Call Appearance Call Handling (CACH) (continued)

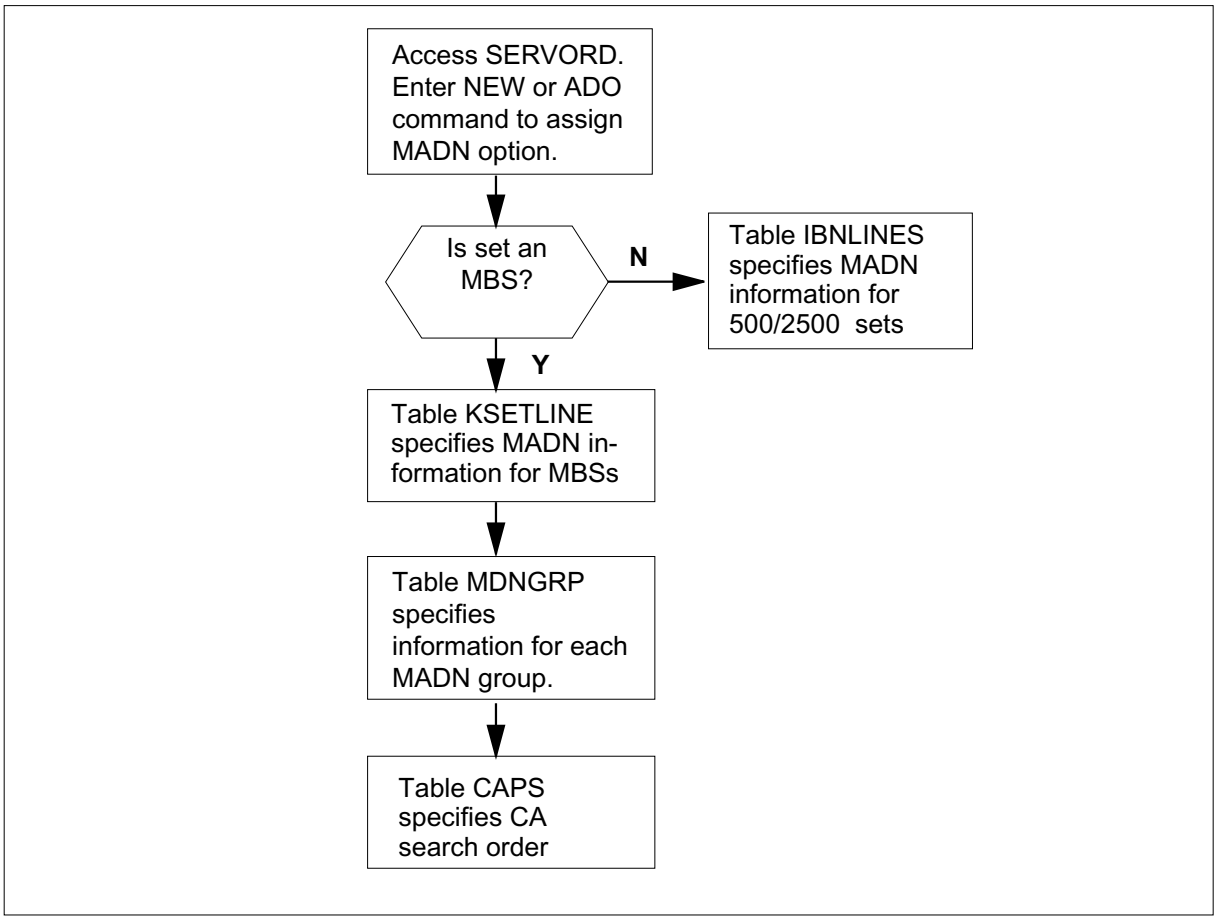
Translations table o w

The MADN/EKTS Call Appearance Call Handling (CACH) translations tables are described in the following list:

- table IBNLINES
- table KSETLINE
- table MDNGRP
- table CAPS

The MADN/EKTS Call Appearance Call Handling (CACH) translation process is shown in the flowchart that follows.

Table o w for MADN/EKTS Call Appearance Call Handling (CACH)



Limitations and restrictions

The following features are incompatible (or blocked) with MADN/EKTS CACH:

- Anonymous Caller Rejection
- Calling Name Delivery
- Call Park
- Call Pickup
- Call Screening, Monitoring, and Intercept
- Call Waiting
- Customer Originated Trace
- Directed Call Park
- Directed Call Pickup with Barge-in (This feature cannot be provisioned on the CACH controller).
- Distinctive Ringing/Call Waiting
- Executive Message Waiting
- Key Short Hunt
- Message Center on EBS Set Message Indication Key
- Message Waiting Indication
- Secondary Member CF Programming
- Selective Call Acceptance
- Selective Call Forwarding
- Selective Call Rejection
- Series Completion
- Spontaneous Call Waiting ID

The following features can be provisioned to the MADN CACH controller only:

- Bulk Calling Line Identification
- Call Forward Busy
- Call Forward Don't Answer
- Call Forward Don't Answer Variable Timer
- Call Forward Universal

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

- Leave Message (only if the primary call appearance CARES type is NULL)
- Message Waiting (only if the primary call appearance CARES type is NULL)

Other restrictions and limitations are as follows:

- Terminations to circuit mode data (CMD) appearances receive treatment when the XPM is in emergency stand-alone mode, unless the CMD is on the same interface (LEN) as the primary member (or CACH controller).
- The progress indicator reports end-to-end ISUP for CMD terminations only. The progress indicator is not supported for MADN VI.
- The CACH option cannot be changed to anything other than SCA by the CHF command.

Interactions

MADN/EKTS Call Appearance Call Handling (CACH) supports the following functionality interactions.

Call forwarding services

The following call forwarding services interact with MADN/EKTS Call Appearance Call Handling (CACH).

From an end user perspective, the call forwarding features work identically for both CACH and MADN SCA DNs. However, from a provisioning perspective, the deployment of these features on a CACH terminal differs from the MADN SCA deployment.

When any of the call forwarding types are provisioned on a MADN SCA DN, the features can only be assigned to the primary member of the MADN SCA group. When provisioned on a CACH MADN, these features can only be assigned to the CACH controller key 1.

Call Forwarding Universal

From an end user perspective, the Call Forwarding Universal (CFU) feature works identically for both CACH and MADN SCA DNs. However, when CFU is provisioned on a MADN SCA, the feature can only be assigned to the primary member of the MADN SCA group. When provisioned on a CACH MADN, CFU and all other types of CFU can only be assigned to the CACH controller. This CACH controller does not have to be the primary DN.

The CFU feature allows a centrex call forward base station to forward calls inside and outside the base station's customer group. The CFU feature can be assigned to either a DN key on a single set or business set (including ISDN

sets), or a feature key on a business or ISDN set. Only the CACH controller can activate, deactivate, and program call forwarding on a station at any time. All other members need to have secondary member CFP to do this.

Call Forwarding Don't Answer

From an end user perspective, the Call Forwarding Don't Answer (CFD) feature works identically for both CACH and MADN SCA DNs. However, when CFD is provisioned on a MADN SCA DN, the feature can only be assigned to the primary member of the MADN SCA group. When provisioned on a CACH MADN, CFD and all other types of CFD can only be assigned to the CACH controller.

Note: The CFD feature can only be assigned to the primary DN on a set.

The CFD feature allows calls to be forwarded after a number of ring cycles have occurred without an answer at the call forwarding (CF) base. Allocation of the feature includes three types of CFD controls:

- N (normal) default
- F (fixed)
- P (programmable)

With CFD N, the call forward state of the CF base is ACTIVE. With CFD F, the initial call forward state is INACTIVE. With CFD P, only the CACH controller can activate, deactivate, and program CFD on a station at any time. The CFD feature can only forward to intragroup destinations.

Call Forwarding Busy

From an end user perspective, the Call Forwarding Busy (CFB) feature works identically for both CACH and MADN SCA DNs. However, from a provisioning perspective, the deployment of this feature on a CACH terminal differs from the MADN SCA deployment.

When CFB is provisioned on a MADN SCA DN, the feature can only be assigned to the primary member of the MADN SCA group. When provisioned on a CACH MADN, CFB and all other types of CFB can only be assigned to the CACH controller.

Note: CFB can only be assigned to the primary DN on a set.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Call Forward Busy (CFB) allows calls to be forwarded when a busy CF base is called. Allocation of the feature includes three types of CFD controls:

- N (normal) default
- F (fixed)
- P (programmable)

With CFB N, the call forward state of the CF base is ACTIVE. With CFB F, the initial the call Forward state is INACTIVE. With CFB P, only the CACH controller can activate, deactivate, and program CFB to different destinations. The CFB feature can only forward to intragroup destinations.

Call Forward on Secondary MADN CACH Members-Dial Access

The CFMDN on MADN CACH feature enhances the existing CFMADN on secondary members. The CFMDN on MADN CACH feature allows users to activate/deactivate call forwarding using dial access procedures through secondary members of a MADN CACH group. A secondary MADN CACH member includes all members of the CACH group excluding the CACH controller. Users can activate/deactivate the CFMDN on MADN CACH feature from any of the call appearances (CA) of the MADN CACH directory number (DN).

CFMDN on MADN CACH controls call forwarding of voice call types for all CAs of a DN. Operating company personnel assign CFMDN to any secondary members of the MADN CACH on sets supported by MADN CACH whether or not the CACH controller is assigned the Call Forwarding feature. CFMDN is not operational until the operating company assigns one of the Call Forwarding Universal (CFU), Call Forwarding Intragroup (CFI), or Call Forwarding per DN per CT (CFXDNCT) features to the CACH controller of the MADN CACH DN.

Operating company personnel assign the CFMDN on MADN CACH feature using the NEW or ADO (add option) commands and delete the CFMDN on MADN CACH feature using the DEO (delete option) command. The operating company personnel can assign the CFMDN on MADN CACH feature to DNs on a DN/logical terminal identifier (LTID) basis on either basic electronic key telephone service (EKTS) or EKTS CACH terminals. On EKTS CACH terminals, the DMS-100 switch supports call forwarding on MADN on all sets on which CACH is supported.

Once the users activate call forwarding on a DN by CFU, CFI, CFXDNCT, or CFMDN, the DMS-100 switch updates the feature indicator lamp for call forwarding on the CACH controller. In addition, the DMS-100 switch notifies

the CACH controller through a reminder ring to remind users that call forwarding is active.

Once any member of the MADN group enters the call forward programming or deactivation state, other users are denied access to activate/deactivate call forwarding until the DMS-100 switch completes processing the first request. After users complete the dial access procedure, they receive a reorder tone. The DMS-100 switch sends ISDN sets cause value #29 stating “facility rejected." This change in call forwarding operation affects all multi-CA programming scenarios that occur with both MADN CACH and MADN multiple call arrangement (MCA).

The CFMDN on MADN CACH feature supports the following digit collection methods:

- single overlap sending
  - — overlap
  - — enblock
- dual overlap sending
  - — overlap followed by enblock
  - — enblock followed by overlap
  - — currently supported methods for IRQ prompting for digits

Conference services

The following conference services interact with MADN/EKTS Call Appearance Call Handling (CACH).

Flexible Calling

Flexible Calling (FC) conferencing can interact with MADN bridging. A MADN group member can MADN bridge into an FC conference. Also, a MADN group member can create an FC conference while MADN bridged. Refer to “MADN/Flexible Calling Interworking for ISDN" in the ISDN section of this document for detailed information.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Three-Way Calling

The introduction of MADN CACH does not change the existing interaction between analog MADN members and Three-Way Calling (3WC). For example:

- A non-ISDN member who shares a CACH MADN can initiate 3WC, regardless of whether or not other members on the MADN are bridged to the call.
- If other MADN members are bridged onto a 3WC, the DMS switch does not process an on-hook signal from the 3WC controller as a transfer request.
- Once an analog member on a CACH MADN initiates 3WC, no other member on the MADN can bridge onto the conference leg associated with the shared DN.

Meet Me Conference

The interaction between EKTS DNs and the Meet Me Conference service is not changed by the CACH feature. When a CACH or MADN SCA member calls the DN associated with a Meet Me Conference, none of the other members who share that MADN can bridge to the Meet Me Conference call.

Preset Conference

The introduction of CACH MADN does not change the existing interaction between the Preset Conference feature and EKTS MADN. When a MADN (CACH or MADN SCA) is part of a preset conference list, only the primary member of the called MADN appearance can answer the call. Secondary ISDN members on the same MADN appearance receive alerting, but requests to answer the call are rejected. In this scenario, secondary Meridian business sets (MBS) that share the called MADN appearance receive lamp updates, but do not ring. Once the call is answered, the secondary ISDN members continue to send alert signaling. This alerting ceases when the secondary member responds to the alerting by going off-hook and bridging onto the answered preset conference call or the preset conference call is cleared.

Emergency services

The following emergency services interact with MADN/EKTS Call Appearance Call Handling (CACH).

E911 calls routed via ES trunks, ES lines, and E911 VFGs

A CACH MADN member that originates an emergency (for example, 911) call over one of the following facilities is subject to the same 911 functionality as

a MADN SCA member. No MADN members (whether CACH or MADN SCA) can hold or bridge onto an emergency call that is routed:

- over an emergency service (ES) trunk
- to an ES line
- through an E911 virtual facility group (VFG)

E911 calls routed over OP trunks

Regardless of whether an emergency call was originated by a CACH or MADN SCA member, the DMS switch always provides identical handling of E911 calls routed over operator (OP) termhold trunks. When the switch processes such calls, the DMS switch permits other members who share the calling EKTS MADN (whether CACH or MADN SCA) to bridge onto the E911 call.

Ringback and the application of receiver off-hook (ROH) tone may not work properly in the case of a bridged MADN call to an E911 agent. Although E911 calls can be routed over OP termhold trunks, Nortel's stated position is that E911 traffic should not be routed over OP trunks. There are two reasons for this position: ringback and ROH work correctly when E911 traffic is routed over ES trunks or through E911 VFGs, and any change Nortel makes to OP trunk behavior (for example, blocking MADN bridging) also impacts calls routed to the Traffic Operator Position System (TOPS).

EKTS services

The following EKTS services interact with MADN/EKTS Call Appearance Call Handling (CACH).

MADN EKTS and CMD options

The MADN EKTS and CMD options can be assigned to the same DN on the same LTID. If the MADN group has the CACH option, the CMD appearances are restricted to one NI-2 member of the group. Terminations to the CMD appearances are allowed in the ESA mode only if the appearances are datafilled on the same LEN as the primary member. The additional call offering unrestricted (ACOU) terminal option, which is incompatible with EKTS LTIDs, does not allow CMD termination. CMD terminations on an EKTS LTID are not offered regardless of B-channel availability.

Bridging

The EKTS Bridging feature works the same for all EKTS MADN call arrangements, regardless of whether they are CACH or MADN SCA DNs. For MADN CACH, Bridging is configured for each call appearance group.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Privacy

The EKTS Privacy feature works the same for all EKTS MADN call arrangements, regardless of whether they are CACH or non-CACH DNs. For MADN CACH, Privacy is configured for each call appearance group.

The Bridged Call Exclusion option (referred to as privacy) can be used to restrict members from bridging into a call. If the feature is enabled on a call, bridging is not allowed. Conversely, if disabled (released on a call), bridging is allowed.

Two versions of this option are available:

- Automatic Bridged Call Exclusion
- Manual Bridged Call Exclusion

The following statements apply to each version:

- Only one Bridged Call Exclusion version can be assigned for each MADN group.
- For every call, every member is notified of the initial privacy status of the call.
- The privacy status of a call can be changed by an active member only.
- A member who changes the privacy status of a call is referred to as the privacy status controller. A member ceases to be the privacy status controller when the initial privacy status of the call is restored.
- Notification is given to each member when the privacy status of the call changes.
- The privacy status of a call can be changed as many times as desired during the lifetime of a call.
- Only one member can control the privacy status of a call at one time.
- The privacy status of a call cannot be changed if the remote party has disconnected from the call or if the MADN conference size has reached its limit.
- Both the Automatic Bridged Call Exclusion and the Manual Bridged Call Exclusion can currently be datafilled on the same terminal since the terminal can have more than one MADN DN with different initial privacy states.

Only one privacy (PRV) and one privacy release (PRL) key can be assigned to an EKTS terminal, and these keys are used to individually set the privacy status for all MADN CACH and MADN SCA DNs subscribed to that terminal. If an EKTS member presses the PRV or PRL key while the terminal is engaged in

two or more simultaneous calls on separate MADN keys, the privacy activation or deactivation request only applies to the active call on the terminal. If a privacy activation or deactivation request contains the call reference of a held call, the request is ignored.

EKTS Hold and MADN Hold

The EKTS Hold and MADN Hold feature works the same for all EKTS MADN call arrangements, regardless of whether they are CACH or non-CACH DNs. For MADN CACH, EKTS Hold and MADN Hold are configured for each DN.

Hold is a feature that allows a user to disconnect from an active call without clearing that call or interrupting the billing process. The user who initiates hold on an active call can reconnect to the call any time by means of the Retrieve feature.

Two hold operation modes are available for MADN. Each operation mode interacts with Bridged Call Exclusion differently. The operation modes are as follows:

- MADN (default)—This mode is identical to the MDC MADN SCA Hold feature.
- EKTS—This mode parallels the EKTS Hold functionality specified by Bellcore.

MADN Hold

The following MADN Hold services interact with MADN/EKTS Call Appearance Call Handling (CACH):

- non-bridged calls
  - — If a member initiates hold on a non-bridged call, each member receives notification indicating that the call is held. Any member receiving a call from MADN hold restores the initial privacy status of the call and a privacy status update is sent to each member.
- bridged calls
  - — If a member initiates hold on a bridged call, only that member's portion of the call becomes held. The remaining connection(s) are retained.
  - — A held portion of a bridged call can be retrieved only by the holding member.
  - — Hold events on bridged calls do not affect the current privacy status nor subsequent bridging attempts and privacy status changes.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

EKTS Hold

The following EKTS hold services interact with MADN/EKTS Call Appearance Call Handling (CACH):

- non-bridged and non-private calls
  - — If a member initiates hold on a non-bridged and non-private call, every member receives notification indicating that the call is held.
  - — Any member can retrieve the call. If a member retrieves the call, every member receives notification indicating that the call has been retrieved. If the retrieving member is not the holding member, the initial privacy status was private, and the holding member had activated privacy release prior to hold, the network enables privacy and notifies each member of the privacy status change. In this case, the member who originally held the call ceases to be the privacy status controller of the call. If the retrieving member is the holding member and the holding member had activated privacy release prior to hold, no privacy status change occurs.
  - — If the network is unable to provide to each associated member notification indicating that the call is held, only the holding member is permitted to retrieve the held call. In this case, the current privacy status of the call is not affected by hold and retrieve events.
- non-bridged and private calls
  - — If a member initiates hold on a non-bridged and private call, no member receives notification indicating that the call is held.
  - — Only the holding member is permitted to retrieve the held call.
  - — The current privacy status of the call is not affected by hold and retrieve events under these circumstances.
- bridged calls
  - — If a member initiates hold on a bridged call, only that member's portion of the call becomes held. The remaining connection(s) are retained.
  - — A held portion of a bridged call can be retrieved only by the holding member (regardless of the current privacy status).
  - — Hold events on bridged calls do not affect the current privacy status nor affect subsequent bridging attempts and privacy status changes.

MADN Ring Forward

The MADN Ring Forward (MRF) feature, also known as EKTS Abbreviated and Delayed Ringing (ADR), works the same for all EKTS MADN call arrangements, regardless of whether they are CACH or non-CACH DNs. For MADN CACH, MRF or ADR are configured for each DN.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

When MRF is assigned to a MADN group, the following ring alerting options can be assigned to the individual appearances of the MADN:

- ALWAYS—The MADN appearance rings from the time the call completes to the MADN group until it is answered or abandoned.
- NEVER—Calls completing on the MADN group never cause ring alerting for this appearance of the MADN.
- ABBReviated—The MADN appearance rings from the time the call completes on the MADN group until it is answered or abandoned, or until MRF takes effect either automatically or manually.
- DELAYed—The MADN appearance begins ringing when MRF takes effect on the incoming call.

MRF can be activated either 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.

When assigning a MADN ring forward manual (MRFM) key to a user's terminal, SERVORD prompts for a keylist. The ringing pattern for all the CACH and MADN SCA DNs in this keylist changes (for example, from abbreviated to delayed) when the associated MRFM key is pressed. More than one manual MRFM key can be added to an EKTS terminal. Potentially, each MADN could be controlled by its own MRFM key. Similarly, SERVORD also allows a single MRFM key to control a number of MADN DN keys.

Intercom services

A member can retrieve a Group Intercom call onto a conference on a DN call appearance if

- EKTS bridging is active on the directory number call appearance
- no other user on the call appearance has DN bridging active

A member can create an FC conference on an ICM call, and a member can bridge into an established FC conference.

Message waiting services

The following message waiting services interact with MADN/EKTS Call Appearance Call Handling (CACH).

Message Waiting

From an end user perspective, the Message Waiting (MWT) and Leave Message (LVM) features work identically for both CACH and MADN SCA DNs. However, when MWT and LVM are provisioned on a MADN SCA DN,

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

the features can only be assigned to the primary member of the MADN SCA group. When provisioned on a CACH MADN, these features can only be assigned to the CACH controller.

Both CACH and MADN SCA DNs are subject to the following restrictions when assigned MWT or LVM:

- Message Waiting (and its Call Return (CAR) subfeature) only apply to calls routed to and from the primary DN (key 1) on the EKTS terminal.
- If a MADN member is assigned an MWT key with the CAR subfeature, the user can go off-hook and press the MWT key in response to an MWT indication (a lit MWT lamp). When the MWT lamp is illuminated as a result of an LVM request and the MADN member presses the MWT key, the DMS switch initiates CAR and automatically attempts to recall the party who initiated LVM. When the MADN member uses Simplified Message Desk Interface (SMDI) for voicemail and the MWT lamp is lit due to a waiting message, the MADN member can automatically dial into the message center by pressing the MWT key.
- The LVM feature can only be initiated on outgoing calls from the primary DN on a terminal.
- The LVM feature can only be initiated on a terminal that supports MWT.

Name and number services

There are different types of calling name and number services that can be assigned to a DN, DN key, customer group, or the office. These services are divided into two categories described as follows:

- services that suppress or allow delivery of the calling party's name and number
- services that prevent or allow the delivery of the calling party's name and number to the called party

Interaction of calling name and number services with the ISDN member

The following describes calling name and number services that apply to the ISDN member.

Block Calling Number

The Block Calling Number (Block CGN) feature interaction affects the terminating call process. Block CGN is an existing DMS-100 ISDN service. This service is assigned to the terminating party.

The default behavior for ISDN is to deliver both the originator's name and calling number to the called user during call termination. However, by using

the Block CGN feature the originator's calling number (CGN) can be withheld from delivery to the terminating user.

This option is datafilled (activated) through SERVORD on an LTID-key (member) basis for MADN SCA or MADN CACH. Only this member has CGN blocking on. All of the other applicable members of the MADN group receive the originator's CGN during call termination.

The interaction between Block Calling Number and ISDN EKTS DNs is not changed by the CACH feature.

Calling Number Delivery

The Calling Number Delivery (CND) feature controls the delivery of the originator's number to the called user during call termination. If CND is active, the number is delivered. If CND is inactive, the number delivery is suppressed.

This option is datafilled through SERVORD on an LTID-key basis. This feature can also be activated by feature key or access code. If the feature is datafilled through SERVORD, delivery occurs for every call. If the feature key or access code is used to activate the feature, delivery occurs until the user turns the service off by feature key or access code.

For MADN SCA and MADN CACH, activation causes only one member to have CND on. All of the other members of the MADN group continue to have CGN delivery suppressed during call termination.

Calling Name Delivery

Calling Name Delivery (CNAMD) is incompatible with MADN SCA and CACH.

Caller ID Delivery and Suppression Suppression

Calling Name and Number Blocking was developed for residential enhanced services (RES) and Meridian Digital Centrex (MDC) lines. The feature allows the originating subscribers to control the availability of their DN for display to the terminal equipment of terminating subscribers on each call. Calling Name/Number Delivery (CNND) is the functional opposite of CNNB, setting the DN and name presentation statuses to allowed, regardless of the default value, on each call.

For ISDN BRI, the functional equivalent of CNNB is Caller ID Delivery and Suppression Suppression (CIDSSUP). CIDSSUP enables the subscriber to block the delivery of one's name or number or both on each call. The CIDSSUP feature can be provisioned on an ISDN terminal through SERVORD. The option can be added to DN option key 1 (primary DN on a terminal) or to a feature key, which can be assigned to a subset of DN keys on

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

the terminal. As the subscription to this service is on an LTID or key basis, this service is assigned and activated on a member basis for a MADN SCA and MADN CACH group.

Caller ID Delivery and Suppression Delivery

For ISDN BRI, the functional equivalent of CNND is Caller ID Delivery and Suppression Delivery (CIDSDLV). The CIDSDLV feature can be assigned to ISDN BRI sets on either the primary directory number (PDN) key or on a feature key and is applicable to a selected set of DNs on the set. Once this option is provisioned and activated by the existing IBNXLA activation code CIDSDLV or by a feature key, this feature delivers the subscriber's name and number for a given call. Because the subscription to this service is on an LTID or key basis, this service is assigned and activated on a member basis for a MADN SCA and MADN CACH group.

MADN group name

Currently, the MADN group name is provisioned against the DN. For calls originating from or terminating to a MADN group, the MADN group name is used on the other party's display. The interaction between MADN group name and ISDN EKTS DNs is not changed by the CACH feature.

MADN member name

The interaction between MADN member name and ISDN EKTS terminals is not changed by the CACH feature.

A name can be datafilled through service orders or table control for each member of a MADN group. The identity of all MADN members can be associated with two names: a MADN group name and a MADN member name. If a member name is not datafilled, the group name is used (if datafilled). The primary MADN member is treated like any other member with respect to the datafill and use of a personal name. On calls originated by a MADN member, the member name is given on the terminating party's display (if applicable). On calls terminating on a MADN member, the group name is given to the originating party's display before answer; the member name, after answer.

This option is datafilled (activated) through SERVORD on an LTID-key (member) basis for MADN SCA or MADN CACH. A terminal that is datafilled with multiple appearances of a CACH DN, has multiple name entries for that CACH DN (one for each CA in which the terminal has a member). The operating company personnel can make each name match or make each name different.

Interaction of calling name and number services with the MBS member

Any primary or secondary member provisioned on a Meridian business set is delivered if the calling name and number services are turned on for the customer group that the member belongs to. A primary or secondary member being a member of a CACH call appearance does not affect the interaction with calling name or number services.

Interaction of calling name and number services with the IBN line member

Calling name and number services that affect the calling and called parties are provisioned to a DN and LEN combination for a MADN member whose LCC type is IBN. The services are provisioned to a member, whether the member belongs to a MADN SCA group or a MADN CACH group.

The calling name and number services currently interact with MADN SCA members and they interact in a similar manner with MADN CACH group members.

Recall services

The following recall services interact with MADN/EKTS Call Appearance Call Handling (CACH).

Ring Again

The Ring Again (RAG) feature is an intraswitch DMS feature.

The Ring Again feature allows a user encountering a busy destination the option of being notified when the busy number becomes idle. This feature is valid only if the originating and terminating parties are served by the same DMS-100 switch and belong to the same customer group.

The interaction between Ring Again and MADN CACH when a MADN CACH member originates a call and activates RAG is not changed by the MADN CACH feature. However, the MADN CACH feature does change the interaction between Ring Again and MADN CACH when a call terminates on a MADN CACH group with all CA groups (which accept terminating calls) busy, and the calling party activates RAG. When one of the CA groups becomes idle, as the recall occurs, the call is re-offered to the MADN CACH group. This call is subject to the idle CA search. Like the initial call, the initiator of RAG has no control over which CA gets the call.

Network Ring Again

Network Ring Again (NRAG) allows the Ring Again feature to work when the calling and called parties are on different switches connected by PRI trunks or by a combination of PRI and CCS7 links. An end user located in any of the

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

switching nodes in the combined PRI/CCS7 network can apply NRAG against a busy station located in any of the nodes in the same network and customer group. The Ring Again feature allows an end user who calls a busy station to queue against that station and be recalled when it becomes idle.

The NRAG feature supports four types of network transports: PRA, SS7, DPNSS virtual call, and BTUP.

- The NRAG feature supports MADN for PRA and SS7.
- The NRAG feature does not support MADN for DPNSS. This pre-existing restriction applies to all types of MADN call arrangements. Any MADN members attempting to RAG across a network are blocked by the call process.
- The NRAG feature supports MADN for BTUP.

The interaction between MADN CACH and NRAG is similar to MADN CACH and RAG.

Call Back Queueing

Call Back Queueing (CBQ) allows a station user encountering an all trunks busy condition to request notification when a trunk becomes idle and automatically access the same number using the Call Back Queue feature. The CBQ feature is an extension of the Ring Again feature.

The interaction between MADN and CBQ is not changed by the MADN CACH feature.

Automatic Call Back

The Automatic Call Back (ACB) feature allows a subscriber to place a call to the last station called by the user. If the called station is busy, the subscriber can queue a call back request against that station and be recalled when the station becomes idle. The CLASS service ACB can be provisioned for IBN sets, Meridian business sets (MBS), and residential lines. The ISDN service ACB functions like the CLASS service, but for ISDN sets.

Any member of a MADN SCA or CACH group can initiate ISDN ACB if the called DN is busy. When the called DN or CA becomes idle, the member of the MADN SCA or CACH group that initiated ACB is notified and automatic call establishment occurs.

Automatic Recall

The Automatic Recall (AR) feature allows a subscriber to place a call to the last station that called the user. If that station is busy, the user can queue a call back request against that station and be recalled when the station becomes idle.

The CLASS service AR can be provisioned for IBN sets, Meridian business sets (MBS), and residential lines.

The ISDN service AR functions like the CLASS service, but for ISDN sets. ISDN AR works like ISDN ACB; however, AR requires you to provision a primary member within a CA for MADN SCA or CACH members.

Speed call services

The following speed call services interact with MADN/EKTS Call Appearance Call Handling (CACH).

The speed call services work the same for all terminals in a CACH group, regardless of whether they are CACH or non-CACH terminals. The interaction between MADN CACH terminals and the following speed call features is not changed by the MADN CACH feature.

Speed Call Short

Speed Call Short (SCS) list allows an end user to store up to ten frequently dialed DNs in a list so that they are outpulsed automatically by dialing a single-digit code. This is done by dialing the speed call short list feature access code, which consists of an asterisk plus a single-digit code (0-9), instead of dialing all the digits of the desired DN. After adding SCS to the set, any DN that is in the SCS list can access this list. Moreover, because SCS is a terminal-based feature, all DNs on that set have access to the SCS list. The list has one line designated as the controller and only this line can edit the SCS list. However, other members that are on the same set can access the list.

The interaction between terminals in a CACH Group and Speed Call Short is not changed by the MADN CACH feature.

Speed Call Long

Speed Call Long (SCL) list allows an end user to store 30, 50, or 70 of the most frequently dialed DNs in a list so that they are outpulsed automatically by dialing a two-digit code. This is done by dialing the speed call long list feature access code, which consists of an asterisk plus a double-digit code (00-69), instead of dialing all the digits of the desired DN. After adding SCL to the set, this option can be activated by pressing any DN key in the SCL list followed by the pressing the SCL key. Because SCL is a terminal-based feature, all DNs on that set have access to the SCL list. The list has one line designated as the controller and only that line can edit the SCL list. However, other members that are on the same set can access the list.

The interaction between terminals in a CACH group and Speed Call Long is not changed by the MADN CACH feature.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Speed Call Group

Speed Call Group (SCU) is a feature that provides end users the ability to have access to a speed calling long list. They can only use the numbers stored in the long list; they cannot add or change the original list that the primary set has provided. One end user is designated as the controller and has the capability to add or change the list. The controller can be any end user that has a speed calling long list. Users who wish to access the SCL list must have SCU on their sets; these users have DNs in the SCL list that they can use based on the primary set's discretion. Also, because SCU is a terminal-based feature, if SCU is provisioned on a set, then all DNs on that set can use the SCU capability.

The interaction between terminals in a CACH group and speed call group is not changed by the MADN CACH feature.

Terminating Billing Option

Terminating Billing Option (TBO) is a feature that provides the operating company (OC) with the ability to generate an automatic message accounting (AMA) record when a call terminates to a line or through a virtual facility group (VFG) that has the TBO feature assigned. This feature allows the OCs to have an access charge for each termination and to assign up to 200 unique call codes for various plans. The TBO is provided on POTS, MBS, RES, IBN, and ISDN sets. The TBO gives the OC a way to charge the terminating party for a call. Originations from all CAs is supported, but terminating calls are offered only to the CACH controller.

The TBO is only assignable (using SERVORD) to the primary member of a MADN SCA group and is provisioned on a DN-basis. With MADN CACH, TBO can only be assigned to the CACH controller.

Emergency stand-alone

Emergency stand-alone is a condition that occurs when the connection between the computing module (CM) and XPM has been broken. Once this happens, the switch is said to be in ESA mode, meaning all of the knowledge that is used to perform call processing, resides in the XPM. Call appearances are supported in ESA mode, but are only limited to one for each call.

With MADN SCA, only the primary member of a group is used for call processing. For MADN CACH, only the CACH controller's call appearance is supported.

Directed Call Pickup

The Directed Call Pickup (DCPU) option allows a station to answer a ringing line within the same customer group before it has been answered by the called party. The Directed Call Pickup Barge-In (DCBI) option gives the subscriber the same capabilities as DCPU. Also, if the called party has answered the call,

the DCBI option allows the subscriber to barge-in to the answered call and be connected as a three-way call.

Directed Call Barge-In (DCBI) and DCPU on a CACH DN is not allowed.

Executive Busy Override

The Executive Busy Override (EBO) option allows a station user to gain access to a busy station by flashing the switch-hook during busy tone and then dialing an access code. On business sets, EBO is activated by pressing the EBO key. The calling station thereby establishes a three-way conference with the busy station. MADN CACH members can initiate EBO if EBO is assigned to their sets.

Using EBO on a MADN CACH call is not allowed.

Activation/deactivation by the end user

MADN/EKTS Call Appearance Call Handling (CACH) requires no activation or deactivation by the end user.

Billing

MADN/EKTS Call Appearance Call Handling (CACH) does not affect billing.

Station Message Detail Recording

MADN/EKTS Call Appearance Call Handling (CACH) does not affect Station Message Detail Recording.

Data lling of ce parameter s

MADN/EKTS Call Appearance Call Handling (CACH) does not affect office parameters.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Data ll sequence

The following table lists the tables that require datafill to implement MADN/EKTS Call Appearance Call Handling (CACH). The tables are listed in the order in which they are to be datafilled.

Data ll tab les required for MADN/EKTS Call Appearance Call Handling (CACH)

Table	Purpose of table
KSETLINE	Key set line contains the DN appearances for business sets and data units. One entry is required for each DN related key on a business set and data unit.
IBNLINES	Integrated business network (IBN) lines contains the assignments for each 500 or 2500 set assigned as an IBN or residential enhanced services (RES) line.
MDNGRP	MADN group contains the information on each member associated with each MADN group.
CAPS	Call appearance sequence determines the order in which CAs are offered calls. The default is CA1-CA16.
Note: These tables are datafilled through SERVORD; therefore, a detailed description of datafill is not included.	

Translation veri cation tools

The figure that follows shows sample TRAVER output for MADN/EKTS Call Appearance Call Handling (CACH).

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

TRAVER output example for MADN/EKTS Call Appearance Call Handling (CACH)

```
traver l 6215920 6215901 b
TABLE KSETLINE
ISDN 1 3 MDN SCA 0 Y Y 6215920 IBNTST 0 0 613 (RAG)(PRK)(SFC)(CFX)$
   BRI UNDEF N $
TABLE DNATTRS
613 621 5920
   (PUBLIC(NONUNIQUE)$)$$
TABLE DNGRPS
TUPLE NOT FOUND
TABLE KSETFEAT
TUPLE NOT FOUND
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP LNPOFFICE
AIN Orig Attempt TDP: no subscribed trigger.
TABLE NCOS
IBNTST 0 0 0 TST10 (XLAS CXT1 RXCFN NDGT) (OHQ 0 TONE_OHQ) (CBQ 0 1 Y
2) (ERWT) (ACR N)$
TABLE CUSTHEAD: CUSTGRP,PRELIMXLA,CUSTXLA,FEATXLA,VACTRMT,AND DIGCOL
IBNTST NXLA CXT3 RXCFN 0 TST1
TABLE DIGCOL
TST1 6 COL S 2
TABLE IBNXLA:XLANAME CXT1
CXT1 62 NET Y  Y 1 N NDGT N N GEN (LATTR 0 613_P621_0 L613_LATA1_0)$$
TABLE DIGCOL
NDGT specified: digits collected individually
TABLE LINEATTR
0 1FR NONE NT 0 10 NILSFC 0 NIL NIL 00 613_P621_0 L613_LATA1_0$
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
613_P621_0 FR01 613 P621 TSPS Y RESGRP 0 2 $$
TABLE RATEAREA
L613_LATA1_0 L613 NIL LATA1 $
```

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

TRAVER output example for MADN/EKTS Call Appearance Call Handling (CACH) (continued)

```
TABLE STDPRTCT
P621 (1)(0)1
   .SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING. CALL TYPE
DEFAULT IS NP. PLEASE REFER TO DOCUMENTATION.
   .KEY NOT FOUND
   .DEFAULT VALUE IS: N NP 0 NA
   .SUBTABLE AMAPRT
   .KEY NOT FOUND
   .DEFAULT VALUE IS: NONE OVRNONE N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
613 Y 917 2 (53)(1)(0)(0)2$
   .SUBTABLE HNPACODE
   .KEY NOT FOUND
   .REAL VALUE IS: VCT VACT N
TABLE TMTCNTL
LNT (112)
   .SUBTABLE TREAT
   .VACT Y S T120
+++TRAVER:SUCCESSFUL CALL TRACE+++
TREATMENT ROUTES. TREATMENT IS: VACT 1 T120
+++TRAVER:SUCCESSFUL CALL TRACE+++
```

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

SERVORD

SERVORD prompts

The following table shows the SERVORD prompts used to assign, delete, or change MADN/EKTS Call Appearance Call Handling (CACH) on a line.

SERVORD prompts for MADN/EKTS Call Appearance Call Handling (CACH)

Prompt	Valid input	Explanation
CA_NUM	1-16	The number associated with a particular call appearance.
CARES_TYPE	NULL, DTM, DOR, DTMEPI	The following are the four CARES types: • NULL: unassigned • DTM: originating only • DOR: terminating only • DTMEPI: originating and priority incoming only The CARES_TYPE field is prompted only if the NEWCA field is set to Y. The CARES type is associated with the call appearance, not the primary member of the CA.
MDNTYPE	CACH	Indicates the multiple appearance directory number (MADN) call appearance type.
NEWCA	Y, N	If Y is entered, it indicates the creation of a new call appearance group. An N entered indicates the user does not want to create a new call appearance group.
OPTION	MDN	Option(s) associated with a service to be established, modified, or deleted.
OPTKEY	1 to 69	Key associated with the option.
VALID_CA_NUM	Valid CA (1-16)	Indicates an invalid CA number has been entered. Enter a valid CA number.

SERVORD example for adding, changing, and deleting MADN/EKTS Call Appearance Call Handling (CACH)

The following SERVORD examples show how MADN/EKTS Call Appearance Call Handling (CACH) is added, changed, and deleted.

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Example of the NEW command in prompt mode—primary member to an existing CA (existing MADN DN)

```
>NEW
SONUMBER:  NOW 86 07 08 AM
>(CR)
DN_OR_LEN:
>8675309
LCC_ACC:
>ISDNKSET
GROUP:
>IBNTST
SUBGRP:
> 0
NCOS:
> 0
SNPA:
> 613
KEY:
> 2
RINGING:
> Y
LATANAME:
> NILLATA
LTG: 0
> (CR)
LEN_OR_LTID:
> ISDN 35
OPTKEY:
> 2
OPTION:
>MDN
MDNTYPE:
>CACH
PRIMARY:
>Y
NEWCA:
>N
CA_NUM:
> 3
OPTKEY:
> $
```

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Example of the ADO command in no-prompt mode-primary member to an existing CA (existing MADN DN)

```
>NEW  $  8675309  ISDNKSET IBNTST 0 0 613 2 Y NILLATA $ ISDN 35
2 MDN CACH Y N  3  $
```

Example of the ADO command in prompt mode—adding MADN CACH option

```
>ADO
SONUMBER:  NOW 86 07 08 AM
>(CR)
DN_OR_LEN:
>ISDN 2
OPTKEY:
> 1
OPTION:
>MDN
MDNTYPE:
>CACH
PRIMARY:
>Y
NEWCA:
>Y
CARES_TYPE: NULL
> DTM
DIR_NUMBER:8675309
>8675920
OPTION:
>$
```

Example of the ADO command in no-prompt mode—adding MADN CACH option

```
>ADO  $  ISDN 2 1  MDN CACH Y Y DTM  8675920  $
```

MADN/EKTS Call Appearance Call Handling (CACH) (continued)

Example of the CHF command in prompt mode-changing the CARES type on a MADN CACH line

```
>CHF
SONUMBER:  NOW 86 07 08 AM
>(CR)
DN_OR_LEN:
>ISDN 2
OPTKEY:
> 1
OPTION:
>MDN
MDNTYPE:
>CACH
PRIMARY:
> Y
CARESTYPE: DTM
> DTMEPI
DIR_NUMBER: 8675309
>CR
DENIAL TREATMENT:
> SILENCE
BRIDGING:
> Y
CONF_SIZE:
> 3
BRIDGE_TONE:
> Y
INIT_STAT:
NONPRIVATE
OPTION:
$
```

Example of the CHF command in no-prompt mode-changing the CARES type on a MADN CACH line

```
>CHF $ ISDN 2 1  MDN CACH Y  DTMEPI SILENCE Y 3 Y NONPRIVATE $
```

MADN/EKTS Call Appearance Call Handling (CACH) (end)

Example of the DEO command in prompt mode—used to remove the MADN/EKTS CACH option

```
>DEO
SONUMBER:  NOW 90 06 21 AM
>(CR)
DN_OR_LEN:
>ISDN 2
OPTKEY:
> 1
OPTION:
>MDN
DIR_NUMBER: 8675309
>CR
OPTKEY:
> $
```

Example of the DEO command in no-prompt mode—used to remove the MADN/EKTS CACH option

```
>DEO  $  ISDN 2 1  MDN  $
```

NI-1/NI-2 Interface Identi cation

Ordering codes

Functional group ordering code: NI000051

Functionality ordering code: not applicable

Release applicability

NA008 and up

Prerequisites

All the datafill information for this particular functionality is included in this document. However, prerequisite software or hardware may be required for complete implementation.

Description

The NI-1/NI-2 Interface Identification feature introduces National ISDN 2 (NI-2) logical terminal identifiers (LTID), which can support terminals with NI-2 capabilities. This feature provides the following functionality:

- provides support for NI-2 LTIDs
- distinguishes ISDN interfaces containing National ISDN 1 (NI-1) LTIDs from those containing NI-2 LTIDs

  Note: Due to differing capabilities, LTIDs introduced in NA007 or earlier (referred to as NI-1 LTIDs) cannot coexist with NI-2 LTIDs on the same ISDN interface.

- provides the ability to restrict the number of non-initializing terminals (NIT) that can be supported by an NI-2 default LTID

The NI-1/NI-2 Interface Identification feature requires SOC option NI000051 to be activated.

Operation

The NA007 release introduced support for the following LTID functionality:

- LTIDs with 2B-channel capability. Since B-channel contention procedures were not available in NA007, the maximum number of 2B-channel LTIDs allowed on an ISDN interface was limited to one. The NA007 release continued support for 1B-channel LTIDs. All LTIDs supported prior to the NA008 release are NI-1 compliant.

  Note: B-channel contention procedures provide the computing module (CM) with B-channel availability information, allowing it to make a

timely determination of whether or not a B-channel is available for a termination.

- Default LTIDs (LTIDs that are capable of supporting NITs). With the NA007 release, the number of NITs that could be supported on a default LTID was limited to one.

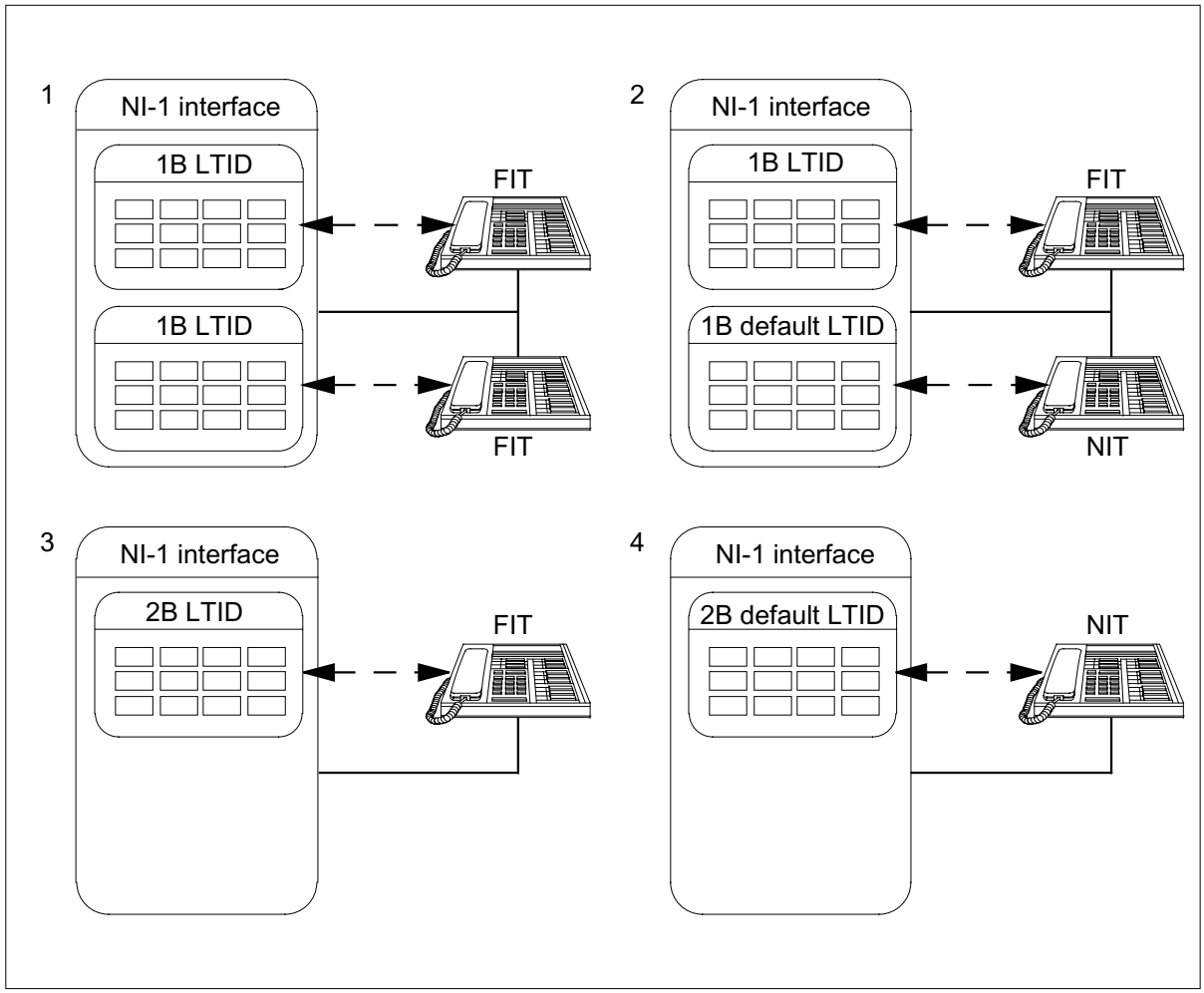
With the NI-1/NI-2 Interface Identification feature, the NA008 release provides support for NI-2 LTIDs, which are 2B-channel LTIDs with NI-2 capabilities. With the introduction of B-channel contention procedures in the B-Channel Manager Support feature, two NI-2 LTIDs can be assigned on an ISDN interface, provided each LTID is configured through datafill in table LTGRP (Logical Terminal Group) to use only one B-channel using the associated group capability. Two NI-2 LTIDs on the same line equipment number (LEN) are not required to have associated groups. Packet terminals are also supported on NI-2 interfaces.

Note: For more information about the associated group capability, refer to the “ISDN Support for Associated Group Indicators/Assignments per LTID" feature description in this document.

The following figures illustrate NI-1 ISDN interface configurations supported in NA007 and NI-2 ISDN interface configurations introduced in NA008.

NI-1/NI-2 Interface Identification (continued)

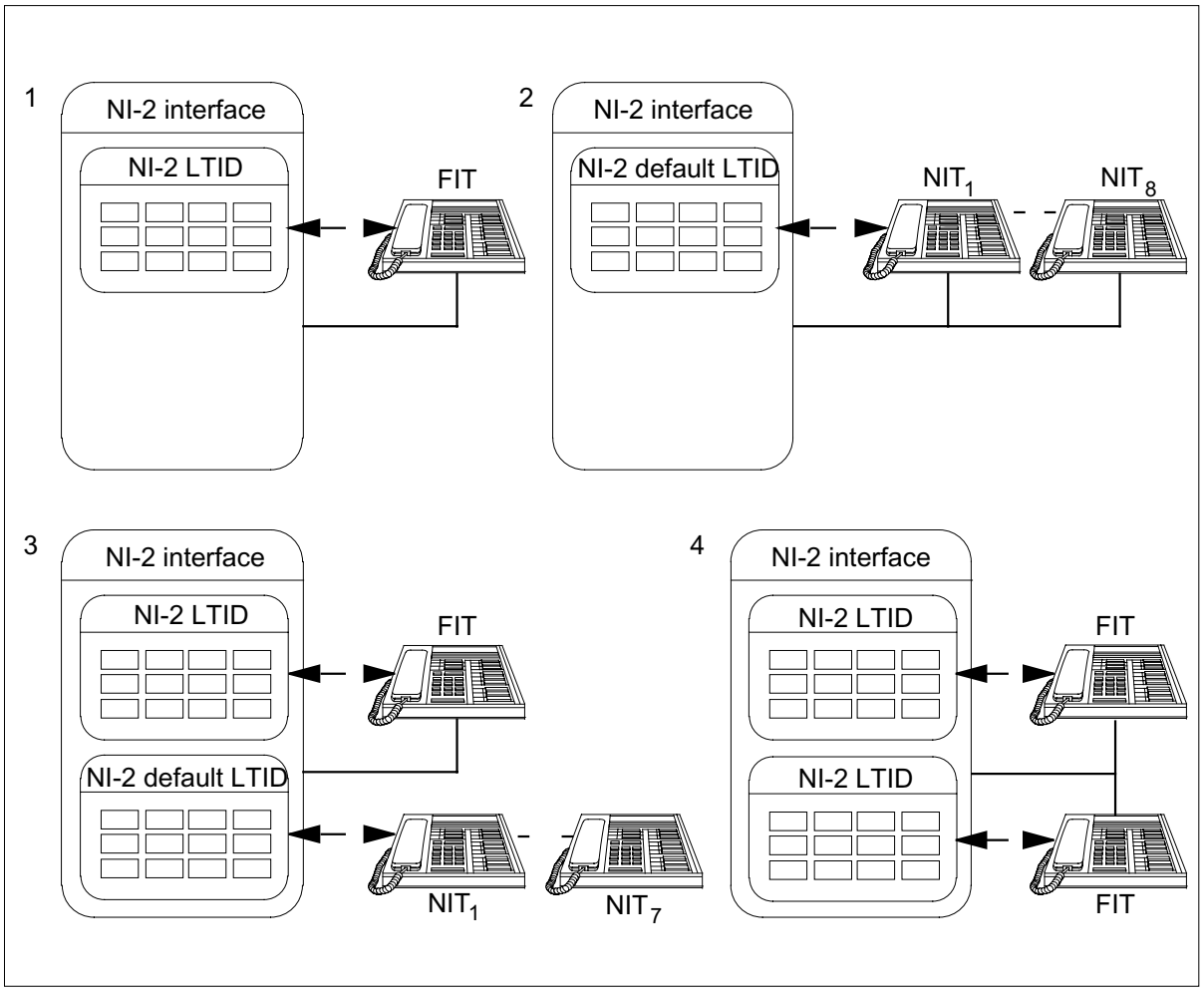
NI-1 ISDN interface con gurations suppor ted in NA007



In the preceding figure, configurations 1 and 2 are pre-NA007 configurations. The 2B-channel LTID was introduced in NA007 and is shown in configuration 3. Configuration 4 shows a default LTID that can support a single NIT.

NI-1/NI-2 Interface Identification (continued)

NI-2 ISDN interface con gurations intr oduced in NA008



In the preceding figure, configuration 1 shows the NI-2 LTID introduced in NA008. The NI-2 LTID is a 2B-channel LTID that supports NI-2 capabilities. Configuration 2 shows an NI-2 default LTID, which can support up to eight NITs, as specified by the TERML option. Support for up to two NI-2 LTIDs on an interface is shown in configurations 3 and 4. (In addition, there can be a packet B terminal attached to the interface.) Configuration 3 shows an NI-2 default LTID.

NI-1 compliant ISDN interfaces can support up to two physical terminals, while NI-2 compliant ISDN interfaces can support up to eight physical terminals. The ISDN interface assumes the characteristics of the first LTID assigned to it. Also, since NI-1 capabilities are different from NI-2 capabilities, NI-1 and NI-2 LTIDs cannot coexist on the same ISDN interface.

NI-1/NI-2 Interface Identification (continued)

The NI-1/NI-2 Interface Identification feature allows a provisionable number of NITs (from one to eight) to be supported on an NI-2 default LTID. This number is datafilled in table LTDEF (Logical Terminal Definition) using the Service Order System (SERVORD). The TERML option can be set to a value from 1 through 8 (a default value of 1 is assumed). The TERML option is valid only if the NI-2 LTID is defined to be a default LTID, since the number of terminals that can be associated with a fully initializing terminal (FIT) is always 1.

Translations table o w

NI-1/NI-2 Interface Identification does not affect translations table flow.

Limitations and restrictions

The following limitations and restrictions apply to NI-1/NI-2 Interface Identification:

- An NI-1 LTID cannot be changed to an NI-2 LTID using the SERVORD SLT (set up logical terminal) command with the CHA (change) subcommand. The NI-1 LTID must be detached using the SLT command with the DET (detach) subcommand, and redefined and reattached using the SLT command with the ADD (add new logical terminal) and ATT (attach logical terminal) subcommands.
- NI-1 and NI-2 LTIDs cannot coexist on the same interface, with the exception of packet terminals. Packet terminals can coexist with NI-2 LTIDs.
- The TERML option restricts the number of NITs that can be associated with an LTID. In effect, this translates to the number of NITs that the LTID can call process. The TERML option does not restrict the number of terminal endpoint identifiers (TEI) that can exist on the loop in a layer 2 mode.
- NI-2 LTIDs can be provisioned only on remote cluster controller 2 (RCC2), ISDN line trunk controller (LTCI), and ISDN line group controller (LGCI) peripherals.

Interactions

NI-1/NI-2 Interface Identification has no functionality interactions.

Activation/deactivation by the end user

NI-1/NI-2 Interface Identification requires no activation or deactivation by the end user.

NI-1/NI-2 Interface Identification (continued)

Billing

NI-1/NI-2 Interface Identification does not affect billing.

Data lling of ce parameter s

NI-1/NI-2 Interface Identification does not affect office parameters.

Data ll sequence

The following table lists the table that requires datafill to implement NI-1/NI-2 Interface Identification.

Data ll tab le required for NI-1/NI-2 Interface Identi cation

Table	Purpose of table
LTDEF	Logical Terminal Definition. This table defines the service profile of an ISDN LTID. ***Note:*** This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

Translation veri cation tools

NI-1/NI-2 Interface Identification does not use translation verification tools.

SERVORD

NI-1/NI-2 Interface Identification provides the capability to provision an NI-2 LTID using the SERVORD SLT ADD command. The CS (circuit-switched service) prompt is enhanced to accept a new value of NI2, which defines an NI-2 LTID.

The OPTION prompt for the SLT ADD and SLT CHA commands is enhanced to support the TERML parameter. This parameter specifies the number of NITs supported by an NI-2 default LTID. An error message is displayed if this parameter is defined for an NI-2 FIT.

The QLT (query logical terminal) command is modified to list NI2 and TERML as possible output values when using the command to query an NI-2 LTID.

The QLEN (query line equipment number) command is modified to list NI2 as a possible output value when using the command to query a LEN associated with an NI-2 LTID.

The characteristics of an ISDN BRI interface are dictated by the properties of the first circuit-switched LTID that is provisioned on it. This occurs during the

NI-1/NI-2 Interface Identification (continued)

execution of the SERVORD SLT ATT command. If the first LTID provisioned is an NI-1 LTID, the loop is identified as an NI-1 interface. If the first LTID provisioned is an NI-2 LTID, the loop is identified as an NI-2 interface. NI-1 and NI-2 LTIDs cannot coexist on the same interface, with the exception of packet terminals.

The following table lists the LTID assignment rules that are enforced during execution of the SERVORD SLT ATT, ADD, and CHA commands on ISDN LTIDs. It is assumed that LTID 1 is provisioned first, followed by LTID 2. Packet D terminals can be added as well, up to a maximum of eight physical terminals for each interface.

LTID assignment rules for ISDN interfaces (Sheet 1 of 2)

LTID 1	LTID 2	Interface type
NI-1 (1B or 2B)	--	NI-1
NI-1 (1B)	NI-1 (1B)	NI-1
NI-1	NI-2	Illegal configuration (NI-1 and NI-2 LTIDs cannot coexist on the same interface)
NI-2	--	NI-2
NI-2 (throttled to use one B-channel)	NI-2 (throttled to use one B-channel)	NI-2
NI-2	NI-1	Illegal configuration (NI-1 and NI-2 LTIDs cannot coexist on the same interface).
NI-2	Packet B	NI-2 ***Note:*** This configuration can also have two NI-2 LTIDs and one packet B terminal.
Packet B	NI-2	NI-2 ***Note:*** This configuration can also have two NI-2 LTIDs and one packet B terminal.
NI-2	Packet D	NI-2

NI-1/NI-2 Interface Identification (continued)

LTID assignment rules for ISDN interfaces (Sheet 2 of 2)

LTID 1	LTID 2	Interface type
Packet D	NI-2	NI-2
Packet B	Packet B	Not identified; defaults to NI-1

SERVORD limitations and restrictions

Attempts to change an NI-1 LTID to an NI-2 LTID or to change an NI-2 LTID to an NI-1 LTID using the SLT CHA command are blocked. The NI-1 LTID must be detached using the SLT DET command, and the NI-2 LTID must be redefined and reattached using the SLT ADD and SLT ATT commands.

SERVORD prompts

The following table shows the SERVORD prompts used to define an NI-2 default LTID and restrict the number of NITs supported by the LTID.

SERVORD prompts for NI-1/NI-2 Interface Identi cation (Sheet 1 of 2)

Prompt	Valid input	Explanation
CS	NI2	Defines an NI-2 default LTID
DEFLTERM	Y	Identifies an LTID as a default LTID
FUNCTION	ADD, CHA	Specifies the action required by the service order
LTCLASS	BRAFS	Specifies the class of a logical terminal based on the type of messaging exchanged between the terminal and the ISDN switch
LTID	a logical terminal group name (1 to 8 alphanumeric characters), followed by a space and a terminal number (1 to 1022)	Specifies the logical terminal identifier
MAXKEYS	2 to 64	Specifies the maximum number of feature activators (keys) on a logical terminal used for circuit-switched service

NI-1/NI-2 Interface Identification (continued)

SERVORD prompts for NI-1/NI-2 Interface Identi cation (Sheet 2 of 2)

Prompt	Valid input	Explanation
OPTION	TERML and value from 1 to 8	Specifies the number of NITs that can be supported on an NI-2 default LTID
PS	N = no packet service B = packet service on a B-channel D = packet service on the D-channel	Packet-switched service

SERVORD example for de ning an NI-2 default L TID using the SLT ADD command

The following SERVORD example shows how an NI-2 default LTID is defined using the SLT ADD command. The number of NITs associated with the LTID is restricted to 5 with the TERML option.

SERVORD example for NI-1/NI-2 Interface Identi cation in pr ompt mode

```
> SLT
SONUMBER:   NOW 96 7 1 PM
> (CR)
LTID:
> ISDN 100
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> NI2
PS:
> N
MAXKEYS:
> 64
DEFLTERM:
> Y
OPTION:
> TERML 5
OPTION:
> $
```

NI-1/NI-2 Interface Identification (continued)

SERVORD example for NI-1/NI-2 Interface Identi cation in no-pr ompt mode

```
> SLT $ ISDN 100 ADD BRAFS NI2 N 64 Y TERML 5 $
```

SERVORD example for changing the number of NITs supported by an NI-2 default LTID using the SLT CHA command

The following SERVORD example shows how the number of NITs supported by an NI-2 default LTID is changed using the SLT CHA command. The number of supported NITs is set to 6 using the TERML option.

SERVORD example for NI-1/NI-2 Interface Identi cation in pr ompt mode

```
> SLT
SONUMBER:   NOW 96 7 1 PM
> (CR)
LTID:
> ISDN 100
FUNCTION:
> CHA
OPTION:
> TERML 6
OPTION:
> $
```

SERVORD example for NI-1/NI-2 Interface Identi cation in no-pr ompt mode

```
> SLT $ ISDN 100 CHA TERML 6 $
```

SERVORD example for querying an NI-2 LTID using the QLT command

The following SERVORD example shows how an NI-2 LTID is queried using the QLT command.

```
> QLT ISDN 802
-------------------------------------------
LTID: ISDN 802
LT GROUP NO: 0
LTCLASS: BRAFS  DEFAULT LOGICAL TERMINAL: Y
EKTS: N  CACH: N
CS: NI2  PS: N  TEI: DYNAMIC
TERML: 6
VERSION: FUNCTIONAL ISSUE: 2
```

NI-1/NI-2 Interface Identification (end)

SERVORD example for querying a LEN associated with an NI-2 LTID using the QLEN command

The following SERVORD example shows how a LEN associated with an NI-2 LTID is queried using the QLEN command.

```
> QLEN 1 0 0 4
-------------------------------------------
LEN: HOST 01 0 00 04
ISG: 0  DCH: 0  ISG BRA CHANNEL: 1
CARDCODE: BX27AA  PADGRP: NPDGP
PM NODE NUMBER: 34
PM TERMINAL NUMBER: 5

TEI     LTID        CS  PS  BCH/ISG Bd
---     ----        --  --  ----------
DYNAMIC ISDN 802    NI2 N   -
```

4 Data lling NI0 NI-2 BRI Ser vices

The following chapter describes the NI0 NI-2 BRI Services, NI000052, functionality.

Call Forward/Interface Busy

Ordering codes

Functional group ordering code: NI000047

Functionality ordering code: not applicable.

Release applicability

NA013 and up

NA013 introduced Call Forward/Interface Busy.

Requirements

The Call Forward/Interface Busy feature has no functional group requirements.

Description

The Call Forward/Interface Busy (CFIB) feature provides the capability to forward calls to a remote directory number (DN) when the routelist to the base DN is busy. The term interface in this feature refers to the routelist entry in the routing tables. A routelist is considered busy when all routes in the routelist are call processing busy, out-of-service, or unavailable. In such situations, if the base DN subscribes to the CFIB feature, the call is redirected to a new DN, also known as the remote DN.

The targeted customers for CFIB are the internet service providers (ISP). One application of this feature is to forward the calls from a location in one time zone, whenever the routelist is busy, to another location in a different time zone where there may be less traffic. Another application of this feature is to provide a way to handle routing during disaster situations that cause the routelist to be unavailable.

The basis for CFIB subscription is by individual DN. All DNs that subscribe to CFIB are referred to as base DNs in this document. The DNs to which the calls are forwarded are referred to as remote DNs. The originating DN is the DN of the user that calls the base DN.

Two configurations of originating DN, base DN, and remote DN are depicted in the following figures. The first figure shows the originating DN and base DN located on the same stored program controlled system (SPCS) while the remote DN is on a remote SPCS.

Operation

When a call to a base DN fails due to the routelist being call processing busy, out-of-service, or unavailable and if the base DN subscribes to CFIB, then the switch forwards the call to a remote DN based on the bearer capability of the incoming call. The switch forwards the call to the remote DNs provided the following conditions are met:

- the call is a circuit-mode call
- this feature supports the bearer capability of the call
- the maximum redirection count is not reached

The redirection data, which consists of the original called number (OCN), the redirecting number (RGN), and the redirecting reason (RGR), are sent to the originator and the terminator.

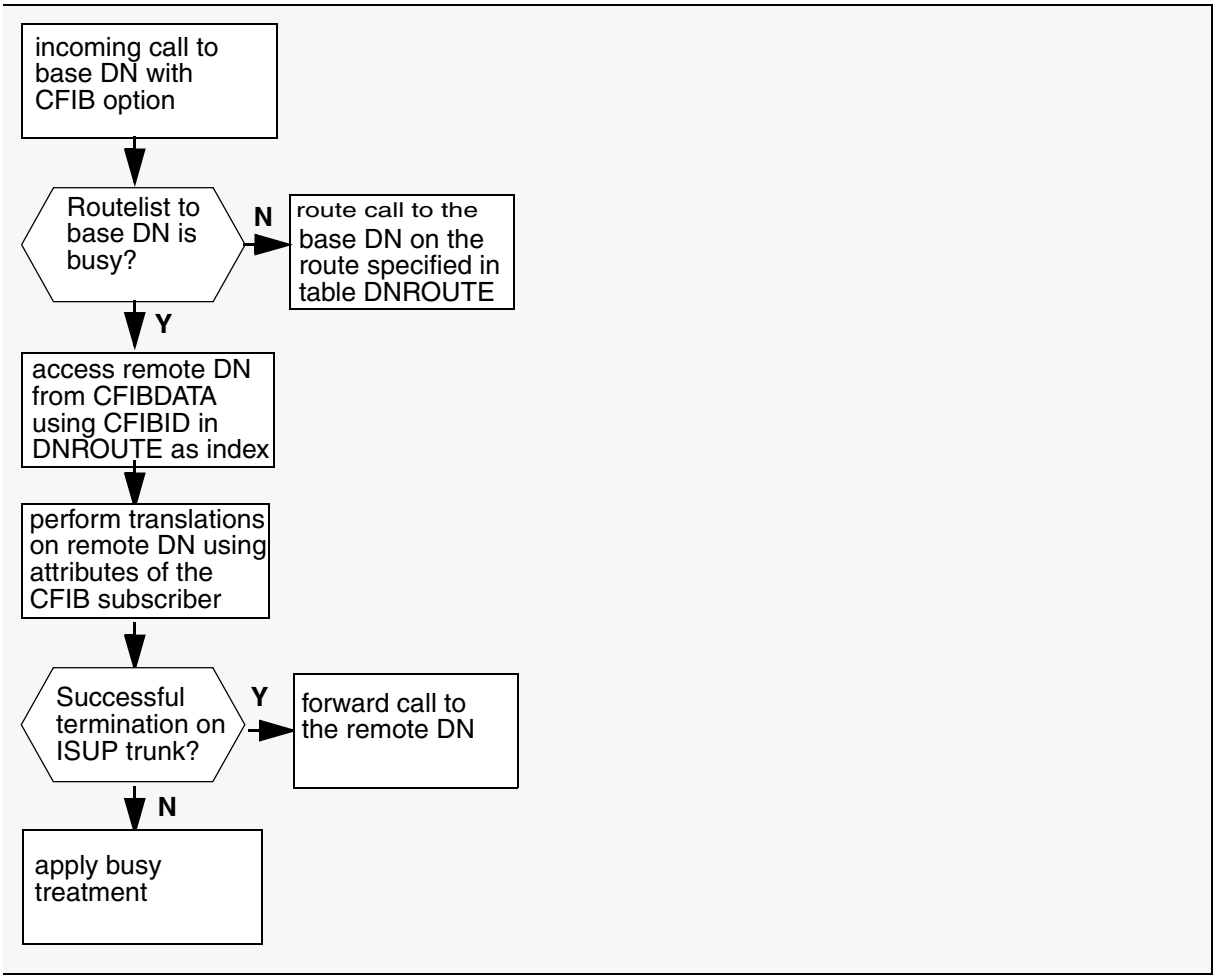
Translations table flow

The list that follows includes the Call Forward/Interface Busy feature translations tables:

- DNROUTE
- CFIBDATA

The flowchart that follows provides the Call Forward/Interface Busy feature translations process.

Table flow for Call Forward/Interface Busy



The table that follows lists the datafill content used in the flowchart.

Datafill example for Call Forward/Interface Busy

Datafill table	Example data
DNROUTE	613 722 8880 FEAT CFIB IBNRTE 20 CFIB1 ISDN 1012 6135551010 Y
CFIBDATA	CFIB1 5551000 5551007 7915551111 8015551003

Limitations and restrictions

The limitations and restrictions that follow apply to the Call Forward/Interface Busy feature.

- The base DN and the remote DN must be assigned on different switches. Therefore, CFIB can only be activated once for each call in the base SPCS.
- The remote DN must not subscribe to CFIB. The software does not enforce this restriction.
- Only the following types of originators support the CFIB feature:
  - PRI trunks
  - ISUP trunks
  - IBN MF trunks
  - BRI lines
  - POTS lines
  - RES lines
  - IBN lines
- The routelists that are still being referenced by the CFIB feature DNs in the DNROUTE table should not be deleted from the routing tables. This restriction is not enforced by software.
- This feature does not support the Routing table IRTE (for DMS-250).
- The provisioned remote DNs are not validated. It is the responsibility of the operating company personnel to ensure that the remote DNs provided are valid.
- The provisioning of all remote DNs is mandatory.
- This feature provides no software restriction to prevent other trunks besides National ISDN (NI2) and NTNA PRI trunks from being provisioned in the routelist to the base DN, However, testing is performed with NI2 and NTNA PRI trunks only.
- The calls forwarded as a result of CFIB must be terminated on ISUP trunks only.

- The provisioned billing DN in table DNROUTE must be a 10-digit number.
- A maximum of 255 tuples can be provisioned in table CFIBDATA.
- A maximum of 10,000 DNs are allowed to have CFIB provisioned in the DNROUTE table.
- Routing table RRTE is not supported.
- The capability of displaying information on the origination and termination display sets is not supported.
- Packet mode calls are not supported for CFIB.
- Database or TCAP type queries are not supported on the forwarding leg of CFIB. Portable numbers, E800 numbers, etc. cannot be datafilled as the remote DN (Forward-To number) for CFIB.

Interactions

The paragraphs that follow describe how Call Forward/Interface Busy interacts with other functionalities.

When Call Forward (CFW-all kinds), advanced intelligent network (AIN) redirections, key short hunt (KSH) or line overflow to DN (LOD) occurs before CFIB, the original called number (OCN) and the original redirecting reason (ORR) are provided by these redirection features. Redirecting number (RGN) and redirecting reason (RGR) are provided by the CFIB. In these cases, the RGN is the base DN provisioned with CFIB. The RGR is user busy.

Only AIN redirections are allowed to occur after CFIB. In this case, CFIB provides the OCN (the base DN) and ORR (user busy). AIN redirections provide the RGN and RGR.

If the routelist uses Super Trunk Group (SG selector) to the base DN, CFIB will be attempted after the maximum number of attempts (attempts for SG selector in routing tables) has been reached for the Super Trunk Group.

If the switch uses a virtual facility group (VFG) to route calls to a base DN. The size limitation in VIRTGRPS is the total number of calls present on the base DN route plus the number of active CFIB calls.

Activation and deactivation by the user

The Call Forward/Interface Busy feature does not require activation or deactivation by the user.

Billing

The Call Forward/Interface Busy feature generates two automatic message accounting (AMA) records. The feature generates one AMA record for the

originating DN to the base DN portion of the call. The feature generates a second AMA record for the base DN to the remote DN portion of the call. The second AMA record uses a special billing DN, which the DNROUTE table provisions. The CFIB feature appends the ISDN core module (Module 70/71) to the AMA record of the base DN to the remote DN portion of the call.

Station Message Detail Recording

The Call Forward/Interface Busy feature does not require Station Message Detail Recording.

Office parameters used by Call Forward/Interface Busy

The Call Forward/Interface Busy feature does not generate office parameters.

Datafill sequence

The table that follows lists the tables that require datafill to put Call Forward/Interface Busy into operation. You must enter data into the table in this order.

Datafill requirements for Call Forward/Interface Busy

Table	Purpose of table
DNROUTE	Directory Number Route contains information for programmable DNs, for example, it specifies the route and CFIB feature associated with a base DN.
CFIBDATA	Call Forward Interface Busy Data contains information about the DNs to which the call is to be forwarded.

Datafill related to Call Forward/Interface Busy for table DNROUTE

The table that follows provides the datafill related to the Call Forward/Interface Busy feature for the DNROUTE table. This table includes only those fields that apply directly to the Call Forward/Interface Busy feature.

Datafill related to table DNROUTE (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
FEAT		CFIB	Feature. Enter CFIB for the Call Forward/Interface Busy feature
TABNAME		OFRT, OFR2, OFR3, OFR4, IBNRTE, IBNRT2, IBNRT3, IBNRT4	Table name. Specify the routelist that is to be used to route the incoming call to the base DN.

Datafill related to table DNROUTE (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
INDEX		1–1023	Enter the index into the routing table.
CFIBID		A string of up to 16 characters	Index of table CFIBDATA used to get information about remote DNs.
CFIBBASE		common language location identifier (CLLI)	This PRI CLLI becomes the originator of the forwarded call to the remote DN, when all routes in the routelist are busy.
CFIBSBDN		A 10-digit number	Billing number to be used for the base DN to remote DN portion of the CFIB call
RPNPP		Y or N	Indicate whether the presentation of the remote party number (remote DN) is allowed. The default is Y.

Datafill example for table DNROUTE

The figure that follows shows sample datafill for the DNROUTE table.

MAP example for table DNROUTE

```
FEATURE  TABNAME   INDEX CFIBID  CFIBBASE CFIBSBDN    RPNPP
-------------------------------------------------------------
CFIB     IBNRTE    20    CFIB1   CLLI1    6135551010    Y
```

Error messages for table DNROUTE

The error messages that follow apply to the DNROUTE table.

Error messages for table DNROUTE

Error message	Explanation and action
THE NUMBER OF CFIB TUPLES CANNOT EXCEED 10,000.	The switch generates this message when the maximum number (10 000) of DNs provisioned with CFIB has been reached.
THE ENTERED CFIBID MUST BE PROVISIONED IN CFIBDATA	The switch generates this message while attempting to add a CFIB tuple in DNROUTE which has a CFIBID that is not provisioned in table CFIBDATA.
THE ENTERED ROUTE IS INVALID. THE ROUTE IS NOT PROVISIONED IN TABLE <specified table>.	The switch generates this message while attempting to add a CFIB tuple in DNROUTE that has an invalid route table index.
IRTE IS NOT SUPPORTED FOR CFIB	The switch generates this message while attempting to add a CFIB tuple in DNROUTE with IRTE as the routing table.
RRTE IS NOT SUPPORTED FOR CFIB.	The switch generates this message while attempting to add a CFIB tuple to table DNROUTE with RRTE as the routing table.
CANNOT FIND CFIBID IN CFIBDATA – DATA CORRUPTED	The switch generates this message while attempting to position on a CFIB tuple in DNROUTE that has a CFIBID that is out of range. The table CFIBDATA may be corrupt.

Datafill related to Call Forward/Interface Busy for table CFIBDATA

The table that follows provides the datafill related to the Call Forward/Interface Busy feature for the CFIBDATA table. This table includes only those fields that apply directly to the Call Forward/Interface Busy feature.

Datafill related to table CFIBDATA

Field	Subfield	Entry	Explanation and action
CFIBID		A string of up to 16 characters	CFIB identifier. This is the key to a tuple in table CIFBDATA. This identifier is specified in table DNROUTE for a DN subscribing to the CFIB option.
RDNSPCH		DN (maximum 15 digits)	DN to which the call is forwarded if the incoming bearer capability is Circuit-Mode Speech.
RDN3KAUD		DN (maximum 15 digits)	DN to which the call is forwarded if the incoming bearer capability is Circuit-Mode 3.1 KHz Audio.
RDN64KUD		DN (maximum 15 digits)	DN to which the call is forwarded if the incoming bearer capability is Circuit-Mode Unrestricted Digital Information (64 kbit/s)
RDNUDAD		DN (maximum 15 digits)	DN to which the call is forwarded if the incoming bearer capability is Circuit-Mode Unrestricted Digital Information adapted from 56 kbit/s to 64 kbit/s.

Datafill example for table CFIBDATA

The figure that follows shows sample datafill for the CFIBDATA table.

MAP example for table CFIBDATA

```
CFIBID  RDNSPCH    RDN3KAUD  RDN64KUD    RDNUDAD
------------------------------------------------
CFIB1   5551000    5551007   7915551111  8015551003
```

Error messages for table CFIBDATA

The error messages that follow apply to table CFIBDATA.

Error messages for table CFIBDATA

Error message	Explanation and action
TABLE CFIBDATA IS FULL. The maximum number of tuples that can be added is 255.	The switch generates this message when the maximum number (255) of CFIB tuples has been reached while attempting to add a tuple.
CANNOT FIND TUPLE–DATA CORRUPTED	The switch generates this message while attempting to position on a tuple in CFIBDATA which is out of range. The data may be corrupt.

Translation verification tools

The Call Forward/Interface Busy feature does not use translation verification tools.

SERVORD

The Call Forward/Interface Busy feature uses the Service Order System (SERVORD).

SERVORD limitations and restrictions

The Call Forward/Interface Busy feature has no SERVORD limitations or restrictions.

SERVORD prompts

The table that follows provides the SERVORD prompts used to add Call Forward/Interface Busy to a DN or block of DNs.

SERVORD prompts for Call Forward/Interface Busy (Sheet 1 of 3)

Prompt	Correct input	Explanation
SNPA	Valid SNPA provisioned in table TOFCNAME	Serving numbering plan area. Enter the area code for the DN.
BLOCK_OF_DNS	Yes or No	Block of directory numbers. Enter Yes if CFIB option is to be provisioned for a range of DNs.

SERVORD prompts for Call Forward/Interface Busy (Sheet 2 of 3)

Prompt	Correct input	Explanation
DN	Valid DN	Directory number. The switch displays this prompt if the response to the BLOCK_OF_DNS is NO. Enter a valid DN to which CFIB is to be provisioned.
FROM_DN	Valid DN	From directory number. The switch displays this prompt if the response to the BLOCK_OF _DNS is Yes. Enter the first DN in the range of DNs.
TO_DN	Last 3 digits in the range of DNs.	To directory number, The switch displays this prompt if the response to the BLOCK_OF _DNS is Yes and follows the FROM_DN prompt.
VDNTYPE	CFIB	Virtual directory number type. Enter CFIB for the Call Forward/Interface Busy feature.
TABNAME	OFRT, OFR2, OFR3, OFR4. IBNRTE, IBNRT2, IBNRT3, IBNRT4	Table name routelist. Enter the routing table that contains the routelist to the base DN.
INDEX	0–1023	Route index.Enter the route index of the table entered in response to the TABNAME prompt.
CFIBID	Valid index in table CFIBDATA	CFIB identifier.Enter the index into table CFIBDATA.

SERVORD prompts for Call Forward/Interface Busy (Sheet 3 of 3)

Prompt	Correct input	Explanation
CFIBSBDN	10-digit DN	CFIB special billing directory number.Enter the special billing DN used to bill the base DN to remote DN portion of the CFIB call.
RPNPP	Y or N	Remote party number presentation parameter. Enter Y or N to indicate whether the presentation of the remote party number (remote DN) is allowed.

SERVORD example to add Call Forward/Interface Busy

The SERVORD example that follows shows how to add the Call Forward/Interface Busy feature to a block of DNs with the SERVORD NEWDN command in prompt mode.

SERVORD example for Call Forward/Interface Busy in prompt mode

```
>NEWDN
SONUMBER:  NOW 99 6 18 PM
>
SNPA:
> 613
BLOCK_OF_DNS:
> YES
FROM_DN:
>7222000
TO_DN:
> 300
VDNTYPE:
> CFIB
CFIBSBDN:
> 6137221010
TABNAME:
> IBNRTE
INDEX:
> 20
CFIBID:
> CFIB1
RPNPP:
>Y
OPTION:
> $
```

The SERVORD example that follows shows how to add Call Forward/Interface Busy to a block of DNs with the SERVORD NEWDN command in no-prompt mode.

SERVORD example for Call Forward/Interface Busy in no-prompt mode

```
NEWDN $ 613 YES 7222000 300 CFIB 6137221010 IBNRTE 20 CFIB1
Y $
```

History

SN08 (DMS)

Q01038988: addition of a bullet point, concerning Database or TCAP type queries, to the Limitations and restrictions section.

Call Forwarding ISDN NI-2 Service Uniformity

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA012 and up

Requirements

To operate, Call Forwarding ISDN NI-2 Service Uniformity requires the functional groups that follow:

- BAS Generic, BAS00003
- MDC Minimum, MDC00001
- MDC Standard, MDC00003
- RES Service Enablers, RES00006

Description

Call Forwarding ISDN NI-2 Service Uniformity makes changes to the ISDN Call Forwarding feature in the following three areas.

Courtesy call on ISDN BRI

Call Forwarding ISDN NI-2 Service Uniformity modifies the provisioning of the CFXVAL (Call Forwarding Validation) option on a call type basis for NI-2 terminals. In NA011 during provisioning an entry of Y or N in the TERMOPT (termination) option field indicates whether or not a courtesy call must first be established and answered before Call Forwarding activates. Beginning with NA012, the Y and N are no longer valid entries in the TERMOPT field. The following four values replace Y and N as valid entries for the TERMOPT field. Call Forwarding ISDN NI-2 Service Uniformity provides for call processing for each of the four new CFXVAL TERMOPT values.

- ANSRQC—answer required with confirmation indicator
- ANSRQNC—answer required without confirmation indicator
- NANSR—no answer required
- NECC—do not establish courtesy call

Call Forwarding ISDN NI-2 Service Uniformity (continued)

Protocol message sequence

Call Forwarding ISDN NI-2 Service Uniformity changes the Q.931 signaling in the two chain of events that follow:

- the activation of the Call Forwarding feature on ISDN terminals
- the signaling used to notify a terminal in a forwarded state that a call to the terminal has been redirected. This activity is a reminder notification.

Originator to remote terminal subaddress cleanup

Call Forwarding ISDN NI-2 Service Uniformity meets the GR-853 requirement that the called party subaddress received from an originator does not pass to the remote station when a Call Forwarding feature forwards the call. In NA011, the DMS-100 switch passes on the called party subaddress for a call redirected by an ISDN Call Forwarding feature. Beginning with NA012, the DMS-100 switch does not pass on the called party subaddress if the call is redirected by an ISDN Call Forwarding feature.

Operation

The following sections describe the changes that Call Forwarding ISDN NI-2 Service Uniformity makes in the operation of option CFXVAL.

Feature activation changes

Call Forwarding ISDN NI-2 Service Uniformity adds a redirection number information element (RNN IE) to the feature activation message for the CFXVAL option. The RNN IE contains the remote DN to which the base station is being forwarded. The addition of an RNN IE is in compliance with general requirement GR-853.

Call Forwarding ISDN NI-2 Service Uniformity adds to the number of call variants for the CFXVAL option. These additional call variants make it possible to give the base station a confirmation indication before the system makes a courtesy call. A confirmation indication occurs if the call variant has the CFXVAL parameter TERMOPT set to ANSRQC. Another call variant removes the requirement that a courtesy call to the remote DN be answered before the Call Forwarding feature activates. This call variant has the CFXVAL parameter TERMOPT set to NANSR.

> ***Note:*** The Call Forwarding feature TERMOPT parameter value has no effect on feature key activation. Feature key activation never establishes a courtesy call.

Feature key activation changes

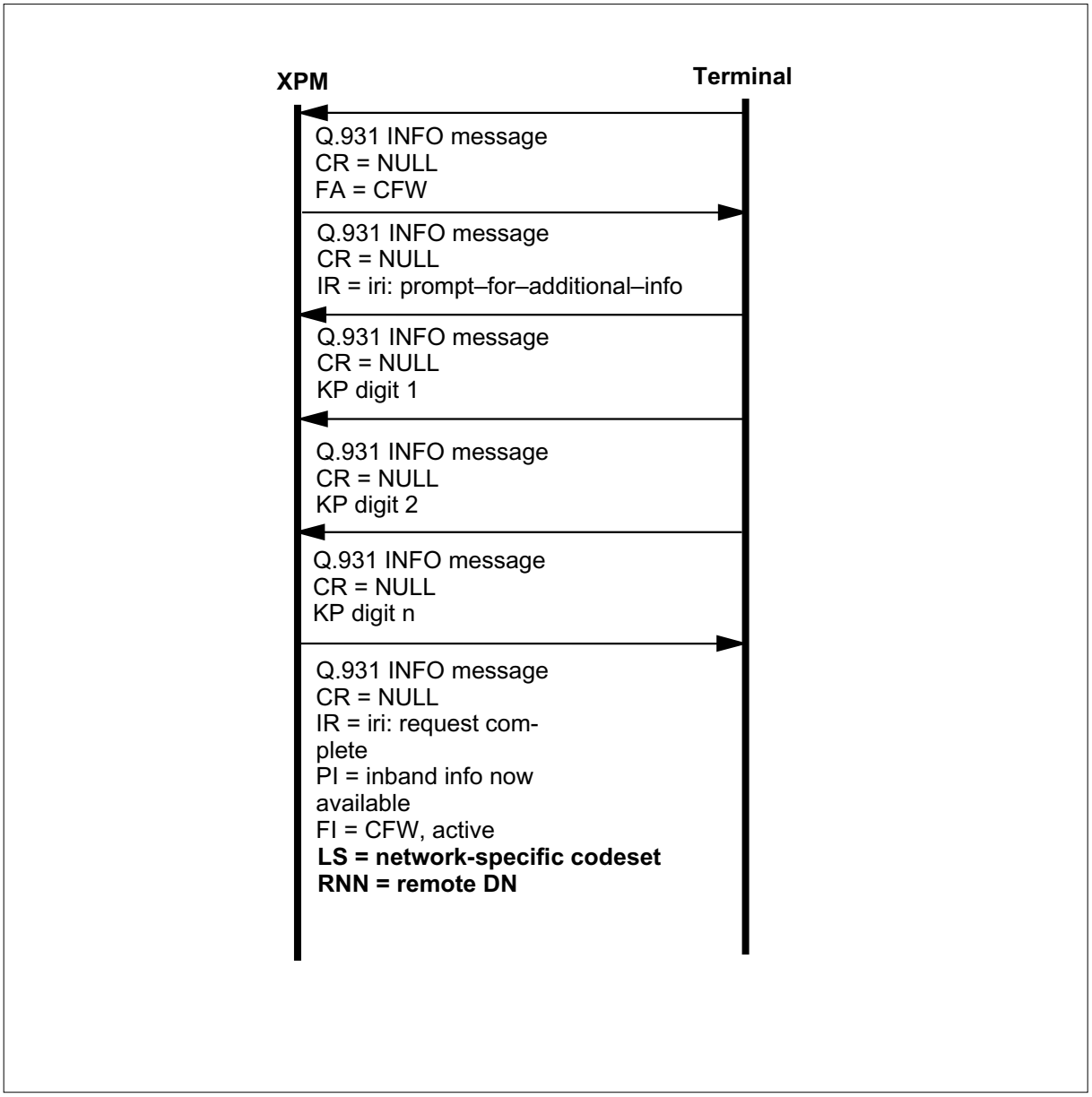
The addition of the RNN IE and the locking shift (LS) IE are the only changes to feature activation. The following figure shows the new protocol provided by

Call Forwarding ISDN NI-2 Service Uniformity (continued)

the Call Forwarding ISDN NI-2 Service Uniformity feature. Bold text indicates the changed sections of the protocol.

The following figure shows the Q.931 protocol messaging when a feature key is activated.

Feature key activation protocol message changes



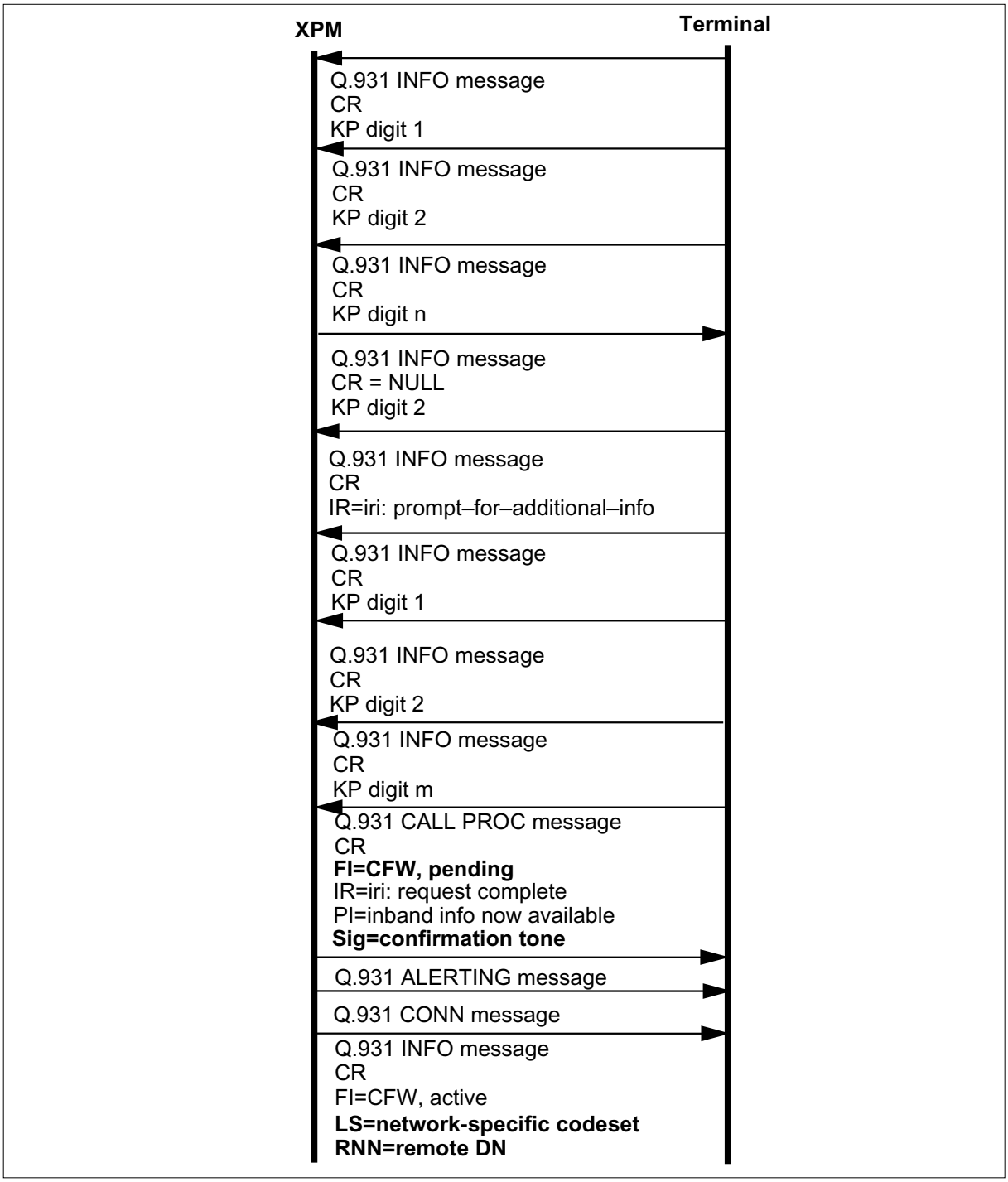
Call Forwarding ISDN NI-2 Service Uniformity (continued)

Dial access: TERMOPT-ANSRQC

The addition of CFXVAL parameter TERMOPT option ANSRQC changes the existing signaling used to provide the courtesy call answer required in two places. In the following figure the changes in the messaging are shown in bold text.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

Dial access: TERMOPT-ANSRQC messaging changes



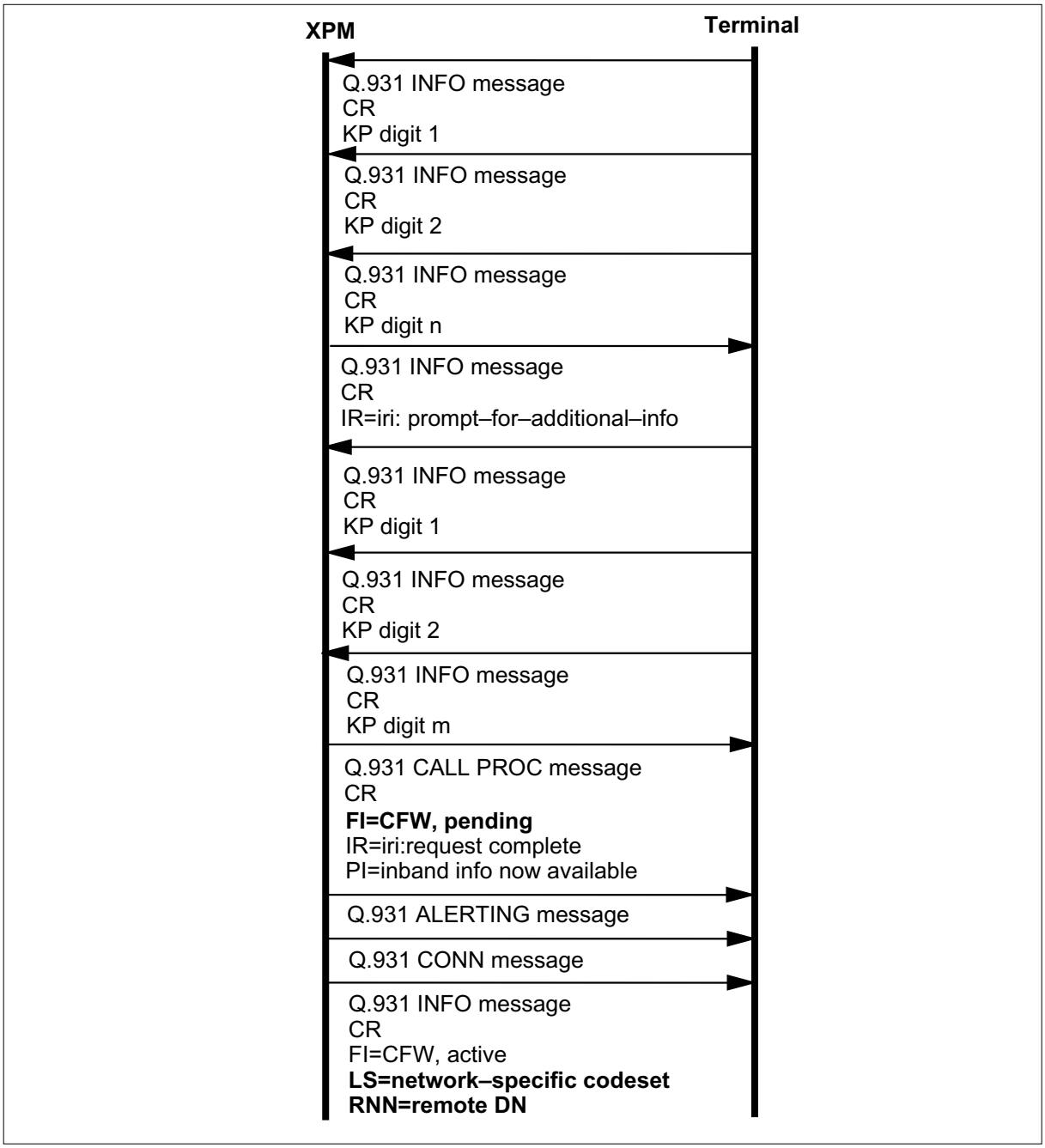
Call Forwarding ISDN NI-2 Service Uniformity (continued)

Dial access: TERMOPT-ANSRQNC

The signaling that provides courtesy call functionality when the TERMOPT is set to ANSRQNC is identical to the signaling used for the existing CFXVAL line option with TERMOPT set to Y. The following figure shows the messaging sequence for dial access when TERMOPT is set to ANSRQNC. Bold text indicates the changes in messaging.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

Dial access: TERMOPT-ANSRQNC messaging changes



Dial access: TERMOPT-NANSR

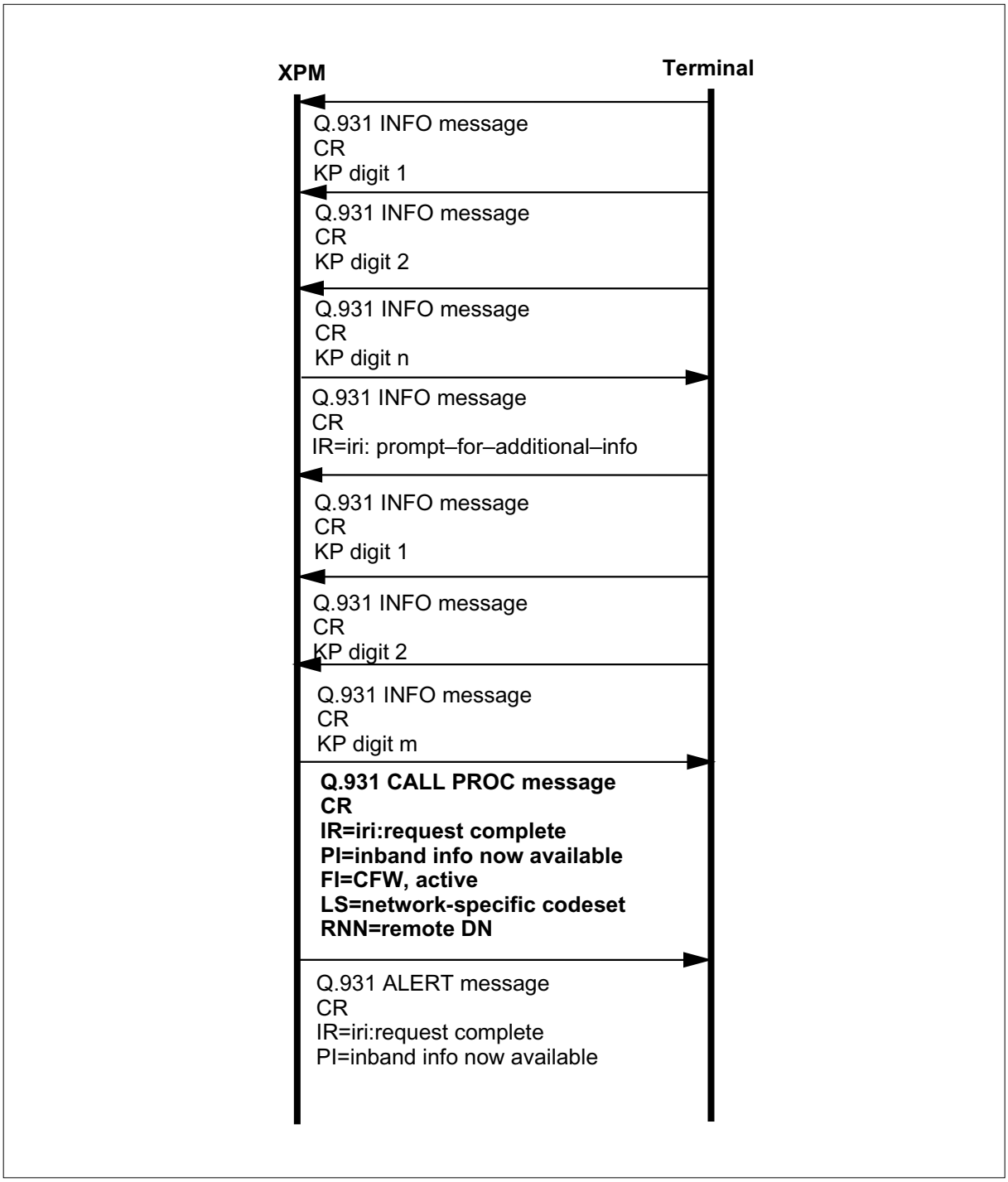
The signaling that provides the Call Forward activation when the TERMOPT is set to NANSR is new in NA012. The following figure which shows the

Call Forwarding ISDN NI-2 Service Uniformity (continued)

messaging sequence when activating Call Forward. Bold text indicates new messaging introduced in NA012.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

DIAL access: TERMOPT-NANSR messaging



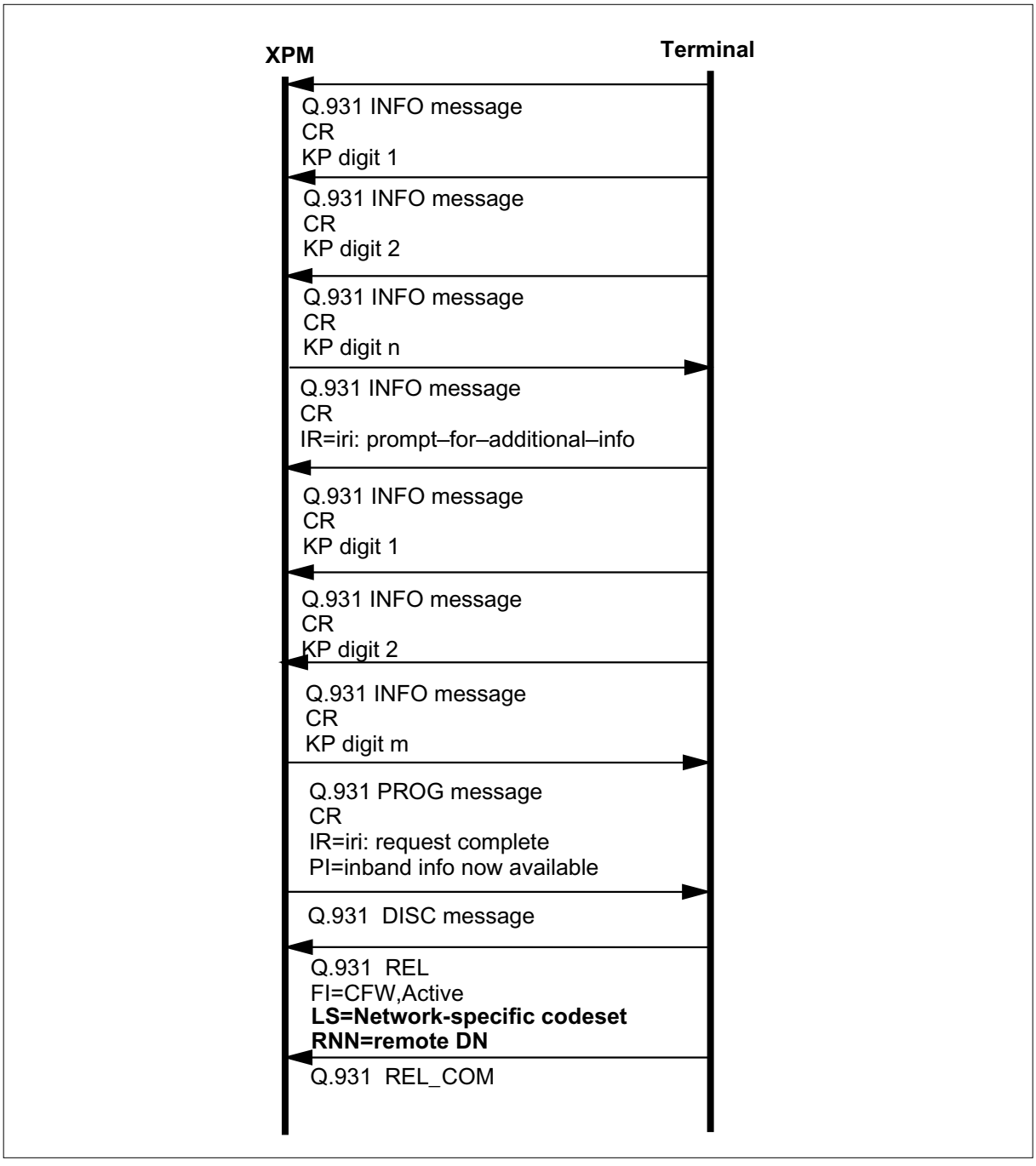
Call Forwarding ISDN NI-2 Service Uniformity (continued)

Dial access: TERMOPT-NECC

The signaling used to provide the NECC functionality is the same as the signaling used in the NA011 release for the CFXVAL option with a TERMOPT of N. In the following figure shows the messaging sequence for dial access with TERMOPT set to NECC. Bold text indicates changes for NA012. In this case, the user sends the DISC (disconnect) message.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

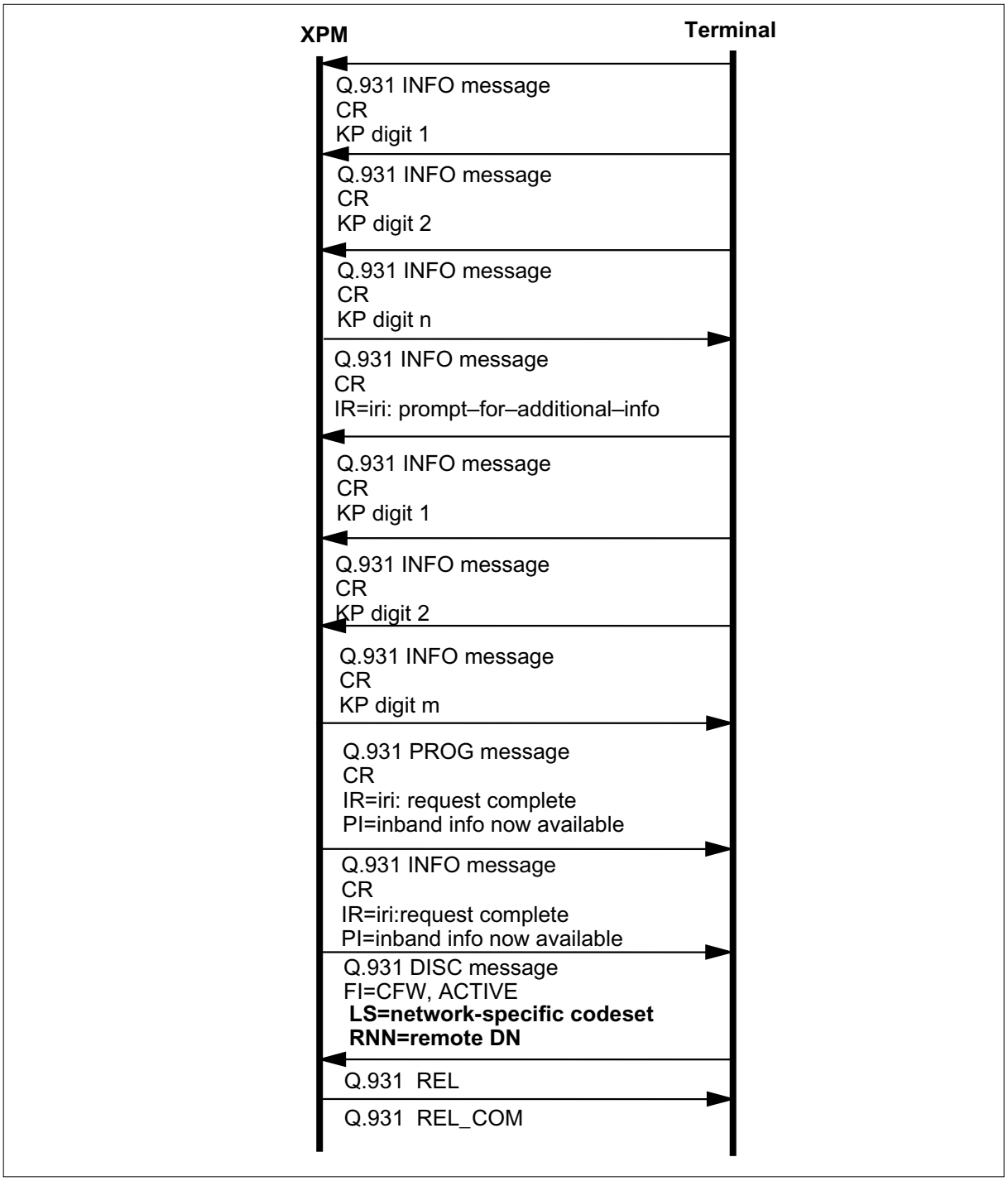
Dial access: TERMOPT-NECC messaging where user sends DISC



The following figure shows the messaging sequence for dial access with TERMOPT set to NECC. Bold text indicates changes for NA012. In this case the network sends the DISC message.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

Dial access: TERMOPT-NECC messaging where network sends DISC



Call Forwarding ISDN NI-2 Service Uniformity (continued)

Reminder noti cation messa ge

If the user subscribes to reminder notification, a Q.931 notify message is sent to the base station when a call to it is redirected by the Call Forwarding feature. The GR-853 requires the Q.931 message to include the following information elements (IE):

- call reference (CR)—null call reference
- bearer capability (BC)—of the redirected call
- notification indicator (NI)—call is forwarded
- signal (SIG)—coded as reminder ring
- calling party number (CGN)
- calling number subaddress (CGS)
- called party number (CDN)
- first redirecting number (RN1)
- last redirecting number (RGN)

Note 1: The system software only generates a reminder notification message for terminals with the CFXDNCT (Call Forwarding on a directory number call type) feature. Terminals with a pre-NI-2 Call Forwarding feature continue to use the signaling used in the NA011 release.

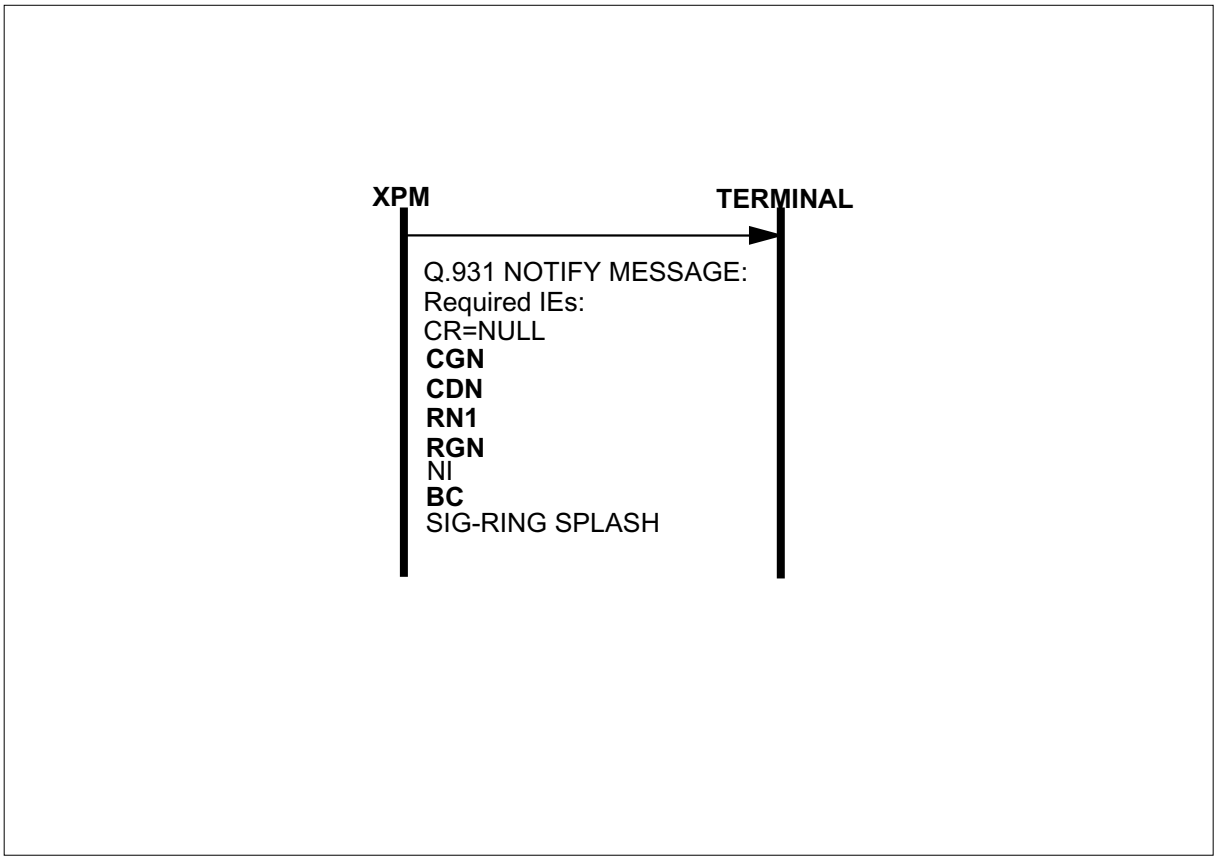
Note 2: The EID IE (endpoint identifier information element) replaces the CDN IE for EKTS CACH terminals.

Note 3: The reminder notification message only includes CDN, CGN, CGS, RN1, RGN IEs if the terminal subscribes to the delivery of that IE.

The following figure lists the new information elements added to the reminder notification message in NA012. Bold text indicates information elements added in NA012.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

Reminder noti cation messa ge



Originator to remote terminal subaddress cleanup

Feature Call Forwarding ISDN NI-2 Service Uniformity meets the GR-853 requirement that the called party subaddress received from an originator does not pass to the remote station when a Call Forwarding feature forwards the call. In NA011, the DMS-100 switch passed on the called party subaddress if the call is redirected by an ISDN Call Forwarding feature. Beginning with NA012 this is no longer the case.

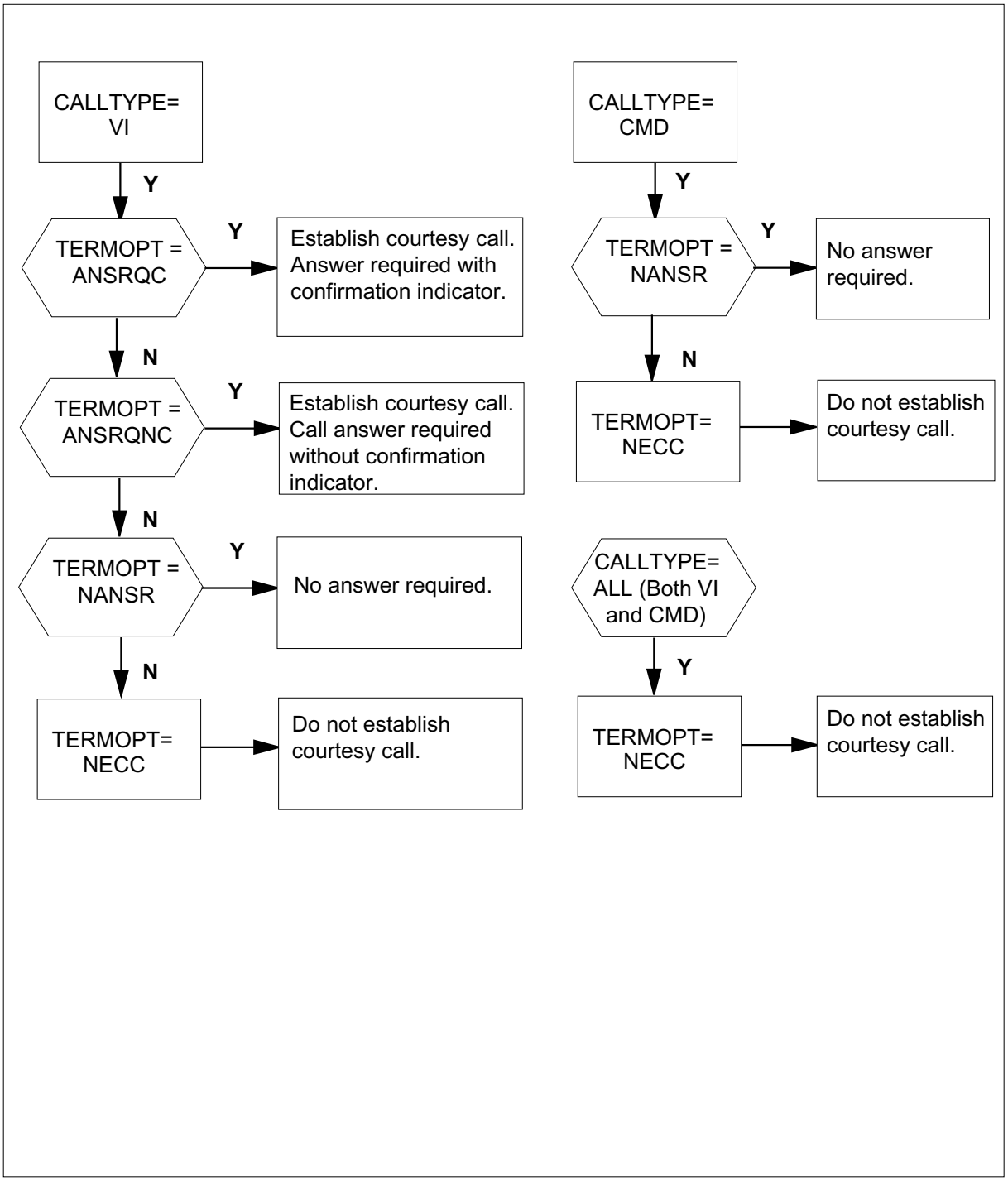
Translations table o w

Feature Call Forwarding ISDN NI-2 Service Uniformity requires data entry in table KSETFEAT for option CFXVAL. Option CFXVAL, courtesy call, and route validation are automatically updated in table KSETFEAT when assigned by SERVORD.

The Call Forwarding ISDN NI-2 Service Uniformity translation process is shown in the flowchart that follows.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

Table o w for option CFXVAL



Call Forwarding ISDN NI-2 Service Uniformity (continued)

The table that follows lists the datafill content used in the flowchart.

Data ll e xample for Call Forwarding ISDN NI-2 Service Uniformity

Datafill table	Example data
KSETFEAT	ISDN 1 1 CFXVAL CFXVAL (VI NECC) (CMD NECC) $

Limitations and restrictions

The limitations and restrictions that follow apply to Call Forwarding ISDN NI-2 Service Uniformity:

- The CFXVAL option can only be added to an NI-2 terminal that has the option CFXDNCT and a subfeature of CFF, CFI, or CFU.
- The CFXVAL option must be assigned to a DN appearance of key 1.
- Assignment of CFXVAL to a feature activation key (FA) is not allowed.
- The maximum number of TERMOPT values assigned to a terminal is two. The first value is for voice information (VI) CTs and the second is for circuit mode data (CMD) CTs.
- TERMOPT values ANSRQC and ANSRQNC are not supported for the CMD CT.
- The only valid SERVORD entries for the TERMOPT value for call type CMD are NANSR and NECC.
- The changes to the NOTIFY message used for the reminder to forwarded terminals only effect NI-2 terminals with the CFXDNCT option. These changes do not effect other types of Call Forwarding.
- The CHF command can not be used to change the CT associated with CFXVAL. The only way to change the CT of an existing CFXVAL option is to remove and then re-add the CFXVAL option using SERVORD.

Interactions

Call Forwarding ISDN NI-2 Service Uniformity does not interact with other functionalities.

Activation and deactivation by the user

The CFXVAL feature activates as part of a chain of events when a user tries to activate an NI-2 CFXDNCT feature. This activation applies only to the CFXDNCT subset features Call Forwarding Intragroup (CFI), Call Forwarding Fixed (CFF), and Call Forwarding Universal (CFU). The provisioning of the CFXVAL option on an ISDN terminal is done on a CT basis. In order for the CFXVAL option to be activated, the CT that is activating

Call Forwarding ISDN NI-2 Service Uniformity (continued)

one of the previously listed Call Forwarding types must have the CFXVAL option assigned.

There are four possible termination option values (TERMOPT) that can be assigned to option CFXVAL during SERVORD provisioning. One TERMOPT value can be assigned to each CT. The terminating option value assigned effects the call processing events set off when the user activates the Call Forwarding feature. The termination option values are

- ANSRQC—Requires a courtesy call to the remote DN that is answered and a confirmation indicator.
- ANSRQNC—Requires a courtesy call to the remote DN that is answered, but does not require a confirmation indicator.
- NANSR—Validates route to remote DN, but does not require an answer to courtesy call.
- NECC—Does not establish a courtesy call.

Note: Courtesy call does not apply to the CMD CT that has the CFXVAL termination option set to NECC.

CFU, CFF, and CFI on NI-2 ISDN terminals are activated by a single depression of a feature activation (FA) key.

Activation and deactivation of Call Forwarding ISDN NI-2 Service Uniformity

At your telephone

1 Press the CFW FA key for the DN you want to forward.

2 Dial the digits of the remote DN to forward calls to, or wait without dialing any remote digits in which case the previously stored remote DN address digits are used. In the case of CFF, the digits used are those stored during SERVORD provisioning.

3 If the TERMOPT eld of the CFXVAL option is set to ANSRQC, the switching system does the following:

1. Establishes a courtesy call to a remote DN to validate the remote DN's route and the ability of the remote DN to accept an incoming call before activating Call Forwarding feature.
2. If the courtesy call is answered, a con r mation tone is given to the user to signal the successful validation and storing of the forwarding DN.
3. Sets lamp to solid non-blinking state to alert user of successful activation of Call Forwarding feature.
4. If courtesy call goes unanswered or receives a busy signal and a second courtesy call attempt is made within 2 minutes of the rst call attempt, CFW becomes active for the base station.

4 If the TERMOPT eld of the CFXV AL option is set to ANSRQNC, the switching system establishes a courtesy call to validate the routing and

Call Forwarding ISDN NI-2 Service Uniformity (continued)

termination of the remote DN, but does not provide the base station with a con r mation indicator.

5 If the TERMOPT eld of the CFXV AL option is set to NANSR, the switching system validates the route and establishes a courtesy call to the remote DN, but does not require the remote DN to answer the call.

6 If the TERMOPT eld of the CFXV AL option is set to NECC, the switching system validates the route, but does not establish a courtesy call to the remote DN.

Billing

Call Forwarding ISDN NI-2 Service Uniformity does not generate billing records or changes.

Of ce parameter s used by Call Forwarding ISDN NI-2 Service Uniformity

Call Forwarding ISDN NI-2 Service Uniformity does not generate office parameters.

Data ll sequence

Call Forwarding ISDN NI-2 Service Uniformity does not affect datafill sequence.

Data ll related to Call Forwar ding ISDN NI-2 Service Uniformity for table KSETFEAT

The table that follows provides the datafill related to Call Forwarding ISDN NI-2 Service Uniformity for table KSETFEAT. This table includes only those fields that apply directly to Call Forwarding ISDN NI-2 Service Uniformity.

Data ll related to tab le KSETFEAT (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
FEATKEY		see subfields	KSET feature key. This field consists of subfields LEN, KEY, and FEAT.
	LEN	see subfields	Line equipment number. This field defines the physical location of the equipment that is connected to a specific telephone line. For ISDN lines the field len consists of logical terminal group name (LTGRP) and logical terminal number (LTNUM) 1 to 1022.
	KEY	1 to 69	Physical key. Enter the number of the DN key that has feature CFXVAL assigned to it.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

Data ll related to tab le KSETFEAT (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	FEAT	CFXVAL	Feature. Enter CFXVAL to assign this feature to the specified key.
KVAR		see subfield	Key variable area. This field consists of a list of call types made up of subfields CALLTYPE and TERMOPT.
	CALLTYPE	CMD, VI, $	Call type. Enter calltype to assign this feature. At the prompt for CALLTYPE, enter one of the following choices: CMD to assign feature to circuit mode data calls. VI to assign feature to voice information calls. $ to indicate no further entry.
	TERMOPT	ANSRQC, ANSRQNC, NANSR, NECC	Termination option. Enter one of the following termination option values for the selected call type: ANSRQC if courtesy call requires an answer with confirmation indicator. ANSRQNC if courtesy call requires an answer but no confirmation indicator. NANSR if route is validated, but requires no answered courtesy call. NECC if no courtesy call established. ***Note:*** For call type VI, all TERMOPT values are supported. NANSR and NECC are the only TERMOPT values supported for call type CMD.

Data ll e xample for table KSETFEAT

The figure that follows shows sample datafill for table KSETFEAT.

Call Forwarding ISDN NI-2 Service Uniformity (continued)

MAP example for table KSETFEAT

```
FEATKEY     FEATURE   KVAR
-----------------------------------------------------------
ISDN 1 1 CFXVAL CFXVAL (VI NECC) (CMD NECC) $
```

SERVORD

SERVORD limitations and restrictions

The SERVORD limitations and restrictions that follow apply to option CFXVAL:

- TERMOPT values ANSRQC and and ANSRQNC are not supported for the CMD call type.
- The call type associated with the CFXVAL option can not be changed using the CHF command. The only way to change the call type of an existing CFXVAL option assignment is to remove and then re-add the CFXVAL option.

SERVORD prompts

The table that follows provides the SERVORD prompts used to add the CFXVAL option to a call type on an LTID.

SERVORD prompts for CFXVAL (Sheet 1 of 2)

Prompt	Correct input	Explanation
DN_OR_LEN		Specifies the LTID of the NI-2 call type to which CFXVAL will be assigned.
OPTKEY	1	Specifies the DN on the ISDN set to which CFXVAL option is assigned.
OPTION	CFXVAL	Specifies the option associated with a service to be established, modified, or deleted from the specified LTID.

Call Forwarding ISDN NI-2 Service Uniformity (end)

SERVORD prompts for CFXVAL (Sheet 2 of 2)

Prompt	Correct input	Explanation
CALLTYPE	ALL, CMD, VI, $	Specifies the call type to which CFXVAL option is assigned. An entry of ALL specifies both CMD and VI call types. $ indicates no further input.
TERMOPT	ANSRQC, ANSRQNC, NANSR, NECC	Specifies the termination option value assigned to a call type. ***Note:*** TERMOPT values ANSRQC and ANSRQNC are not supported for the CMD call type.

SERVORD example to add CFXVAL

The SERVORD example that follows shows how to add option CFXVAL to an LTID call type with the ADO command in prompt mode.

SERVORD example for adding option CFXVAL in prompt mode

```
>ADO
SONUMBER:     NOW 99 2 10 PM
>$
DN_OR_LEN:
>ISDN 45
OPTKEY
>1
OPTION:
>CFXVAL
CALLTYPE:
>VI
TERMOPT:
>NECC
CALLTYPE:
>$
OPTKEY:
>$
```

The SERVORD example that follows shows how to add option CFXVAL to an LTID call type with the ADO command in no-prompt mode.

SERVORD example for adding option CFXVAL in no-prompt mode

```
>ADO $ ISDN 45 1 CFXVAL VI NECC $ $
```

Calling Number Information Services Uniformity (CNISU)

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: does not apply

Release applicability

NA012 and up

NA012 introduced Calling Number Information Services Uniformity (CNISU).

Requirements

This document includes all the data table information for this functionality. Complete use of this functionality can require software or hardware not described in this document.

Description

CNISU continues NI-2 compliance for CNIS for NI-1 and NI-2 basic rate access functional sets (BRAFS) on the DMS-100 switch. This feature provides the following functionality:

- makes sure of the uniform delivery of the type of number (TON) and the numbering plan indicator (NPI) to the customer premises equipment (CPE)
- creates office parameters for Calling Number Delivery (CND) and Redirecting Number Delivery (RND) to allow office-wide number delivery

Operation

This section describes changes to the TON and NPI compliance and the CND and RND office parameters.

TON and NPI compliance

This feature makes sure that the switch sends only valid NI-2 compliant TON and NPI combinations to the CPE. To determine the values sent to the CPE, the switch evaluates the calling number's (CGN) TON and NPI as a

Calling Number Information Services Uniformity (CNISU) (continued)

combination. When the switch receives a CGN parameter, it returns the TON/NPI values in the following table.

Note: When the switch does not receive a CGN, it uses a TON/NPI indicator of UNKNOWN/UNKNOWN.

National and international numbers received in CGN parameter

Nature of address field	Numbering plan field	TON/NPI used by DMS-100
national number	E.164	national number in ISDN numbering plan (E.164)
international number	E.164	international number in ISDN numbering plan (E.164)
any	any	UNKNOWN

CND and RND of ce parameter s

This feature adds another delivery mechanism for CND and RND. The CND_BRI_OFFICE parameter in table ISDNVAR, when enabled, allows delivery of CND to an office. The RND_BRI_OFFICE parameter in table ISDNVAR, when enabled, allows delivery of RND to an office. (CND and RND must be available to allow delivery.)

Note: For delivery to be available, either option CLID (for CND) or option RNID (for RND) is on the customer group, or the parameter KSET_INTER_GRP_DISP in table OFCENG is TRUE, or the call is intragroup.

Before this feature, the CND and RND line options and the CNDBRI and RNDBRI customer group options were the only CND and RND delivery mechanisms. CND and RND require one availability and one delivery mechanism. The absence of other delivery and availability mechanisms does not block delivery.

For a complete description of CND, see the “ISDN Calling Number Delivery/Name and Number Privacy" and the “CND Customer Group Control for BRI" feature descriptions in this document.

For a complete description of RND, see the “Redirecting Number and Reason Delivery for ISDN CFW" feature description in this document.

Calling Number Information Services Uniformity (CNISU) (continued)

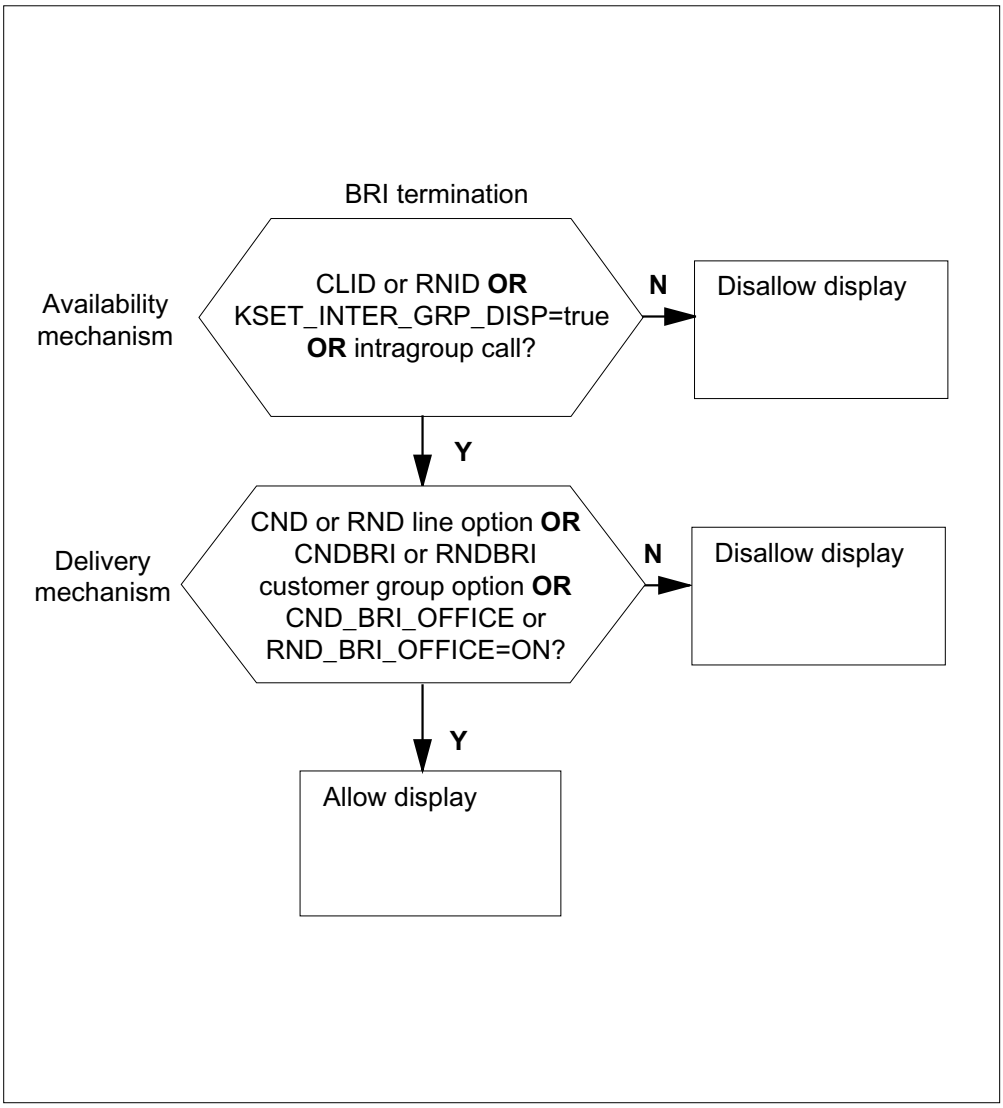
Translations table o w

The list that follows includes the Calling Number Information Services Uniformity (CNISU) translations tables:

- Table ISDNVAR contains the office parameters CND_BRI_OFFICE and RND_BRI_OFFICE, which allow delivery of CND and RND, in the sequence given, to an office.

The flowchart that follows provides the Calling Number Information Services Uniformity (CNISU) translations process.

Table o w for Calling Number Information Services Uniformity (CNISU)



Calling Number Information Services Uniformity (CNISU) (continued)

The table that follows lists the datafill content used in the flowchart.

Data ll e xample for Calling Number Information Services Uniformity (CNISU)

Datafill table	Example data		
ISDNVAR	CND_BRI_OFFICE	TRUERND_BRI_OFFICE	TRUE

Limitations and restrictions

Calling Number Information Services Uniformity (CNISU) has the following limitations or restrictions:

- If reverse translations are ON in table CUSTNTWK, the switch returns UNKNOWN/UNKNOWN in the TON/NPI fields.
- If field INTRAGRP in table IBNXLA=Y and the call is intragroup, the switch returns ABBREVIATED/PRIVATE in the TON/NPI fields.

Interactions

Calling Number Information Services Uniformity (CNISU) does not interact with other functionalities.

Activation and deactivation by the user

Calling Number Information Services Uniformity (CNISU) does not require activation or deactivation by the user.

Billing

Calling Number Information Services Uniformity (CNISU) does not generate billing records or changes.

Station Message Detail Recording

Calling Number Information Services Uniformity (CNISU) does not require Station Message Detail Recording.

Calling Number Information Services Uniformity (CNISU) (end)

Of ce parameter s used by Calling Number Information Services Uniformity (CNISU)

The table that follows lists the office parameters used by Calling Number Information Services Uniformity (CNISU). For additional information about office parameters, refer to the *Office Parameters Reference Manual*.

Of ce parameter s used by Calling Number Information Services Uniformity (CNISU)

Table name	Parameter name	Explanation and action
ISDNVAR	CND_BRI_OFFICE	This office parameter controls delivery of Calling Number Delivery to an office. Set this parameter to ON to enable delivery of CND to all lines in the office.
ISDNVAR	RND_BRI_OFFICE	This office parameter controls delivery of Redirecting Number Delivery to an office. Set this parameter to ON to enable delivery of RND to all lines in the office.
Note: An availability mechanism must be present for CND and RND to deliver.		

Data ll sequence

Calling Number Information Services Uniformity (CNISU) does not affect datafill sequence.

Translation veri cation tools

Calling Number Information Services Uniformity (CNISU) does not use translation verification tools.

SERVORD

Calling Number Information Services Uniformity (CNISU) does not use the Service Order System (SERVORD).

CFD Continue Existing Treatment Enhancements with SS7

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA012 and up

NA012 introduced CFD Continue Existing Treatment Enhancements with SS7.

Requirements

CFD Continue Existing Treatment Enhancements with SS7 has no functional group requirements.

Description

The full feature name is Call Forwarding Don't Answer Continue Existing Treatment Enhancements with SS7. This document refers to the feature as CFDCET with SS7. This document refers to the basic Call Forwarding Don't Answer feature as CFD.

The basic application of CFD over SS7 trunks performs no “look ahead" to determine whether a forwarded call can terminate on the remote station. The system provides the call originator with audible ringing followed by a busy signal if the call is forwarded with the CFD feature over SS7 trunks to a busy station.

CFDCET with SS7 improves operation of the CFD feature over SS7 trunks. The switch does not forward calls unless the remote station is not busy and an idle SS7 trunk is available. If the switch determines that the remote station is busy, the base station continues to provide audible ringing to the originator.

Operation

In the NA011 DMS version of intra-switch CFD, the switch performs a “look ahead" before it clears the base station. After the call forward timer expires, if the switch determines that the remote station is busy, it does not forward the call and the base station continues to ring. The result is that the call can still terminate at the base station.

This feature provides an inter-switch Telcordia Technologies (formerly Bellcore) compliant solution. The DMS application is like the current intra-switch CFD application. The operating company can provision the

CFD Continue Existing Treatment Enhancements with SS7 (continued)

customer group to clear the base. Or the operating company can provision the group to continue to ring the base when the switch determines that the remote DN is busy. Telcordia Technologies compliant operation allows the system to clear the base when the attempt to forward to the remote station fails because of a busy remote DN or trunk. The originator continues to receive the audible ringing provided by the base DN.

The CFDCET with SS7 feature can operate so that the base continues to ring when the remote station is busy. The originator continues to receive the audible ringing provided by the base DN, but the base DN can complete the call. This functionality is different from intra-switch CFD. That is, if the busy remote releases after the Call Forward Don't Answer Timer (CF-T2) expires, the switch does not forward the call to the remote as it does in the intra-switch DMS version of CFD.

The CFDCET with SS7 feature uses SS7 messages to determine if the remote station is available to receive the call. If SS7 supports the outgoing circuit, the integrated services digital network (ISDN) subsystem sends an Initial Address Message (IAM) to the remote station. The connections to the remote station remain unbroken, and the station continues to ring. If the outgoing circuit is busy or if SS7 does not support the connection, the base station continues to ring if the CFDCET option is ALERT_BASE. If the CFDCET option is CLEAR_BASE, the system clears the base station and the originator continues to receive audible ringing.

The actions of the base stored program controlled switch (SPCS), after it sends an IAM to the remote SPCS, depend on the next message the base SPCS receives. The following is a list of possible actions:

- If the base station receives an Address Complete Message (ACM) and the remote interface is idle, then the SPCS stops the existing treatment, clears the base station, and completes the connection to the remote DN. The treatment applied at the remote switch is passed back to the originator.
- If the base station receives an ACM that indicates the switch cannot complete the call, the SPCS releases the outgoing circuit and clears the base station if the CFDCET option is CLEAR_BASE. If the CFDCET option is ALERT_BASE, the system releases the outgoing circuit. The current connections to the base station remain unbroken.
- If the base station receives an SS7 REL, the SPCS releases the outgoing circuit and clears the base station if the CFDCET option is CLEAR_BASE. If the CFDCET option is ALERT_BASE, the system releases the outgoing circuit and the current connections remain unbroken.

CFD Continue Existing Treatment Enhancements with SS7 (continued)

- If the base station receives an answer message (ANM), the SPCS stops the original call treatment and completes the connections to the remote DN.
- If the base station answers the call before it receives any of these messages or after the SPCS determines that the termination is not successful at the remote station, then the call terminates at the base station.

ISDN and non-ISDN interactions with non-SS7 trunks

This feature allows for Telcordia Technologies GR-853 compliance for ISDN bases and it also provides the “look ahead" ability for non-ISDN bases. When a non-ISDN base attempts to use CFDCET with SS7 over a non-ISDN User Part (ISUP) trunk, the remote station does not block the call attempt as it does for an ISDN base. The base station reverts back to normal CFD processing and forwards the call regardless of the state of the remote station. The table that follows shows the interactions between agent type and trunk type.

Agent type and trunk interaction with trunk type CFDCET operation

Base station agent type	Trunk available	Operation
ISDN	ISUP (SS7)	Forward the call over the ISUP trunk if the remote DN is idle. Continue current treatment to the originator if the remote station is busy.
non-ISDN	ISUP (SS7)	Same operation as ISDN base and ISUP trunk.
ISDN	non-ISUP (SS7)	Continue current treatment to the originator. Do not forward the call over a non-ISUP trunk.
non-ISDN	non-ISUP (SS7)	Exit the CFDCET with SS7 feature and revert back to normal CFD operation. The system forwards the call over the non-ISUP trunk; the call can terminate to a busy DN. This result is identical to the result when the CFDCET option is OFF.
ISDN	No available trunks	Continue existing treatment to the originator.
non-ISDN	No available trunks	Same operation as ISDN base and ISUP trunk.

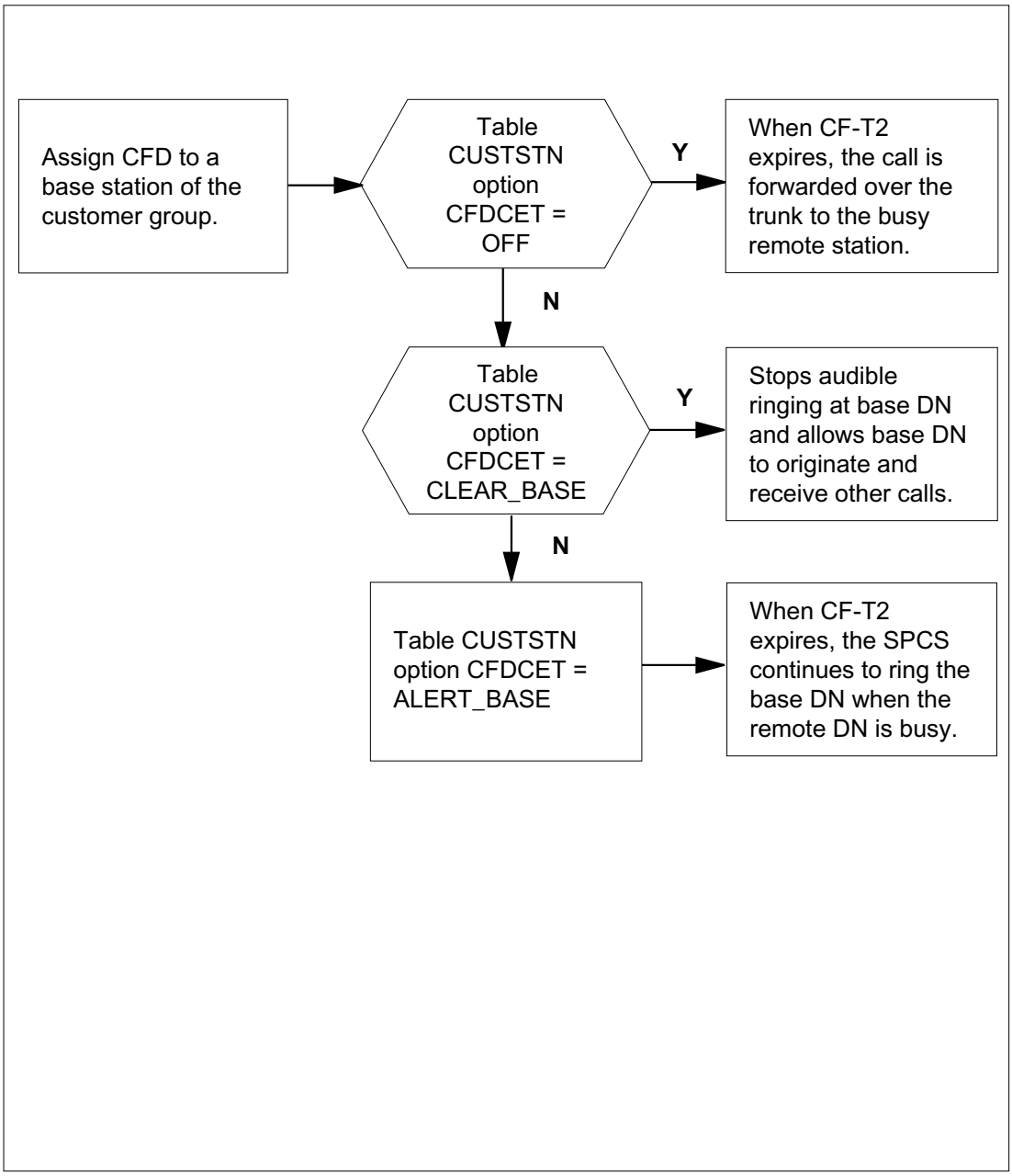
CFD Continue Existing Treatment Enhancements with SS7 (continued)

Translations table o w

Table CUSTSTN is the translations table for CFD Continue Existing Treatment Enhancements with SS7.

The flowchart that follows provides the CFD Continue Existing Treatment Enhancements with SS7 translations process.

Table o w for CFD Continue Existing Treatment Enhancements with SS7



CFD Continue Existing Treatment Enhancements with SS7 (continued)

The table that follows lists the datafill content used in the flowchart.

Data ll e xample for CFD Continue Existing Treatment Enhancements with SS7

Datafill table	Example data
CUSTSTN	IBNTEST CFDCET CFDCET ALERT_BASE

Limitations and restrictions

For CFD to forward over a trunk, one of the following must be true:

- The base station that has the CFD feature must also have the Call Forwarding Don't Answer Unrestricted (CDU) feature.
- The forwarding trunk must have the value for subfield INTRAGRP in table IBNXLA set to Y (yes).

The limitations and restrictions that follow apply to CFD Continue Existing Treatment Enhancements with SS7:

- A base station of the customer group must have CFD for the CFDCET with SS7 feature to work for that base station. The CFDCET with SS7 feature applies only to base stations that CFD forward their calls over an SS7 trunk to a remote station.
- Call Forward Call Waiting (CFCW) on 2500/500 sets does not act on this feature. If CFCW is enabled on a 2500/500 set and the CFCW timer expires after call-waiting notification, the system forwards the call over the ISUP trunk without the use of CFDCET with SS7. This condition is like normal CFD operation. It is possible to forward to a busy remote with CFCW active on a 2500/500 set.
- If an attendant console calls the base directly or extends a call to the base, the SPCS forwards the call over the ISUP trunk without the use of CFDCET with SS7. This condition is like normal CFD operation. It is possible to forward to a busy remote when the call originates from an attendant console.
- If a base station CFD forwards to an E800 DN, the system does not activate the CFDCET with SS7 feature. Instead the switch forwards the call with normal CFD. This restriction occurs because the base station forwards to an E800 number (which is not over an ISUP trunk) before the E800 service determines that the DN requires a route over an ISUP trunk. It is possible to forward to a busy remote when the remote DN is an E800 DN.
- With this feature active, if different users seize the the selected trunk member at the same time, no retry is made. Instead the call forward fails, and the base station continues to ring if the CFDCET option is

CFD Continue Existing Treatment Enhancements with SS7 (continued)

ALERT_BASE. If the CFDCET option is CLEAR_BASE, the system clears the base.

- When the CFDCET option is ALERT_BASE, operation is different from normal intra-switch CFD processing. Normal intra-switch CFD processing continues to poll a busy remote station. When the remote station becomes idle, the switch forwards the call. Inter-switch operation with the CFDCET option set to ALERT_BASE makes one attempt to forward over the trunk. If the remote station is busy, the base continues to ring without polling for an idle remote station.
- GR-853 defines inter-switch originator and base with intra-switch base and remote operation. This operation is not compliant because this activity does not modify the intra-switch functionality.
- When the base station is a Simultaneous Ringing (SimRing) pilot or member and uses an ISUP trunk with option CFDCET set to CLEAR_BASE or ALERT_BASE, the system forwards the call over the ISUP trunk without CFDCET with SS7. This condition is like normal CFD operation. It is possible to forward to a busy remote when the call originates from a SimRing pilot or member.
- After the attempt to forward to a busy remote station with option CFDCET set to CLEAR_BASE, the system does not generate ringing timeout logs (LINE 160 INFO RINGING) when it clears a base station. The switch drops the call when the ringing timeout occurs, but the system does not generate the log. The system only generates LINE 160 logs when the base releases the ringing set. In this instance, the originator gets audible ringing, but the base station does not ring.

Interactions

This feature works with other features in the same manner that CFD works with other features except as described in the Limitations and restrictions section of this document.

Activation and deactivation by the user

CFD Continue Existing Treatment Enhancements with SS7 does not require activation or deactivation by the user.

Billing

CFD Continue Existing Treatment Enhancements with SS7 does not generate billing records or changes.

Station Message Detail Recording

CFD Continue Existing Treatment Enhancements with SS7 does not require Station Message Detail Recording.

CFD Continue Existing Treatment Enhancements with SS7 (continued)

Of ce parameter s used by CFD Continue Existing Treatment Enhancements with SS7

CFD Continue Existing Treatment Enhancements with SS7 does not generate office parameters.

Data ll sequence

The table that follows lists the table that requires datafill to put CFD Continue Existing Treatment Enhancements with SS7 into operation.

Data ll requirements f or CFD Continue Existing Treatment Enhancements with SS7

Table	Purpose of table
CUSTSTN	Customer Station table contains a list of options for each customer group.

Data ll related to CFD Contin ue Existing Treatment Enhancements with SS7 for table CUSTSTN

The table that follows provides the datafill related to CFD Continue Existing Treatment Enhancements with SS7 for table CUSTSTN. This table includes only those fields that apply directly to CFD Continue Existing Treatment Enhancements with SS7.

Data ll related to tab le CUSTSTN (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
CUSTNAME		alphanumeric (1 to 16 characters)	Customer group name. This field indicates the 1-character to 16-character alphanumeric name for the customer group. Enter the customer group name.
OPTNAME		CFDCET	Option name. Add option CFDCET to the list of available options.
OPTION		see subfield	Option. This field contains subfield OPTION.

CFD Continue Existing Treatment Enhancements with SS7 (end)

Data ll related to tab le CUSTSTN (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	OPTION	CFDCET	Option. Enter the name assigned to the option, CFDCET.
	CFDCETO	OFF, ALERT_BASE, CLEAR_BASE	Call forwarding don't answer continue existing treatment option. This subfield determines how the system uses continue existing treatment. Enter one of the following: OFF—This state disables the CFDCET with SS7 feature. ALERT_BASE—This state enables the CFDCET with SS7 feature to operate in a way that continues to ring the base station when the remote DN is busy. CLEAR_BASE—This state enables the CFDCET with SS7 feature to stop audible ringing at the base station and to allow the base station to originate and receive other calls when the remote DN is busy.

Data ll e xample for table CUSTSTN

The figure that follows shows sample datafill for table CUSTSTN.

MAP example for table CUSTSTN

```
TABLE:  CUSTSTN

CUSTNAME  OPTNAME                              OPTION
-------------------------------------------------------
IBNTST    CFDCET                         CFDCET  ALERT_BASE
```

Translation veri cation tools

CFD Continue Existing Treatment Enhancements with SS7 does not use translation verification tools.

SERVORD

CFD Continue Existing Treatment Enhancements with SS7 does not use the Service Order System (SERVORD).

CNIS Billing without Intra/Inter BBG Segregation

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA010 and up

CNIS Billing without Intra/Inter BBG Segregation was introduced in NA010.

Prerequisites

This document includes all the data table information for this functionality. Complete use of this functionality can require software or hardware not described in this document.

Description

Calling Number Identification Service (CNIS) Billing creates two options that allow operating companies to generate automatic message accounting (AMA) billing records for integrated services digital network (ISDN) basic rate interface (BRI) call information:

- Privacy Change Allowed (PCA) detailed billing
- Calling Number Delivery (CND)/Calling Name Delivery (CNAMD) aggregate billing based on call type

These two options represent extensions of CLASS features that generate AMA billing records.

The Detailed Privacy Change Allowed Recording (DPCAR) Service Order System (SERVORD) option generates PCA billing information for ISDN BRI directory numbers (DNs) that have the Privacy Change Allowed Caller ID Delivery and Suppression (PCACIDS) feature assigned.

The Aggregate CND Recording (ACR) option facilitates separate peg counts of voiceband information (VI) and circuit-mode data (CMD) calls. Option ACR allows operating companies to generate these counts for any ISDN BRI DN that has the CND feature installed.

For more information about the PCACIDS and CND features, see “ISDN Calling Number Delivery/Name and Number Privacy" in this document.

CNIS Billing without Intra/Inter BBG Segregation (continued)

Operation

Both CNIS billing options produce AMA records that enhance the AMA records produced by existing CLASS features. Option DPCAR, in conjunction with the PCACIDS feature, facilitates production of the same AMA records as CLASS features Calling Name/Number Delivery (CNND) and Calling Name/Number Blocking (CNNB). Unlike CNND/CNNB, however, DPCAR also appends an ISDN-specific module code 071 that indicates if the call type is VI or CMD.

The SERVORD line option ACR enhances the AMA records produced by CLASS features CND and CNAMD. Billing for CND/CNAMD records the number of available CND/CNAMD deliveries and the number of CND/CNAMD deliveries that are not available. For ISDN BRI, line option ACR expands the aggregate available/unavailable counts to differentiate between VI and CMD calls.

Detailed Privacy Change Allowed Recording (DPCAR)

The PCA feature provides the operating company the ability to permit or deny the use of the presentation indicator (PI). PI values stored on the switch can be datafilled

- according to the DN by using the SUPPRESS line option
- for a group of DNs by using the SUPPRESS DNGRPS line option

The PCACIDS feature allows users to provide their own PI values instead of relying on the operating company to provide this information. PCACIDS does not produce AMA records. SERVORD option DPCAR produces AMA records if the customer premises equipment (CPE) PI value contradicts the value stored on the switch.

Use the SUPPRESS line option to enter the PI values stored on the switch for each DN. Or use option SUPPRESS DNGRPS to enter values for a group of DNs. To determine if the PI values differ, DPCAR compares the user PI value with the DN suppression value of the public network.

Billing for option DPCAR occurs when the originating call with option DPCAR terminates to the called DN. But billing occurs before routing, ensuring that billing occurs only for correctly dialed digits.

Option DPCAR produces records like the AMA records produced by CLASS features CNND and CNNB. Calling Identity Delivery and Suppression Delivery (CIDSDLV) and Calling Identity Delivery and Suppression Suppression (CIDSSUP) are the ISDN BRI versions of CNND and CNNB. The AMA records produced by DPCAR use only class feature 085. The

CNIS Billing without Intra/Inter BBG Segregation (continued)

DPCAR feature appends an additional ISDN-specific module code 071 to these AMA records to differentiate between voice and data calls.

Aggregate CND Recording (ACR)

When assigned to an ISDN BRI LTID in conjunction with CND, SERVORD option ACR differentiates between VI and CMD call-type counts. ACR does not affect normal Residential Enhanced Services (RES) or Integrated Business Network (IBN) counts for CND or CNAMD.

ACR billing separation allows the operating company to track and bill the CND feature for ISDN BRI agents based on call type. The ACR feature produces two CND billing records with the following counts:

- VI counts appended with the ISDN module code 071 specifying voice
- CMD counts appended with the ISDN module code 071 specifying CMD

The bearer capability field in module code 071 shows the call type. A value of 101 in this field indicates voice; a value of 203 indicates CMD.

Option ACR uses a different method to peg the counts when both CND and CNAMD are active for the DN. Two additional counts are needed to handle the four possible conditions when

- both a calling name and a calling number are delivered
- neither a calling name nor a calling number is delivered
- only a calling name (but no calling number) is delivered
- only a calling number (but no calling name) is delivered

Translations table o w

The following list describes the CNIS Billing without Intra/Inter BBG Segregation translations tables:

- Table AMAOPTS controls the activation and scheduling of the recording options for AMA. Set field SUSP to ON for subscriber usage-sensitive pricing (SUSP). Field CIDSUSPAUD controls the calling information delivery (CID) SUSP audit that generates billing records for CND and CNAMD.
- Table KSETLINE contains the DN appearances for business sets and data units. Each DN-related key on a business set and a data unit requires one entry. When SERVORD adds new options to a business set, it updates this table automatically. Field DNRESULT, subfield OPTLIST is datafilled with ACR.

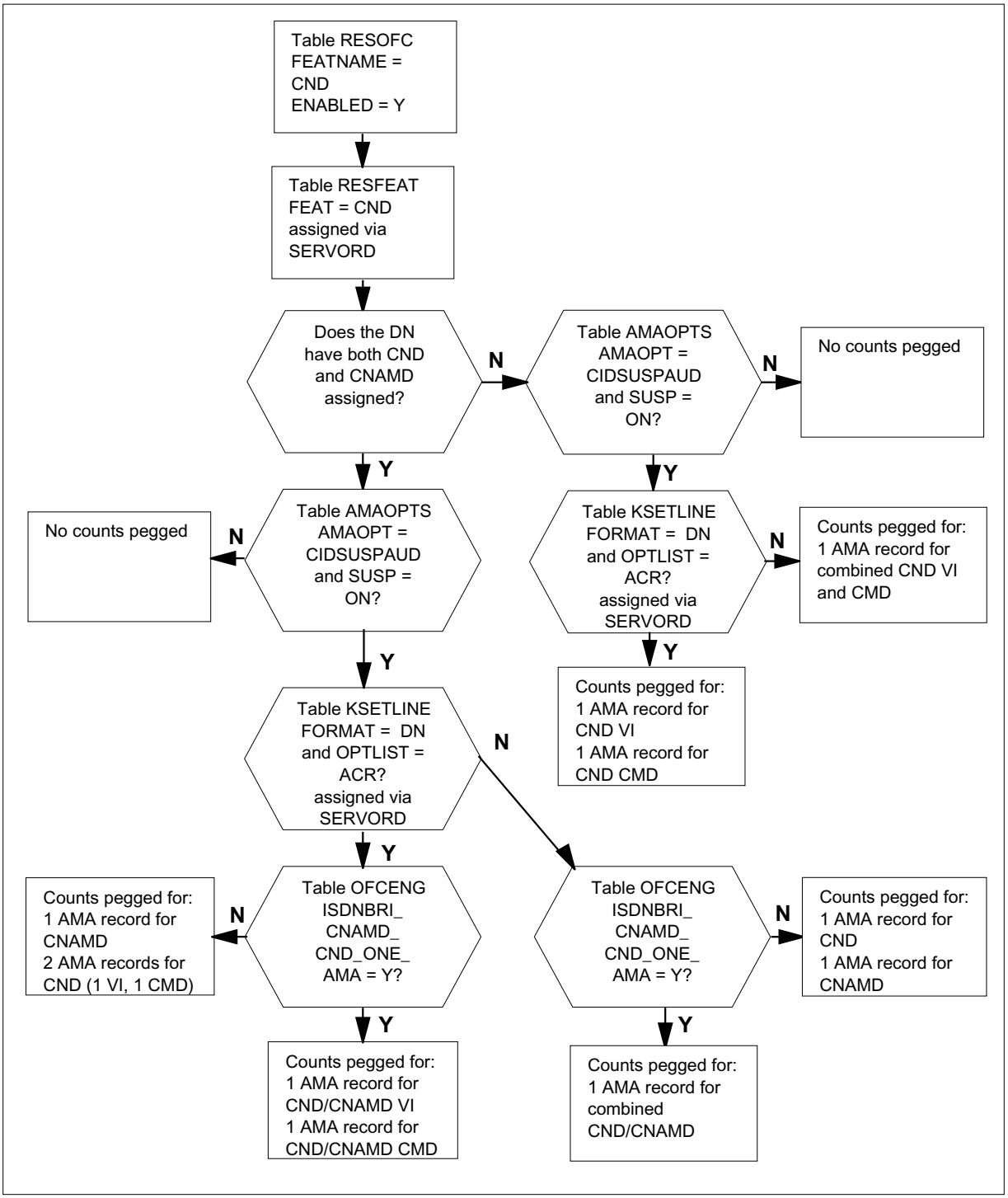
CNIS Billing without Intra/Inter BBG Segregation (continued)

- Table OFCENG contains data on engineering parameters for the office. The operating company can use office parameter ISDNBRI_CNAMD_CND_ONE_AMA to generate one or two AMA records. This option is available when both CND and CNAMD are assigned on an SUSP basis and both features are active. When set to Y, the switch generates one AMA record. When set to N (the default value), the switch generates two AMA records.
- Table RESFEAT contains the assignment of CLASS features for residential lines. SERVORD automatically updates this table when it assigns CND to the DN. Field FEAT equals CND or CNAMD, or both.
- Table RESOFC controls the activation of CLASS features for a whole office. Disable the feature here and no CLASS line can use the feature even if it is assigned.

The CNIS Billing without Intra/Inter BBG Segregation translation process is shown in the flowcharts that follow.

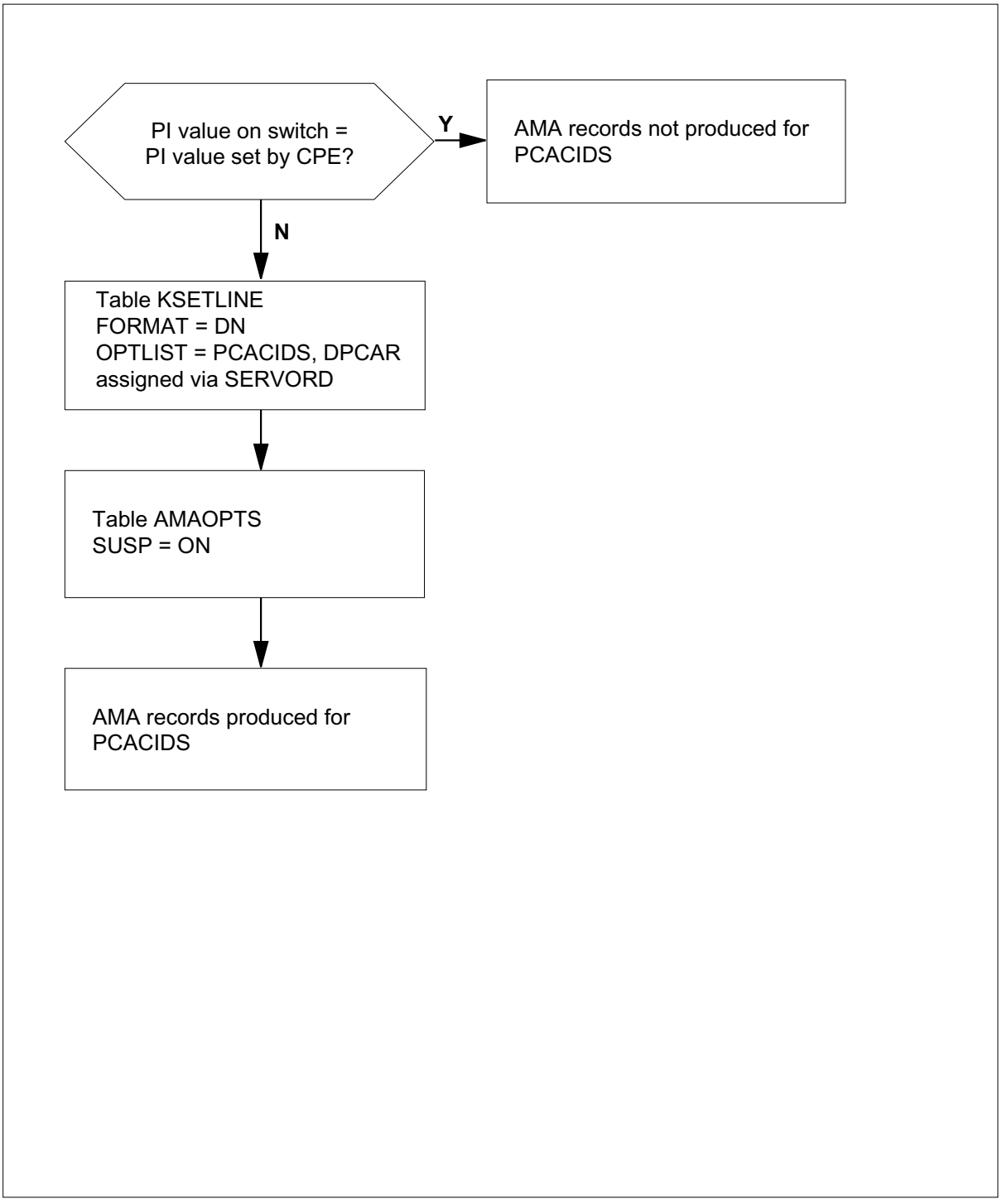
CNIS Billing without Intra/Inter BBG Segregation (continued)

Table o w for option ACR



CNIS Billing without Intra/Inter BBG Segregation (continued)

Table o w for option DPCAR



CNIS Billing without Intra/Inter BBG Segregation (continued)

The following table lists the datafill content used in the flowchart.

Data Il e xample for CNIS Billing without Intra/Inter BBG Segregation

Datafill table	Example data
AMAOPTS	CIDSUSPAUD PERIODIC 980524 0000 1 HRSSUSP ON
KSETLINE	WITS 2 1 DN Y 6215982 IBNTST 0 0 613 PCACIDS DPCAR ACR $
OFCENG	ISDNBRI_CNAMD_CND_ONE_AMA Y
RESFEAT	ISDN 20 1 CND CND AMA ACT 0 0 0 0
RESOFC	CND Y SUBSCR CND SINGLE $

Limitations and restrictions

The following limitations and restrictions apply to CNIS Billing without Intra/Inter BBG Segregation:

- CNIS billing does not produce AMA records for redirecting number delivery billing.
- ACR does not distinguish between inter-basic business group (BBG) and intra-BBG calls.
- ACR does not distinguish between interstate calls and calls within a state.
- ACR does not perform billing or keep billing counts. ACR only causes any billing or counts to be separated by call type. The CND option also must be active to use the ACR feature.
- The CMD counts for CND and CNAMD are used only for ISDN BRI billing. ACR does not affect the RES/IBN CLASS CND and CNAMD counts.
- DPCAR only generates AMA records if the PI value sent to the switch contradicts the value held by the switch.

Interactions

The following paragraph describes the interactions between CNIS Billing without Intra/Inter BBG Segregation and other functionalities.

CIDSSUP/CIDSDLV

When billing occurs through option DPCAR and also through CIDSSUP or CIDSDLV, the billing for CIDSSUP/CIDSDLV takes precedence over PCA features. In this instance, option DPCAR does not produce billing records.

CNIS Billing without Intra/Inter BBG Segregation (continued)

Activation/deactivation by the end user

CNIS Billing without Intra/Inter BBG Segregation does not require activation or deactivation by the end user.

Billing

CNIS Billing without Intra/Inter BBG Segregation does not implement any new billing records or change any current billing records. Instead, this feature specifies new instances when current billing records must include the ISDN core module code 071 to

- generate AMA records for the existing ISDN BRI option PCACIDS
- produce more detailed AMA records from existing records by using the ACR line option in conjunction with CND/CNAMD

DPCAR

The CLASS features CNND and CNNB generate AMA records when the privacy value from the CPE contradicts the value held by the switch. Option DPCAR appends the CNND/CNNB AMA record with ISDN module code 071 to indicate if the call type is VI or CMD. The AMA record produced by DPCAR has structure code 1030, call type 330, and feature code 085.

The following conditions all must exist to generate the AMA Bellcore format records module code 071 for DPCAR:

- The Bellcore AMA package must be present in the office, and the office must use Bellcore AMA format records.
- Enable SUSP billing in table AMAOPTS.
- PCACIDS must be available in the office.
- Assign PCACIDS to the line, and set to Y.
- The privacy value sent in from the CPE must contradict the privacy value that is now datafilled on the switch.
- Assign option DPCAR to the DN through SERVORD. SERVORD automatically fills the OPTION field in table KSETLINE.

The following figure is an example AMA record generated for call code 330 for activation of option DPCAR for voice data. The bearer capability value of 101 indicates voice data.

CNIS Billing without Intra/Inter BBG Segregation (continued)

Call code 330

```
HEX ID:AA STRUCTURE CODE:41030C CALL CODE:330C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFC TYPE:036C REC OFC
ID:0619351C DATE:71201C CLASS FEATURE:085C ORIG NPA:613C
ORIG NUMBER:6215989C OVERSEAS IND:1C TERM NPA:00613C TERM
NUMBER:6215004C CONNECT TIME:1420112C ELAPSED
TIME:000000000C CLASS FUNCTION:000C FEATURE STATUS:000C
SCRN LIST SCF:FFFF SCRN LIST SCR:FFFF SCRN LIST DRCW:FFFF
MODULE CODE:071C BEARER CAPABILITY:101C NETWORK
INTERWORKING:0C RELEASE CAUSE INDICATOR:00016C MODULE
CODE:000C
```

The following figure is an example AMA record generated for call code 330 for activation of option DPCAR for CMD. The bearer capability value (in this example the value is 203) indicates CMD.

Call code 330

```
HEX ID:AA STRUCTURE CODE:41030C CALL CODE:330C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFC TYPE:036C REC OFC
ID:0619351C DATE:71201C CLASS FEATURE:085C ORIG NPA:613C
ORIG NUMBER:6215989C OVERSEAS IND:1C TERM NPA:00613C TERM
NUMBER:6215004C CONNECT TIME:1420112C ELAPSED
TIME:000000000C CLASS FUNCTION:000C FEATURE STATUS:000C
SCRN LIST SCF:FFFF SCRN LIST SCR:FFFF SCRN LIST DRCW:FFFF
MODULE CODE:071C BEARER CAPABILITY:203C NETWORK
INTERWORKING:0C RELEASE CAUSE INDICATOR:00016C MODULE
CODE:000C
```

ACR

The ACR feature causes the existing CND/CNAMD peg count to be produced twice, one time for each call type. The appended ISDN module code 071 indicates if the call type is VI or CMD. Separate counts allow operating companies to track the CND/CNAMD features for ISDN BRI agents according to call type.

For ISDN BRI lines with SUSP CND, but not assigned SUSP CNAMD, the billing record has structure code 110 and CLASS feature code 080. The billing record includes the AVAIL and UNAVAIL counts for CND.

CNIS Billing without Intra/Inter BBG Segregation (continued)

The peg counts for the CLASS display features appear as follows:

- The AVAIL count stores the number of times the switch delivered a calling number for the DN.
- The UNAVAIL count stores the number of times the switch delivered out-of-area or private for the DN.

These conditions are required to produce module code 071 with ACR counts for subscribers with CND assigned to the line:

- The Bellcore AMA package is present in the office.
- SUSP billing is enabled in table AMAOPTS.
- CND with AMA is active for the line.
- ACR is active for the LTID (assigned by SERVORD).
- CND is enabled in table RESOFC.
- CND is enabled on the line.
- The CIDSUSPAUD entry in table AMAOPTS is scheduled.
- The office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG equals N (No), or CNAMD is not present, or both.

The following figure is an example of an AMA record generated for call code 264 for activation of option ACR. This figure shows option ACR used in conjunction with CND for voice data. The bearer capability value of 101 in module code 071 indicates voice data.

Call code 264

```
HEX ID:AA STRUCTURE CODE:40110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0000000C RES OFC TYPE:036C REC OFC
ID:0000000C CLASS FEATURE:080C DATE:92519C CONNECT
TIME:1049386C NPA:819C DIR NUMBER:6221999C AVAIL COUNT:
000026C UNAVAIL COUNT:000005C MODULE CODE:071C BEARER
CAPABILITY:101C NETWORK INTERWORKING:0C RELEASE CAUSE
INDICATOR:00016C MODULE CODE:000C
```

The following figure is an example of an AMA record generated for call code 264 for activation of option ACR. This figure shows option ACR used in conjunction with CND for CMD. The bearer capability value of 203 in module code 071 indicates CMD.

CNIS Billing without Intra/Inter BBG Segregation (continued)

Call code 264

```
HEX ID:AA STRUCTURE CODE:40110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0000000C RES OFC TYPE:036C REC OFC
ID:0000000C CLASS FEATURE:080C DATE:92519C CONNECT
TIME:1049386C NPA:819C DIR NUMBER:6221999C AVAIL
COUNT:000026C UNAVAIL COUNT:000005C MODULE CODE:071C
BEARER CAPABILITY:203C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:000C
```

Set office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG to Y to generate combined CNAMD/CND AMA records for ISDN BRI lines assigned both SUSP CND and SUSP CNAMD. For this condition, the billing record has structure code 110 and Custom Local Area Signaling Services (CLASS) feature code 087. Also included in the combined AMA record is the module code 049 information appended to the 110 record. In this event, two sets of AVAIL and UNAVAIL counts are included in the AMA record.

The peg counts for the CLASS display features appear as follows:

- The first AVAIL count shows the number of times the switch delivered both a calling name and a calling number.
- The first UNAVAIL count shows the number of times the switch delivered neither a calling name nor a calling number.
- The second (049 section) AVAIL count shows the number of times the switch delivered a calling name but no calling number (CNAMD-only deliveries).
- The second (049 section) UNAVAIL count shows the number of times the the switch delivered a calling number but no calling name (CND-only deliveries).

To produce call type-specific AMA records for BRI subscribers with both SUSP CNAMD and SUSP CND (feature code 087):

- The Bellcore AMA package must be present in the office.
- Enable SUSP billing in table AMAOPTS.
- Assign both CNAMD and CND with AMA to the line.
- Assign ACR to the LTID through SERVORD.
- CNAMD and CND must be enabled in table RESOFC.
- CNAMD and CND must be enabled for the subscriber.

CNIS Billing without Intra/Inter BBG Segregation (continued)

- Schedule the CIDSUSPAUD entry in table AMAOPTS.
- Set the office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table OFCENG to Y (Yes) to produce combined AMA records for CND/CNAMD. A value of N (No) for this parameter results in a single CNAMD record and separate CND records for voice and data.

The following figure is an example of an AMA record generated for call code 264 for activation of option ACR. This figure shows the AMA record produced by ACR in conjunction with both CND and CNAMD for voice data.

Call code 264

```
HEX ID:AA STRUCTURE CODE:40110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0000000C RES OFC TYPE:036C REC OFC
ID:0000000C CLASS FEATURE:087C DATE:92519C CONNECT
TIME:1049386C NPA:819C DIR NUMBER:6221999C AVAIL COUNT:
000026C UNAVAIL COUNT:000005C MODULE CODE:049C AVAIL
COUNT:000028C UNAVAIL COUNT:000003C MODULE CODE:071C
BEARER CAPABILITY:101C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:000C
```

The following figure is an example of an AMA record generated for call code 264 for activation of option ACR. This figure shows the AMA record produced by ACR in conjunction with both CND and CNAMD for CMD.

Call code 264

```
HEX ID:AA STRUCTURE CODE:40110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0000000C RES OFC TYPE:036C REC OFC
ID:0000000C CLASS FEATURE:087C DATE:92519C CONNECT
TIME:1049386C NPA:819C DIR NUMBER:6221999C AVAIL COUNT:
000026C UNAVAIL COUNT:000005C MODULE CODE:049C AVAIL
COUNT:000028C UNAVAIL COUNT:000003C MODULE CODE:071C
BEARER CAPABILITY:203C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:000C
```

Station Message Detail Recording

CNIS Billing without Intra/Inter BBG Segregation does not affect Station Message Detail Recording.

CNIS Billing without Intra/Inter BBG Segregation (continued)

Data lling of ce parameter s

The following table shows the office parameter used by CNIS Billing without Intra/Inter BBG Segregation. For more information about office parameters, refer to *Office Parameters Reference Manual*.

Of ce parameter used b y CNIS Billing without Intra/Inter BBG Segregation

Table name	Parameter name	Explanation and action
OFCENG	ISDNBRI_CNAMD_ CND_ONE_AMA	This parameter allows production of one or two records when both ISDN CND and CNAMD are active on a SUSP basis. If option ACR is also active, then the operating company can produce either two or three records. A value of Y results in two AMA records, one for combined CND/CNAMD voice and one for combined CND/CNAMD data. A value of N results in three AMA records, one normal CNAMD record, and two CND voice and data records.

Data ll sequence

The following table lists the tables that require datafill to implement CNIS Billing without Intra/Inter BBG Segregation. The tables are listed in the order in which they are to be datafilled.

Data ll tab les required for CNIS Billing without Intra/Inter BBG Segregation (Sheet 1 of 2)

Table	Purpose of table
AMAOPTS	Automatic Message Accounting Options. Use this table to control the activation and scheduling of the recording options for AMA. Enable SUSP for line options ACR and DPCAR. Enable CIDSUSPAUD for option ACR.
KSETLINE (Note)	Business Set and Data Unit Line Assignment. This table contains the DN appearances for business sets and data units. Table KSETLINE requires one entry for each DN-related key on a business set and a data unit. SERVORD automatically updates this table when it adds new options to a business set. The line options PCACIDS, DPCAR, and ACR are datafilled here.
OFCENG	Office Engineering. This table contains data on engineering parameters for the office. Refer to “Datafilling office parameters" for how office parameters affect ACR.
Note: SERVORD automatically datafills this table. Therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.	

CNIS Billing without Intra/Inter BBG Segregation (continued)

Data ll tab les required for CNIS Billing without Intra/Inter BBG Segregation (Sheet 2 of 2)

Table	Purpose of table
RESFEAT (Note)	Residential Enhanced Services Features. This table contains the assignment of CLASS features for residential lines. SERVORD automatically updates each DN that has ACR assigned to it. Assign the billing option here. Assign the line options CND and CNAMD here.
RESOFC	Residential Line CLASS Office Data. This table contains data on CLASS features and activates them for the office. CND is enabled in the CND tuple for the office.
Note: SERVORD automatically datafills this table. Therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.	

Data lling tab le AMAOPTS

The following table shows the datafill related to CNIS Billing without Intra/Inter BBG Segregation for table AMAOPTS. Only fields that apply directly to CNIS Billing without Intra/Inter BBG Segregation are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le AMAOPTS (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
OPTION		see subfield	*Option.* This field consists of subfield AMAOPT.

CNIS Billing without Intra/Inter BBG Segregation (continued)

Data lling tab le AMAOPTS (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	AMAOPT	CIDSUSPAUD	*AMA option.* This option controls the calling information delivery (CID) SUSP audit that generates billing records for each CND or CNAMD feature subscriber. The billing records contain peg counts for each of the CLASS SUSP display options.
		SUSP	If option SUSP is OFF (the default) • no SUSP billing occurs • SERVORD suppresses prompting for SUSP If option SUSP is ON • SERVORD prompting for BILLING_OPTION is enabled • SUSP billing is enabled for the office (and SUSP billing takes place on lines that have the AMA BILLING_OPTION)

Data ll e xample for table AMAOPTS

The following example shows sample datafill for table AMAOPTS. SUSP must be ON for DPCAR/PCACIDS to generate detailed PCA call information. CIDSUSPAUD must be ON and SUSP must have been ON during the audit period to generate ACR records.

MAP display example for table AMAOPTS

```
OPTION          SCHEDULE
-------------------------------------------------------
SUSP            ON
CIDSUSPAUD      PERIODIC
AMASEL          PERIODIC
ONDATE          980524
ONTIME          0000
TV              1
TU              HRS
```

CNIS Billing without Intra/Inter BBG Segregation (continued)

Data lling tab le RESOFC

The following table shows the datafill related to CNIS Billing without Intra/Inter BBG Segregation for table RESOFC. Only fields that apply directly to CNIS Billing without Intra/Inter BBG Segregation are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le RESOFC

Field	Subfield or refinement	Entry	Explanation and action
KEY		see subfield	*Key.* This field consists of subfield FEATNAME.
	FEATNAME	CNAMD, CND	*Class feature name.* This field is the key to the table. Enter CND for the CND feature or enter CNAMD for the CNAMD feature.
ENABLED		Y or N	*Enabled.* Enter Y (yes) to specify that the feature is enabled within the office. Enter N (no) to disable the feature.
FEATDATA		see subfield	*Feature data.* This field consists of subfield FEATNAME.
	FEATNAME	CNAMD, CND	*Class feature name.* Enter CNAMD for the CNAMD feature. Enter CND for the CND feature and datafill refinement CND_MSGTYPE.

Data ll e xample for table RESOFC

The following example shows sample datafill for table RESOFC.

MAP display example for table RESOFC

```
KEY          ENABLED          FEATDATA          FNALANN
-------------------------------------------------------
CND            Y              SUBSCR CND          $
```

CNIS Billing without Intra/Inter BBG Segregation (continued)

SERVORD

Use the ADO (add option) command to assign the DPCAR and ACR line options to LTIDs for each DN. You can assign option DPCAR to any DN that has earlier been assigned the PCACIDS line option. Or use the ADO command to assign options DPCAR and PCACIDS at the same time. Use the ADO command to assign option ACR to any DN that has earlier been assigned the CND line option. Or use the ADO command to assign options DPCAR and PCACIDS at the same time.

Use the NEW (establish service) command to assign option DPCAR to any DN to which you add PCACIDS at the same time. Or use the NEW command to assign option ACR to any DN to which you assign the CND line option.

Remove option DPCAR or option ACR from the DN by the DEO (delete option) command or through the OUT (remove service) command. The OUT command removes the option automatically.

SERVORD limitations and restrictions

Removal of option PCACIDS through any means also removes option DPCAR. Removal of option CND through any means also removes option ACR.

SERVORD prompts

The following table shows the SERVORD prompts used to assign CNIS Billing without Intra/Inter BBG Segregation to an ISDN BRI line.

SERVORD prompts for CNIS Billing without Intra/Inter BBG Segregation

Prompt	Valid input	Explanation
DN	7 or 10 digits (with no spaces or hyphens)	Specifies the directory number
OPTION	ACR, DPCAR	Option(s) associated with a service that you establish, modify, or delete. Specify a maximum of 20 options in any single command.
OPTKEY	1 to 69	Key associated with the option

Note: SERVORD automatically updates a separate tuple in table RESFEAT when it assigns CND to each DN. SERVORD automatically updates a tuple in table KSETLINE when it assigns options PCACIDS, ACR, or DPCAR.

CNIS Billing without Intra/Inter BBG Segregation (continued)

SERVORD example for adding the DPCAR line option

The following SERVORD example shows how to add the DPCAR line option for an ISDN BRI line with the ADO command. Assign option PCACIDS to key 1 before you add option DPCAR, or add both options at the same time. In this example, option PCACIDS was added to the DN earlier.

SERVORD example for DPCAR in prompt mode

```
> ADO
SONUMBER:   NOW 96 7 1 PM
>
DN:
> 6755000
OPTKEY:
> 1
OPTION:
> DPCAR
OPTKEY:
> $
```

SERVORD example for DPCAR in no-prompt mode

```
> ADO $ 6755000 1 DPCAR $
```

SERVORD example for adding the ACR line option

The following SERVORD example shows how to add option ACR for an ISDN BRI line with the ADO command. Assign option CND to key 1 before you add option ACR or add both options at the same time. In this example, option CND was added to the DN earlier.

CNIS Billing without Intra/Inter BBG Segregation (end)

SERVORD example for ACR in prompt mode

```
> ADO
SONUMBER:   NOW 96 7 1 PM
>
DN:
> 6755000
OPTKEY:
> 1
OPTION:
> ACR
OPTKEY:
> $
```

SERVORD example for ACR in no-prompt mode

```
> ADO $ 6755000 1 ACR $
```

DN Call Appearance Key Independence

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA011 and up

DN Call Appearance Key Independence was introduced in NA011.

Prerequisites

This document includes all the data table information for this functionality. Complete use of this functionality can require software or hardware not described in this document.

Description

Presently the number of directory number (DN) appearances for non-Multiple Appearance Directory Number (MADN) DNs is equal to the sum of the values assigned for the Call Reference Busy Limit (CRBL) option. The CRBL option allows the subscriber to limit the number of active calls for voiceband information (VI) and circuit-mode data (CMD).

DN Call Appearance Key Independence lets you indicate the number of DN appearances downloaded to National ISDN 2 (NI-2) sets by parameter downloading. This feature removes the link between the number of DN appearances and the CRBL values. DNs on NI-2 sets must have a number of key appearances that is less than or equal to the CRBL total. The number of key appearances must be at least one.

This feature introduces line option NDNAP (Number of DN Appearances). Option NDNAP configures the number of key appearances for the DN on the NI-2 set (up to the limit set by the CRBL total). The subscriber can continue to place the number of calls up to the limits set by the CRBL values.

The number of DN key appearances no longer has to match the CRBL value. The call limit does not change when the NDNAP value is lower than the CRBL total. DN Call Appearance Key Independence provides added flexibility to the user, who now has additional keys available for features.

DN Call Appearance Key Independence (continued)

Operation

DN Call Appearance Key Independence creates the following user interface changes:

- Option NDNAP sets the number of keys allocated to a DN on an NI-2 set.
- The QLT (query logical terminal) command response now includes NDNAP information.

Option NDNAP

Line option NDNAP indicates the number of key appearances for the NI-2 DN on the ISDN set. When the NDNAP value is smaller than the total CRBL value, the call limit does not change. The subscriber can continue to place the number of VI and CMD calls up to the CRBL limits.

For example, a subscriber can have a CRBL VI = 2, CRBL CMD = 2, yet have only two keys assigned on the set. The subscriber can continue to place four active calls.

The numbering of DN appearances sent by Parameter Downloading is in sequence. For example, if a DN on key 1 has NDNAP = 4, the set uses keys 1, 2, 3, and 4 for that DN. If NDNAP = 2, then the set uses only keys 1 and 2. If NDNAP = 2 and CRBL = 4, then the subscriber can choose to program two additional keys for the DN. For example, the subscriber can use keys 3 and 4 for features and put additional DN appearances on keys 10 and 11, .

Use the Service Order System (SERVORD) NEW command to add option NDNAP for the DN. Use the CHF (change feature information) command to change the value for option NDNAP. This feature includes an NDNAP prompt that allows the user to set the value for NDNAP.

QLT command

This feature changes the QLT display to show if the DN key has option NDNAP assigned. The new QLT display also shows the DBC value assigned to each DN-related key. The following figure shows the MAP display for the QLT command.

DN Call Appearance Key Independence (continued)

Example MAP display of the results of a QLT command entry

```
> QLT NI2 1
LTID:  NI2
SNPA:  613
DIRECTORY NUMBER:  7234201
LT GROUP NO:  15
LTCLASS:  BRAFS  DEFAULT LOGICAL TERMINAL:  N
EKTS:  N  CACH:  N
SLBRI:  N
CS:  NI2  PS:  N
ELN:  N
VERSION:  FUNCTIONAL ISSUE:  2
TSPID:          6137234201
LEN:  HOST  01 0 09 00   TEI:  DYNAMIC
CUSTGRP:          BNR  SUBGRP: 0  NCOS: 0  RING: Y
LINE CLASS CODE: ISDNKSET
MAXKEYS: 64
OPTIONS:
SFC VI $ $ N CMD BOTH $ $ N KSMOH
AR NOAMA $ CRBL 3 3 ACB NOAMA $ TRANSFER EXP CTALL DROP
FC 3
OFFICE OPTIONS:
AIN LNPOFFICE

KEY     DN                CALLTYPE
---     --                --------
  1     DN       7234201   VI & CM

KEY     FEATURE
---     -------
  1     AR NOAMA $
  1     ACOU 2 2
  1     CRBL 3 3
  1     DBC  DBC_SP
  1     NDNAP 3
  2     AFC  DBC_SP
  3     AFC  DBC_SP
  9     FC 3
 10     DROP
 11     TRANSFER  EXP  CTALL
 12     ACB NOAMA $
 24     RLS
```

Translations table o w

DN Call Appearance Key Independence does not affect translations table flow.

DN Call Appearance Key Independence (continued)

Limitations and restrictions

The following limitations and restrictions apply to DN Call Appearance Key Independence:

- Do not assign more DN appearances (NDNAP value) than the total of the CRBL values.
- For DNs assigned to EKTS CACH sets, do not assign an NDNAP value lower than the CRBL voiceband information (VI) value.

Interactions

The following paragraphs describe the interactions between DN Call Appearance Key Independence and other functionalities.

Set Up Logical Terminal (SLT)

Do not use the SLT command to assign CACH to an LTID unless the NDNAP value is greater than or equal to the CRBL VI value.

Multiple Appearance Directory Number (MADN)

SERVORD automatically assigns option NDNAP to the DN when you remove option MDN with the delete option (DEO) command. SERVORD automatically deletes option NDNAP from the DN when the user adds option MDN with the add option (ADO) command.

Activation/deactivation by the end user

DN Call Appearance Key Independence requires no activation or deactivation by the end user.

Billing

DN Call Appearance Key Independence does not affect billing.

Station Message Detail Recording

DN Call Appearance Key Independence does not affect Station Message Detail Recording.

Data lling of ce parameter s

DN Call Appearance Key Independence does not affect office parameters.

DN Call Appearance Key Independence (continued)

Data ll sequence

The following table lists the table that requires datafill to implement DN Call Appearance Key Independence.

Data ll tab le required for DN Call Appearance Key Independence

Table	Purpose of table
KSETFEAT	Business Set and Data Unit Feature. This table lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE, and also the Meridian digital telephone sets and DUs listed in table IVDINV. SERVORD automatically updates this table when it adds new options to a business set. SERVORD configures the line option NDNAP here. ***Note:*** SERVORD automatically datafills this table. Therefore, no datafill procedure or example is provided. Refer to "SERVORD" for an example of how to use SERVORD to datafill this table.

Translation veri cation tools

DN Call Appearance Key Independence does not use translation verification tools.

SERVORD

DN Call Appearance Key Independence uses SERVORD to add option NDNAP to an NI-2 set or to change its value.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to DN Call Appearance Key Independence:

- Option NDNAP can only be set to 1 for DNs in a hunt group.
- Option NDNAP is not compatible with options MDN, AFC, and NUMC.
- Option NDNAP does not require another option, but the NDNAP value is related to the values used for CRBL. Assign the value for NDNAP in the NEW command. If not, NDNAP automatically receives a value equal to the sum of the CRBL values.
- Options NDNAP and CRBL cannot both be changed in the same CHF command.

DN Call Appearance Key Independence (continued)

SERVORD prompts

The following table shows the SERVORD prompts used to assign DN Call Appearance Key Independence to an NI-2 LTID.

SERVORD prompts for DN Call Appearance Key Independence (Sheet 1 of 2)

Prompt	Valid input	Explanation
CMD	0 to 16	Indicates the number of active calls that can be assigned for the circuit-mode data (CMD) call type for the DN.
DN	7 or 10 digits entered with no spaces or hyphens	Directory number
GROUP	1 to 16 alphanumeric characters	The name of an IBN customer group.
KEY	1 to 69	The number of the key set to which the DN is assigned.
LATANAME	Alphanumeric	The calling local access and transport area (LATA) name for the originator of the call.
LCC_ACC	ISDNKSET	The line class code for the service to be established.
LEN_OR_LTID	Refer to LTID in this table for information on valid inputs.	The LTID of the DN to be changed or deleted.
LTG	0 to 9998 Default is 0.	The line treatment group.
LTID	An LTID consists of a logical terminal group name (LTGRP) of 1 to 8 alphanumeric characterers, a space, and a terminal number (1 to 1022).	The logical terminal identifier.
NCOS	0 to 511	The network class of service for IBN lines, trunks, or attendant consoles; defines a set of capabilities or restrictions that allows or denies calls.
NDNAP	1 to 32	The number of key appearances that the NI-2 ISDN DN occupies on an ISDN set.
OPTION	CRBL, NDNAP	The options associated with a service to be established, modified, or deleted.

DN Call Appearance Key Independence (continued)

SERVORD prompts for DN Call Appearance Key Independence (Sheet 2 of 2)

Prompt	Valid input	Explanation
OPTKEY	1 to 69	The key associated with the option.
RINGING	Y, N	Specifies whether a ring from a telephone speaker is required in addition to the call-waiting tone heard from the handset.
SNPA	3-digit number	The service numbering plan area (area code).
SUBGRP	0 to 7	The subgroup of a customer group to which a station or DN belongs.
VI	0 to 16	Indicates the number of active calls that may be assigned for the voiceband information (VI) call type for the DN.

SERVORD examples for adding DN Call Appearance Key Independence

The following SERVORD example shows how option NDNAP is added to a new DN using the NEW command.

DN Call Appearance Key Independence (continued)

xxSERVORD example of the NDNAP option in prompt mode

```
> NEW $
DN:
> 7231500
LCC_ACC:
> ISDNKSET
GROUP:
> BNR
SUBGRP:
> 0
NCOS:
> 0
SNPA:
> 613
KEY:
> 1
RINGING:
> Y
LATANAME:
> NILLATA
LTG:
> 0
LEN_OR_LTID:
> ISDN 200
OPTKEY:
> 1
OPTION:
> CRBL
VI:
> 2
CMD:
> 2
OPTKEY:
> 1
OPTION:
> NDNAP
NDNAP:
> 2
OPTKEY:
> $
```

DN Call Appearance Key Independence (end)

SERVORD example of the NEW command in no-prompt mode - adding NDNAP option

```
> NEW $ 7231500 ISDNKSET BNR 0 0 613 1 Y NILLATA 0 ISDN 200 1
CRBL 2 2 1 NDNAP 2 $
```

SERVORD examples for changing DN Call Appearance Key Independence

The following SERVORD example shows how the value of option NDNAP is changed for an existing DN using the CHF command.

xxSERVORD example of the CHF command in prompt mode - changing NDNAP option

```
> CHF
SONUMBER:     NOW  98 9 17 PM
>
DN_OR_LEN:
> ni2 1
OPTKEY:
> 1
OPTION:
> NDNAP
NDNAP:
> 3
OPTKEY:
$
```

SERVORD example of the CHF command in no-prompt mode - changing NDNAP option

```
> CHF $ NI2 1 NDNAP 3 $
```

Echo Station X.25 Loopback Testing

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA012 and up

NA012 introduced Echo Station X.25 Loopback Testing.

Requirements

Echo Station X.25 Loopback Testing has no functional group requirements.

Description

This feature allows the end user to test X.25 functionality. The user makes an X.25 packet call to an integrated services digital network (ISDN) X.25 DN that represents the echo station. Then the echo station echoes back the user data packets sent by the end user. Echo station is a software simulation of an ISDN set. The feature does not use any XMS-based peripheral module (XPM) or network interface unit (NIU) resources. Echo station requires an X.25 or X.75 link interface unit (XLIU).

The DMS switching system uses normal call establishment and clearing procedures for calls to an echo station. To the end user, no difference appears between the call establishment and clearing procedures for an echo station and those for another DN. This feature also includes a time-out facility for calls. If the length of an echo station call exceeds the time-out value provisioned for the echo station, the echo station clears the call.

This feature routes the call attempt through the network like a normal call. After call connection the user can transmit data packets to the echo station. The echo station extracts the contents of the user data field from the incoming data packet. The echo station then places those contents in the user data field of a new data packet. Finally, the echo station transmits the new data packet back to the user.

Operation

Currently, the DMS ISDN packet handler supports X.25 packet calls on the D-channel and B-channel of ISDN terminals. No facility exists for the end user to do loopback testing for an X.25 packet call. This feature allows an end user to check network connections for X.25 packet calls as described in Telecordia Technologies general requirement, GR2839.

Echo Station X.25 Loopback Testing (continued)

To begin an X.25 loopback test with the echo station, the user generates a call request packet. The called address is the E.164 address assigned to the echo station. The ISDN subsystem routes this call attempt through the network like a normal call. When the call request packet reaches the terminating switch, the switch recognizes the called address and routes the call request packet to the echo station. After call connection, the user transmits a data packet to the echo station.

The echo station performs the following functions as part of the X.25 packet call loopback testing:

- extracts the contents of the user data field from the incoming data packet
- places the contents of the user data field of the incoming data packet in the user data field of a new data packet
- transmits the new data packet back to the user on the same logical channel over which the original data packet traveled

The ISDN subsystem uses normal call clearing procedures to terminate a call to an echo station. If the duration of a call to an echo station exceeds the time-out value provisioned for the echo station, the echo station generates the call-clearing packet to clear the call. The echo station also supports some of the X.25 call related facilities.

ECHOCI commands

This feature introduces a command interface called ECHOCI that allows the user to provision the echo station. Type ECHOCI at the CI command level to access the ECHOCI environment. To exit the command interface, type “quit". The ECHOCI MAP level uses the following commands:

- ADD—used to provision an echo station DN on an XLIU service group
- REM—used to remove an echo station DN from service
- MOD—used to modify an echo station's parameters
- HELP—used with ADD, REM, or MOD commands to provide the user with an explanation of the command interface

Echo Station X.25 Loopback Testing (continued)

- HELP—used with the ECHOCI command to provide the user with an explanation of all ECHOCI commands
- QUIT—used to get out of the ECHOCI MAP level

ECHOCI level command parameters and variables

Parameter	Value	Description
LTID	LTGRP, LTNUM	LTGRP - enter the logical terminal group number. Non-SAPI groups can have any value between 0 and 31. SAPI groups must have a value between 0 and 15. LTNUM - enter the number for the LTID. This number (between 1 and 1022) identifies the logical terminal within the group.
DN	7 digits	Directory or line equipment number. Enter the directory number.
CUSTGRP	Characters and numbers (0 to 4095)	Customer group ID number. This parameter indicates the alphanumeric characters assigned to this IBN customer group.
SUBGRP	0 to 7	Subgroup number. Enter the customer subgroup number.
NCOS	0 to 511	Network class of service number. Enter a number to identify this NCOS.
NPA	3-digit string	Numbering plan area. The NPA is a 3-digit code commonly called the area code.
TIMEOUT	Y or N	Timeout facility. This boolean value allows or prohibits the timeout facility for calls to the echo station.
MINUTES	1 to 30	Timeout value. When the value of TIMEOUT is Y, enter the value for the timeout (in minutes).

ADD command

Use the ADD command to provision an echo station on a specified X.25 service group (XSG) or X.25 link interface unit (XLIU).

The following figure shows the MAP response to the ECHOCI ADD command. Verify that the LTID definition for the echo station exists in table LTDEF before you use the ADD command.

Echo Station X.25 Loopback Testing (continued)

MAP display of response to the ECHOCI ADD command

```
CI:
> echoci
Welcome to ECHOCI tool
Type HELP ECHOCI for help on ECHOCI tool.
ECHOCI:
> add
LTID:
> pkt 200
DN:
> 5551108
CUSTGRP:
> lons634
SUBGRP:
> 0
NCOS:
> 0
NPA:
> 613
TIMEOUT:
> y
MINUTES:
> 12
COMMAND AS ENTERED:
ADD PKT 200 5551108 LONS634 0 0 613 Y 12
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
> y
ECHO STATION LTID PKT  200  IS PROVISIONED.
WARNING:  Journal file inactive.
```

REM command

Use the REM command to remove the echo station DN. The following figure shows the MAP response to the ECHOCI REM command. Use the table editor to remove related tuples in tables LTMAP, DNCTINFO, and DNCHNL before you execute this command. The LTID specified for removal must be an echo station that was provisioned with the ADD command from the ECHOCI interface.

Echo Station X.25 Loopback Testing (continued)

MAP display of response to the ECHOCI REM command

```
CI:
> echoci
Welcome to ECHOCI tool
Type HELP ECHOCI for help on ECHOCI tool.
ECHOCI:
> rem
LTID:
> pkt 200
COMMAND AS ENTERED:
REM PKT 200
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
> y
ECHO STATION LTID PKT  200  DELETED.
WARNING:  Journal file inactive.
>
```

MOD command

Use the MOD command to modify important parameters of the echo station DN. The LTID specified for modification must be an echo station that was provisioned with the ADD command from the ECHOCI interface.

MAP display of response to the ECHOCI MOD command

```
CI:
> echoci
Welcome to ECHOCI tool
Type HELP ECHOCI for help on ECHOCI tool.
ECHOCI:
> mod
LTID:
> pkt 200
TIMEOUT:
> n
COMMAND AS ENTERED:
MOD PKT 200 N
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
> y
PARAMETERS CHANGED FOR ECHO STATION LTID PKT  200.
WARNING:  Journal file inactive.
>
```

Echo Station X.25 Loopback Testing (continued)

HELP command

Use the HELP command to obtain help for the ADD, REM, and MOD commands. The example that follows shows the HELP command display for ADD, REM, and MOD.

MAP display of response to the ECHOCI HELP command

```
CI:
> echoci
Welcome to ECHOCI tool
Type HELP ECHOCI for help on ECHOCI tool.
ECHOCI:
> help add
COMMAND ADD: PROVISIONS ECHO STATION DN/LTID
COMMAND FORMAT: ADD<LTID><DN><CUSTGRP><SUBGRP><NCOS>
 <NPA><TIMEOUT><MINUTES>

> help rem
COMMAND REM: DE-PROVISIONS ECHO STATION LTID/DN
COMMAND FORMAT: REM<LTID>

> help mod
COMMAND MOD: CHANGES ECHO STATION RELATED PARAMETERS FOR
             SPECIFIED LTID
COMMAND FORMAT: MOD<LTID><TIMEOUT><MINUTES>

> help quit
Parameter is: <nlevels| incrname | ALL>

ECHOCI:
>
> HELP ECHOCI
**** Tool to Provision Echo Station ****

COMMAND ADD: PROVISIONS ECHO STATION DN/LTID
            COMMAND FORMAT: ADD<LTID><DN><CUSTGRP>
             <SUBGRP><NCOS><NPA><TIMEOUT><MINUTES>

COMMAND MOD: CHANGES ECHO STATION RELATED PARAMETERS FOR
             SPECIFIED LTID
            COMMAND FORMAT: MOD<LTID><TIMEOUT><MINUTES>

COMMAND REM: DE-PROVISIONS ECHO STATION LTID/DN
             COMMAND FORMAT: REM<LTID>

QUIT: QUITS FROM ECHOCI
>
```

Echo Station X.25 Loopback Testing (continued)

Non-ECHOCI commands

QPHF

Use the QPHF command at the CI level to display the packet handler information about a DN. The output from this command consists of information about the X.25 facilities provisioned for the DN and associated call type in table DNCTINFO. Or the output consists of information about the X.25 facilities provisioned for the DN and associated channel type in table DNCHNL. Command output also shows the information of the LTID associated with this DN.

For an echo station DN, this command does not display channel information. Instead, the command output displays “echo station" beside the X.25 service group (XSG) number. If the echo station LTID is not mapped to an XSG, the command output includes a message to indicate that no mapping exists.

MAP display of response to the QPHF DN command

```
>QPHF DN

      DN INFORMATION (B Channel)
     ---------------------------
NUI: NO  FSA: NO  RCA: NO  TCN: NO  ICB: NO  FCPN: NO  RPOAB: NO
LCP: NO  CUGS: NO  OCB: NO  SLCN: 1  NPVC: 0  NOWI: 0  NNRC: 1
NOWO: 0  NDPS: NO  LLFSQ: N/A  N2: N/A  T3: N/A  LLWS: N/A  IMPS: 128
OMPS: 128  T1: N/A  T2: N/A  N1: N/A  DTCA: NO  IDTCA: 64000
ODTCA: 64000  IPLWS: 2  OPLWS: 2  PLSQ: MOD8  NDWS: NO  ICS: NO

MAPPING
-------
LTID: PKT 100
XSG: 100 ECHO STATION
TIMEOUT: NO  MINUTES: N/A

      CUG INFORMATION
      ---------------

TYPE: X25  DN: 6135551001
DNIC:2525  INTERLOCK: 0  IAB: NO  OAB: YES  INDEX: 0
```

QPHF with LTID option The QPHF command with the LTID option displays packet handler information about an LTID. This information includes

Echo Station X.25 Loopback Testing (continued)

the types of calls ongoing at that time, the layer 3 status, the DN, key number, XSG numbers, and other link information.

MAP display of response to the QPHF command with LTID option

```
>qphf ltid pkt 100

      LINK INFORMATION
     -----------------
       TYPE: X.25 B   LTID: PKT 100

MAPPING
-------
XSG: 100  ECHO STATION
TIMEOUT: NO  MINUTES: N/A
DN: 6135551001, KEY: 1

CALL INFORMATION
----------------

svc:  0 call
incoming svc:  0 call

Layer 3 link status: down
```

QPHF with XSG option The QPHF command with the XSG option displays all the channels that are mapped to the XSG. This command also displays other XSG information such as the number of links, maximum number of channels, and various channel information.

Echo Station X.25 Loopback Testing (continued)

MAP display of response to the QPHF command with XSG option

```
>qphf xsg 100

         XSG INFORMATION
        -----------------
XSG EXT INDEX: 100  CURRENT NUMBER OF LINKS: 8
XLIU INDEX: 0  MAXIMUM NUMBER OF CHANNELS: 30
XSG 100 IS AVAILABLE FOR USE BY AUTO RESOURCE ASSIGNMENT
NUMBER OF ECHO STATION: 1

MAPPING
-------
CHANNEL: 1 X.25 PB
CHANNEL: 2 X.25 PB
CHANNEL: 3 X.25 PB
CHANNEL: 4 X.25 PB
CHANNEL: 5 X.25 Bd
CHANNEL: 6 X.25 Bd
CHANNEL: 7 X.25 Bd
LTID: PKT 100 ECHO STATION
```

QPHF with XSG-ALL option The QPHF command with the XSG-ALL option displays all the channel objects associated with the indicated XSG and all link objects associated with those channel objects.

Echo Station X.25 Loopback Testing (continued)

MAP display of response to the QPHF command with XSG-ALL option

```
>qphf xsg 100 all

          MAPPINGS FOR XSG 100
         ---------------------

CHANNEL: 1 LTID: PKT 5 DN: 6135551105
         No active call(s) on this LTID.

CHANNEL: 2 LTID: PKT 6 DN: 6135551106
         No active call(s) on this LTID.

CHANNEL: 6

CHANNEL: 7 LTID: PKT 3 DN: 6135551103
         No active call(s) on this LTID.

CHANNEL: 8 LTID: PKT 4 DN: 6135551104
         No active call(s) on this LTID.

ECHO DATA: LTID: PKT 100 DN: 6135551022
         No active call(s) on this LTID.
```

The link object is a child object of the XSG object. If only an echo station children are present and no channel child is present within the XSG, an appropriate message displays. The MAP display that follows shows the output for the QPHF command with the XSG-ALL option when only the echo station child is present.

Echo Station X.25 Loopback Testing (continued)

MAP display of response to the QPHF command with XSG-ALL option

```
>qphf xsg 102 all

         MAPPINGS FOR XSG 102
        --------------------
  No Physical Channels mapped.
ECHO DATA: LTID: PKT 601 DN: 6135557706
     No active call(s) on this LTID.
ECHO DATA: LTID: PKT 201 DN: 6135557702
     No active call(s) on this LTID.
ECHO DATA: LTID: PKT 301 DN: 6135557703
     No active call(s) on this LTID.
ECHO DATA: LTID: PKT 401 DN: 6135557704
```

PHRRCI-MOVE

Use the PHRRCI-MOVE command at the CI level to move the LTID from one XSG to another XSG.

MAP display of response to the PHRRCI-MOVE command

```
> MOVE PKT 999 TO XSG 103 FORCE
Force releasing this LTID will drop any calls in progress
Do you wish to continue with the move?
Please confirm ("YES", "Y", "NO", or "N"):
>Y
Request Queues at position 1
Processing Started on Request 1
INFO - Current LTMAP entry has been removed (PKT 999)
INFO - New LTMAP entry for ES has ben successfully created
RESULT - LTID (PKT 999) successfully moved from XSG 100 to XSG 103
Done.
>
```

POST (d option)

Use the POST command with the -d option to post an echo station DN at the line test position (LTP) level. This command puts the echo station DN in the control position for maintenance purposes.

If the technician uses the POST command (d option) to post the echo station DN, the XSG number displays instead of the LEN number. If an echo station is not mapped to an XSG, no XLIU information displays at the MAP level display.

Echo Station X.25 Loopback Testing (continued)

Translations table o w

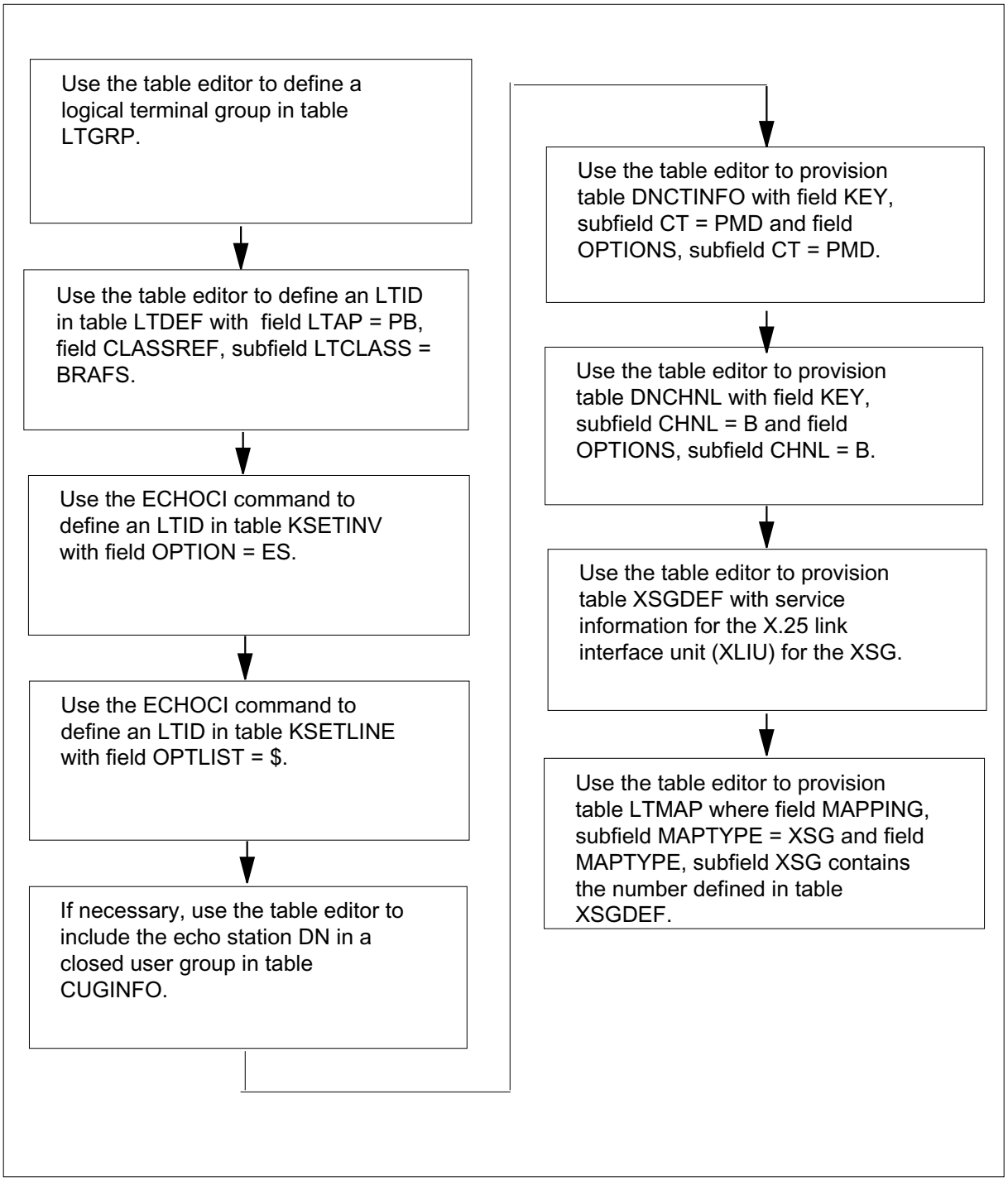
The list that follows includes the Echo Station X.25 Loopback Testing translations tables:

- Table LTGRP (Logical Terminal Group) contains a list of logical terminal groups for the exchange termination. This table also defines what types of terminals are allowed in a group.
- Table LTDEF (Logical Terminal Definition) defines logical terminals and maps them to line equipment numbers (LEN) and terminal equipment interfaces (TEI).
- Table KSETINV (Business Set and Data Unit Inventory) contains inventory data for business sets and data units. An entry occurs for each card slot assigned to the business set or data unit through SERVORD. Field OPTION, subfield ES activates the User Loopback Testing feature. Subfields TIMEOUT and MINUTES indicate if a timeout exists for the echo station and, if so, the value of the timeout.
- Table KSETLINE (Business Set and Data Unit Line Assignment) contains the DN appearances for business sets and data units. One entry is required for each DN-related key on a business set and a data unit. Datafill table KSETLINE through CI commands under CI directory ECHOCI because table KSETLINE is blocked for SERVORD for echo station LTIDs.
- Table CUGINFO (Closed User Group Information) contains a list of all the closed user groups (CUG) of which the DN or X.75 trunk is a member. This table also describes the services of each CUG.
- Table DNCTINFO (DN Call Type Information) stores the ISDN voice and data parameters on a DN and call type basis. The X.25 basic and supplementary service parameters apply only to the packet mode data (PMD) call type.
- Table DNCHNL (DN Channel) contains packet service parameters associated with a D or B channel for each parameter. (These parameters cannot be changed without taking the associated logical terminal out of service.)
- Table XSGDEF (X.25/X.75 Services Group Definition Table) contains service information for all X.25/X.75 link interface units (XLIU).
- Table LTMAP (Logical Terminal Mapping) identifies the logical terminals and both the associated LEN and the associated TEI.

The flowchart that follows provides the Echo Station X.25 Loopback Testing translations process.

Echo Station X.25 Loopback Testing (continued)

Table o w for Echo Station X.25 Loopback Testing



Echo Station X.25 Loopback Testing (continued)

The table that follows lists the datafill content used in the flowchart.

Data ll e xample for Echo Station X.25 Loopback Testing

Datafill table	Example data
LTGRP	PKT 2 (SAPI16) $
LTDEF	PKT 200 PB BRAFS $
KSETINV	PKT 200 ISDNKSET 2 ES Y 25 $
KSETLINE	PKT 51 DN N 5551105 LONS634 0 0 613 $ BRI PMD N $
CUGINFO	X25 6135551005 0 2543 0 x25 N Y
DNCTINFO	6135551105 PMD PMD (NUI N) (FSA N) (RCA N) (ICS N) (CUGS N) (TCN N) (FCPN N) (OCB N) (ICB N) (LCP N) $
DNCHNL	6135551108 B B (LLFSQ MOD8) (LLWS 2) (T1 12) (T2 1) (T3 2) (N2 12) (LCA (SLCN 1) (NPVC 0) (NOWI 12) (NNRC 20) (NOWO 0)$) (PLSQ MOD8) (NDWS Y 44) (NDPS Y 64 64) (DTCA Y 9600 9600) $
XSGDEF	8 MS 21 0 1 30 Y
LTMAP	PKT 100 XSG 100 $

Limitations and restrictions

The limitations and restrictions that follow apply to Echo Station X.25 Loopback Testing:

- An echo station is internal to the DMS switch.
- An echo station DN can attend a maximum of 16 calls at the same time.
- The only form of closed user group (CUG) supported is the ordinary closed user group (OCUG).
- An echo station DN can be shared with a BRI voice call type.
- No permanent virtual circuit (PVC) is allowed for an echo station DN.
- An echo station DN supports only the basic functionality to loop back the packets sent to it.
- The user cannot provision echo station with SERVORD.
- An echo station DN cannot be part of a hunt group.
- The user can provision a maximum of 5 echo stations per XLIU.

- The echo station DN must be a primary DN.
- This feature does not support the change operation on an echo station logical terminal ID (LTID) in table LTMAP.

Interactions

Echo Station X.25 Loopback Testing does not interact with other functionalities.

Activation and deactivation by the user

Echo Station X.25 Loopback Testing does not require activation or deactivation by the user.

Billing

The value of parameter ECHO_STAT_BILL_PARM determines whether Echo Station X.25 Loopback Testing generates billing records or changes. See “Office parameters used by Echo Station X.25 Loopback Testing" for information on how this feature affects billing.

Station Message Detail Recording

Echo Station X.25 Loopback Testing does not require Station Message Detail Recording.

Of ce parameter s used by Echo Station X.25 Loopback Testing

The table that follows lists the office parameter used by Echo Station X.25 Loopback Testing. For additional information about office parameters, refer to the *Office Parameters Reference Manual.*

Of ce parameter s used by Echo Station X.25 Loopback Testing

Table name	Parameter name	Explanation and action
ISDNVAR	ECHO_STAT_BILL_ PARM	This parameter determines whether the ISDN subsystem bills for the echo station call. The value for this parameter is ON or OFF. The default value of OFF means the system does not bill for calls to the echo station DN. The system does not generate the AMAB 120 record for echo station calls. If this parameter is ON, then the system generates the AMAB 120 billing records for all calls to the echo station.

Echo Station X.25 Loopback Testing (continued)

Data II sequence

The table that follows lists the tables that require datafill to put Echo Station X.25 Loopback Testing into operation. You must enter data into the tables in this order.

Data II requirements f or Echo Station X.25 Loopback Testing (Sheet 1 of 2)

Table	Purpose of table
LTGRP	Logical Terminal Group. This table contains a list of logical terminal groups for the exchange termination. This table lists the logical terminal groups that have been defined for the exchange termination. This table also indicates the types of terminals allowed in the group.
LTDEF	Logical Terminal Definition. This table identifies the logical terminals and maps them to LENs and TEIs. The logical terminal tables consist of tables LTCALLS, LTDATA, LTDEF, LTGRP, and LTMAP. The ISDN subsystem downloads data from these tables to NI-2 terminals during ISDN Parameter Downloading.
KSETINV(Note)	Business Set and Data Unit Inventory. This table contains inventory data for business sets and data units. An entry occurs for each card slot assigned to the business set or data unit.
KSETLINE(Note)	Business Set and Data Unit Line Assignment. This table lists each call appearance on the LTID and specifies DN parameters, such as customer group and ring, for the call appearance.
CUGINFO	Closed User Group Information. This table contains a list of all the CUGs of which the DN or X.75 trunk is a member. This table also describes the services provided by the CUG.
DNCTINFO	Directory Number Call Type Information. This table stores the ISDN voice and data parameters on a DN and call type basis. The X.25 basic and supplementary service parameters apply only to the packet mode data (PMD) call type.
DNCHNL	Directory Number Channel. This table stores the ISDN basic and supplementary service parameters for data on a DN and channel type basis. The X.25 basic and supplementary service parameters in this table are a refinement of the PMD call type in table DNCTINFO.
Note: This feature introduces a new command interface directory, ECHOCI, at the MAP CI level. The ECHOCI level automatically datafills this table. Therefore no datafill procedure is provided. Refer to section “ECHOCI" for an example of using the ECHOCI interface.	

Data ll requirements f or Echo Station X.25 Loopback Testing (Sheet 2 of 2)

Table	Purpose of table
XSGDEF	X.25/X.75 Services Group Definition. This table contains service information for all X.25/X.75 link interface units (XLIU). Each X.25/X.75 services group (XSG) is assigned to a unique XLIU at its datafill time.
LTMAP	Logical Terminal Mapping. This table maps the logical terminals to a LEN and to the terminal equipment interface (TEI), depending on the logical terminal access privilege (LTAP).
Note: This feature introduces a new command interface directory, ECHOCI, at the MAP CI level. The ECHOCI level automatically datafills this table. Therefore no datafill procedure is provided. Refer to section “ECHOCI" for an example of using the ECHOCI interface.	

Data ll related to Ec ho Station X.25 Loopback Testing for table LTGRP

The table that follows provides the datafill related to Echo Station X.25 Loopback Testing for table LTGRP. This table includes only those fields that apply directly to Echo Station X.25 Loopback Testing.

Data ll related to tab le LTGRP

Field	Subfield	Entry	Explanation and action
GROUP		Alphanumeric (vector of up to 8 characters)	Logical terminal group name. Enter the name of the group of logical terminals.
GROUPNO		0 to 31	Logical terminal group number. Enter the group number associated with the group name. Non-SAPI groups can be assigned any value from 0 to 31, but SAPI groups must be assigned a value between 0 and 15. Default group ISDN automatically receives a group number of 0.
OPTIONS		SAPI16	Logical terminal options. Enter the type of terminals allowed in a group. The only opton currently allowed is SAPI16. If SAPI16 is specified, both packet and circuit switching terminals can be datafilled for the group. If SAPI16 is not specified, no packet switching terminals can be datafilled for the group. The default group ISDN is specified as SAPI16.

Data ll e xample for table LTGRP

The figure that follows shows sample datafill for table LTGRP.

Echo Station X.25 Loopback Testing (continued)

MAP example for table LTGRP

```
GROUP GROUPNO OPTIONS
-------------------------------------------------------
PKT   2   (SAPI16) $
```

Data ll related to Echo Station X.25 Loopback Testing for table LTDEF

The table that follows provides the datafill related to Echo Station X.25 Loopback Testing for table LTDEF. This table includes only those fields that apply directly to Echo Station X.25 Loopback Testing.

Data ll related to tab le LTDEF

Field	Subfield	Entry	Explanation and action
LTKEY		see subfields	Logical terminal key. This field consists of subfields LTGRP and LTNUM.
	LTGRP	alphanumeric (up to 8 characters)	Logical terminal group. Enter the name of a group of logical terminals. Valid group names are in field GROUP of table LTGRP.
	LTNUM	1 to 1022	Logical terminal number. Enter a number to identify the logical terminal within the group.
LTAP		PB	Logical terminal access privilege. Enter PB for provisioned B-channel packet switching.
CLASSREF		see subfield	Class reference. This field consists of subfield LTCLASS.
	LTCLASS	BRAFS	Logical terminal class. Enter BRAFS for basic rate access (BRA) functional sets.

Data ll e xample for table LTDEF

The figure that follows shows sample datafill for table LTDEF.

MAP example for table LTDEF

```
LTKEY LTAP CLASSREF
-------------------------------------------------------
PKT 200 PB  BRAFS $
```

Data ll related to Ec ho Station X.25 Loopback Testing for table KSETINV

The table that follows provides error messages related to Echo Station X.25 Loopback Testing for table KSETINV. No datafill is provided because the MAP CI level ECHOCI provisions this table automatically.

Error messages for table KSETINV

The error messages that follow apply to table KSETINV.

Error messages for table KSETINV (Sheet 1 of 2)

Error message	Explanation and action
PB IS THE ONLY VALID ACCESS PRIVILEGE FOR AN ECHO STATION LTID	The access privilege for the echo station LTID is incorrect. Make sure that field LTAP in table LTDEF is set to PB for B-channel packet switching.
FOR AN ECHO STATION LTID, LTCLASS SHOULD BE BRAFS	The logical terminal class is incorrect in table LTDEF. For an echo station LTID, field CLASSREF, subfield LTCLASS must contain BRAFS (basic rate access).
ES OPTION IS ALLOWED ONLY WITH ISDNKSET	The keyset type for the echo station LTID is incorrect in table KSETINV. Field SETDATA, subfield KSET must contain ISDNKSET.
ECHO STATION LTID CAN HAVE ONLY ES OPTION	Field SETDATA, subfield OPTIONS contains options other than option ES. Other options are incompatible with the echo station option.

Echo Station X.25 Loopback Testing (continued)

Error messages for table KSETINV (Sheet 2 of 2)

Error message	Explanation and action
CAN NOT CHANGE ECHO STATION LTID TO NON ECHO STATION LTID OR VICE VERSA	The user tried to change the ES option for the echo station or tried to add an ES option to a non-echo station LTID.
LTID IS NOT DATAFILLED IN TABLE LTDEF	The LTID specified in field LEN, subfield LTID was not defined in field LTKEY, subfield LTNUM, of table LTDEF.

Data ll related to Ec ho Station X.25 Loopback Testing for table KSETLINE

The table that follows provides error messages related to Echo Station X.25 Loopback Testing for table KSETLINE. No datafill is provided because the MAP CI level ECHOCI provisions this table automatically.

Data ll e xample for table KSETLINE

The figure that follows shows sample datafill for table KSETLINE.

MAP example for table KSETLINE

```
KSETKEY   FORMAT   DNRESULT      KSFMTID  KSFMTARE
-------------------------------------------------------
PKT 51    DN N 5551105 LONS634 0 0 613 $ BRI  PMD N $
```

Error messages for table KSETLINE

The error messages that follow apply to table KSETLINE.

Error messages for table KSETLINE

Error message	Explanation and action
SECONDARY DN CAN NOT BE PROVISIONED TO AN ECHO STATION LTID	The user tried to assign a secondary DN to the echo station LTID. Assign a primary DN to the echo station LTID.
NO OPTIONS ARE ALLOWED TO BE PROVISIONED TO AN ECHO STATION LTID	The user tried to add options at the OPTLIST prompt. The echo station (ES) option is incompatible with other options.

Data ll related to Ec ho Station X.25 Loopback Testing for table CUGINFO

The table that follows provides the datafill related to Echo Station X.25 Loopback Testing for table CUGINFO. This table includes only those fields that apply directly to Echo Station X.25 Loopback Testing.

Data ll related to tab le CUGINFO

Field	Subfield	Entry	Explanation and action
CUGKEY		see subfields	CUGINFO key. This field consists of subfield ENDTYPE.
	ENDTYPE	X25	Endpoint type. Enter the network layer protocol for the CUG network endpoint interface.
	DN	numeric (up to 18 digits)	Directory number. Enter the DN datafilled in table KSETLINE for the CUG data terminal equipment (DTE).
	CUGIDX	0	CUG index number. The echo station DN is supported only for the outgoing closed user group (OCUG) type. For this type of CUG access, the CUG index must be 0.
DNIC		0000 to 9999	Data network identification code. Enter the data network identification code assigned to the CUG.
ITLK		0 to 65535	Interlock code. Enter the data network interlock code assigned to the CUG.
CUGACC		see subfield	CUG access. This field consists of the subfield ACCESS.
	ACCESS	X25	Access type. Enter the type of interface on which the CUG access is defined, and datafill subfields CUGIAB and CUGOAB.
	CUGIAB	N	CUG incoming access barred. Enter N (no); incoming calls cannot be barred for an echo station DN.
	CUGOAB	Y	CUG outgoing access barred. Enter Y (yes); outgoing calls must be barred for an echo station DN.

Data ll e xample for table CUGINFO

The figure that follows shows sample datafill for table CUGINFO.

Echo Station X.25 Loopback Testing (continued)

MAP example for table CUGINFO

```
                KEY DNIC   ITLK    CUGACC

-------------------------------------------------------
X25  6135551005 0    1234  2543     X25 N Y
```

Error messages for table CUGINFO

The error messages that follow apply to table CUGINFO.

Error messages for table CUGINFO

Error message	Explanation and action
ECHO STATION DN SUPPORTS ONLY FOR OCUG CUG ACCESS. FOR OCUG CUG ACCESS CUG INDEX VALUE CAN BE ONLY ZERO.	This message appears when the echo station DN user assigns a CUG index (subfield CUGIDX) value other than 0.
INCOMING CALLS CAN NOT BE BARRED FOR ECHO STATION DN.	This message appears when the echo station DN user datafills subfield CUGIAB (CUG incoming access barring facility) with Y.
OUTGOING CALLS SHOULD ALWAYS BE BARRED FOR AN ECHO STATION DN.	This message appears when the echo station DN user datafills subfield CUGOAB (CUG outgoing access barring facility) with N.

Data ll related to Ec ho Station X.25 Loopback Testing for table DNCTINFO

The table that follows provides the datafill related to Echo Station X.25 Loopback Testing for table DNCTINFO. This table includes only those fields that apply directly to Echo Station X.25 Loopback Testing.

Data ll related to tab le DNCTINFO (Sheet 1 of 3)

Field	Subfield	Entry	Explanation and action
KEY		see subfields	Key. This key field is made up of subfields DIGKEY and CT.
	DIGKEY	vector of up to 18 digits	Digilator key. This field is the first part of the key to this table. Enter the DN.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCTINFO (Sheet 2 of 3)

Field	Subfield	Entry	Explanation and action
	CT	PMD	Call type. This field is the second part of the key to this table. For packet-mode data, enter PMD.
OPTIONS		see subfield	Options. This field contains subfield CT.
	CT	PMD, CMD, or VI	Call type options. Enter a call type. For PMD, datafill subfield PMD_OPTION.
	PMD_OPTION	CUGS, FCPN, FSA, RCA, TCN	Packet-mode options. Enter up to 11 packet mode options. Datafill subfield SUBSCRIBED for each option. CUGS (closed user group subscription) enables the DTE to be a part of one or more user groups. Datafill subfield CUGFSEL or PRFCUG. FCPN (flow control parameter negotiation allowed) allows the calling user, called user, and network to engage in a negotiation. They negotiate the flow control parameters for each direction of communication on a virtual call. FSA (fast select acceptance) allows the called party to receive incoming fast select calls. RCA (reverse charging acceptance) allows the called party to accept call charges. TCN (throughput class negotiation allowed) allows the calling user, called user, and network to engage in a negotiation of the throughput class.
	CUGFSEL	OCUG	Closed user group subscription. If the entry in subfield PMD_OPTION is CUGS, datafill this subfield. This field indicates the restrictions applied to the CUGs to which this DN/CT belongs. The echo station DN is supported only for the outgoing closed user group (OCUG) type.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCTINFO (Sheet 3 of 3)

Field	Subfield	Entry	Explanation and action
	PRFCUG	Y or N	Preferential closed user group. If the entry in subfield PMD_OPTION is CUGS, datafill this subfield. This field indicates if the subscriber selected a distinct CUG for calls requested without indicating a CUG. Enter Y or N.
	SUBSCRIBED	Y or N	Subscribed. Enter Y (yes) to subscribe to the option. The default for PMD is N (no).

Data ll e xample for table DNCTINFO

The figure that follows shows sample datafill for table DNCTINFO.

MAP example for table DNCTINFO

```
          KEY
                                OPTIONS
-------------------------------------------------------------
    6135551105 PMD
PMD (NUI N) (FSA N) (RCA N) (ICS N) (CUGS N) (TCN N)
(FCPN N) (OCB N) (ICB N) (LCP N) $
```

Error messages for table DNCTINFO

The error messages that follow apply to table DNCTINFO.

Error messages for table DNCTINFO (Sheet 1 of 2)

Error message	Explanation and action
ECHO STATION DOES NOT SUPPORT NUI	The user tried to subscribe to the NUI option for the echo station DN.
ECHO STATION DOES NOT SUPPORT ICS	The user tried to subscribe to the ICS option for the echo station DN.
Note: Table SVCDATA defines the default service profile (X.25 parameters and facilities) for packet DN. If the user provisions subfield PMD_OPTION with no entries, then the system gets default values for this subfield from table SVCDATA. However, the echo station DN does not support many of the X.25 facilities defined as options in table DNCTINFO. The system overrides any default values in table SVCDATA for options that echo station DN does not support.	

Error messages for table DNCTINFO (Sheet 2 of 2)

Error message	Explanation and action
ECHO STATION DOES NOT SUPPORT CUGOAIA	The user tried to subscribe to the CUGOAIA option for the echo station DN.
ECHO STATION DOES NOT SUPPORT CUGOA	The user tried to subscribe to the CUGOA option for the echo station DN.
ECHO STATION DOES NOT SUPPORT CUGIA	The user tried to subscribe to the CUGIA option for the echo station DN.
ECHO STATION DOES NOT SUPPORT OCB	The user tried to subscribe to the OCB option for the echo station DN.
ECHO STATION DOES NOT SUPPORT ICB	The user tried to subscribe to the ICB option for the echo station DN.
ECHO STATION DOES NOT SUPPORT RPOAB	The user tried to subscribe to the RPOAB option for the echo station DN.
ECHO STATION DOES NOT SUPPORT LCP	The user tried to subscribe to the LCP option for the echo station DN.
WARNING: ECHO STATION DOES NOT SUPPORT NUI, ICS, OCB, ICB, LCP, RPOAB.	The user added the echo station DN without any options in subfield PMD_OPTION. (See note.)
Note: Table SVCDATA defines the default service profile (X.25 parameters and facilities) for packet DN. If the user provisions subfield PMD_OPTION with no entries, then the system gets default values for this subfield from table SVCDATA. However, the echo station DN does not support many of the X.25 facilities defined as options in table DNCTINFO. The system overrides any default values in table SVCDATA for options that echo station DN does not support.	

Data ll related to Ec ho Station X.25 Loopback Testing for table DNCHNL

The table that follows provides the datafill related to Echo Station X.25 Loopback Testing for table DNCHNL. This table includes only those fields that apply directly to Echo Station X.25 Loopback Testing.

Data ll related to tab le DNCHNL (Sheet 1 of 8)

Field	Subfield	Entry	Explanation and action
KEY		see subfields	Key. This is the first and key field of the table. It consists of subfields DIGKEY and CHNL.
	DIGKEY	vector of up to 18 digits	Digilator key. Enter the directory number (DN).

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCHNL (Sheet 2 of 8)

Field	Subfield	Entry	Explanation and action
	CHNL	B	Channel. Enter the channel type. The echo station DN supports only channel type B.
OPTIONS		see subfields	Channel type options. This field consists of subfield CHNL.
	CHNL	B	Channel. Enter the channel type. Enter B for channel type B and datafill BOPTIONS as explained.
	BOPTIONS	DTCA, LCA, N2, NDPS, NDWS, PLSQ, T1, T2, or T3	B-channel type options. Enter up to 11 of the following B channel type options: DTCA (default throughput class assignment). Datafill refinement DTCA. LCA (logical channel assignment). Datafill refinement LCA. N2 (maximum retransmissions). Datafill refinement N2. NDPS (non-standard default packet size). Datafill refinement NDPS. NDWS (non-standard default window size). Datafill refinement NDWS. PLSQ (packet level sequencing). Datafill refinement PLSQ. T1 (acknowledgment timer). Datafill subfield T1. T2 (response timer). Datafill subfield T2. T3 (idle channel timer). Datafill subfield T3. Each option must be separated from the next by a blank space.
	DTCA	see subfield	Default throughput class assignment. If the entry in field BOPTIONS is DTCA, datafill this field. This field consists of subfield SUBSCRIBED.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCHNL (Sheet 3 of 8)

Field	Subfield	Entry	Explanation and action
	SUBSCRIBED	Y or N	Subscribed. Enter Y (yes) to subscribe to a default throughput class, that is, a user default throughput class different from the value provided by the network for each direction of communication. Datafill refinements IDTCA and ODTCA. Otherwise, enter N (no). The default value for this field is N.
	IDTCA	75, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 48000, 56000, 64000	Incoming default throughput class assignment. Enter the non-standard default throughput class for incoming calls. There is no default value for this field.
	ODTCA	75, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 48000, 56000, 64000	Outgoing default throughput class assignment. Enter the non-standard default throughput class for outgoing calls. There is no default value for this field.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCHNL (Sheet 4 of 8)

Field	Subfield	Entry	Explanation and action
	LCA	SLCNNPVCN OWINNRCN OWO	Logical channel assignment. If the entry in refinement BOPTIONS is LCA, datafill this refinement. Enter one of the following assigned logical channels for each type of service at the time of subscription: • SLCN (start logical channel number). Datafill refinement SLCN. • NPVC (number of permanent virtual circuit) • NOWI (number of one way incoming logical channel) • NNRC (number of non-restricted channel) • NOWO (number of one way outgoing logical channel) ***Note:*** The parameters SLCN, NPVC, NOWI, NNRC, and NOWO must satisfy the following: NPVC + NOWI + NNRC + NOWO <= 512, and SLCN + NPVC + NOWI + NNRC + NOWO <= 4096
	SLCN	1 to 4095	Start logical channel number. If the entry in refinement LCA is SLCN, datafill this refinement. Enter the starting channel for the logical channel assignment. The default value for this field is 1.
	NOWO	0	Number of one-way outgoing logical channel. Enter the subscribed number of the one-way outgoing logical channel. For an echo station DN the value of this field must be 0 (zero).

Echo Station X.25 Loopback Testing (continued)

Data Il related to tab le DNCHNL (Sheet 5 of 8)

Field	Subfield	Entry	Explanation and action
	NNRC	1 to 16	Number of non-restricted channels. Enter the subscribed number of non-restricted logical channels. A minimum of one channel must be subscribed to. The default value for this field is 1. The value of this field cannot exceed 16 for an echo station DN. The combined value of this field and subfield NOWI cannot exceed 16 for an echo station DN.
	NOWI	0 to 15	Number of one-way incoming logical channels. Enter the subscribed number of one-way incoming logical channels. The default value for this field is 0 (zero). The combined value of this field and subfield NNRC cannot exceed 16 for an echo station DN.
	NPVC	0	Number of permanent virtural circuits. Enter the subscribed number of permanent virtual circuits. For an echo station DN the value of this field must be 0 (zero).
	T1	10 to 200	Acknowledgment timer. If the entry in refinement BOPTIONS is T1, datafill this refinement. Enter the time period between the transmission of consecutive frames. Enter a value between 10 to 200 (with an increment of 1 in units of 100 ms). The default value for this field is 20 of 100 ms.
	T2	0 to 4	Response timer. If the entry in refinement BOPTIONS is T2, datafill this refinement. Enter the response time between reception of the last bit of frame and sending corresponding acknowledgement. Enter a value between 0 (zero) and 4 (with an increment of 1 in units of 100 ms). The default value for this field is 2 of 100 ms.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCHNL (Sheet 6 of 8)

Field	Subfield	Entry	Explanation and action
	T3	1 to 30	Idle channel timer. If the entry in refinement BOPTIONS is T3, datafill this refinement. Enter the time LAPB can stay idle before layer 3 applies failure procedures. Enter a value between 1 and 30 s in 1-s increments. The default value for this field is 5 s.
	N2	2 to 15	Maximum retransmissions. If the entry in refinement BOPTIONS is N2, datafill this refinement. Enter the maximum number of attempts to compile a successful transmission. Enter a value between 2 and 15. The default value for this field is 3.
	PLSQ	MOD8	Packet level sequencing. If the entry in refinement BOPTIONS is PLSQ, datafill this refinement. Enter the sequential numbering of packets for each direction of transmission. The value of this field must be MOD8 for an echo station DN.
	NDWS	see subfield	Non-standard default window size. If the entry in refinement BOPTIONS is NDWS, datafill this refinement. This field allows the user to subscribe to a packet layer window size for each direction of communication. This field consists of subfield SUBSCRIBED.
	SUBSCRIBED	Y or N	Subscribed. If the entry in refinement BOPTIONS is NDSW, datafill this subfield. Enter Y to subscribe to a packet layer window size for each direction of communication. Datafill refinements IPLWS and OPLWS as explained below. Otherwise, enter N. The default value for this field is N.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCHNL (Sheet 7 of 8)

Field	Subfield	Entry	Explanation and action
	IPLWS	1 to 127	Incoming packet layer window size. If the entry in subfield SUBSCRIBED is Y, datafill this refinement. Enter the non-standard window size for incoming calls. Enter a value between 1 and 7 for MOD8. Enter a value between 1 and 127 for MOD128. The default value for this field is 2.
	OPLWS	1 to 127	Outgoing packet layer window size. If the entry in subfield SUBSCRIBED is Y, datafill this refinement. Enter the non-standard window size for outgoing calls. Enter a value between 1 and 7 for MOD8. Enter a value between 1 and 127 for MOD128. The default value for this field is 2.
	NDPS	see subfield	Non-standard default packet size. If the entry in refinement BOPTIONS is NDPS, datafill this refinement. This field consists of subfield SUBSCRIBED.
	SUBSCRIBED	Y or N	Subscribed. If the entry in refinement BOPTIONS is NDPS, datafill this subfield. Enter Y to subscribe to a maximum packet size for each direction of communication. Datafill refinements IMPS and OMPS as explained below. Otherwise, enter N. The default value for this field is N.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le DNCHNL (Sheet 8 of 8)

Field	Subfield	Entry	Explanation and action
	IMPS	16, 32, 64, 128, 256	Incoming maximum packet size. If the entry in subfield SUBSCRIBED is Y, datafill this refinement. Enter the maximum allowable packet size for an incoming call. The default value for this field is 128. The value of this field must equal the value for subfield OMPS for an echo station DN.
	OMPS	16, 32, 64, 128, 256	Outgoing maximum packet size. If the entry in subfield SUBSCRIBED is Y, datafill this refinement. Enter the maximum allowable packet size for outgoing calls. The default value for this field is 128. The value of this field must equal the value for subfield IMPS for an echo station DN.

Data ll e xample for table DNCHNL

The figure that follows shows sample datafill for table DNCHNL.

MAP example for table DNCHNL

```
         KEY
                                    OPTIONS

------------------------------------------------------------
        6135551108 B
B (LLFSQ MOD8) (LLWS 2) (T1 12) (T2 1) (T3 2) (N2 12)
(LCA (SLCN 1) (NPVC 0) (NOWI 12) (NNRC 20) (NOWO 0)
(PLSQ MOD8) (NDWS Y 44) (NDPS Y 64 64) (DTCA Y 9600 9600)
$
```

Echo Station X.25 Loopback Testing (continued)

Warning messages for table DNCHNL

The warning messages that follow apply to table DNCHNL.

Warning messages for table DNCHNL

Warning message	Explanation and action
WARNING: ECHO STATION DOES NOT SUPPORT L2 PARAMETER.	When the user configures layer 2 (L2) parameters for the echo station DN, this message occurs. ***Note:*** The system allows the user to datafill layer 2 parameters, such as link level frame sequencing (LLFSQ) and link level window size (LLWS). These parameters, however, have no effect on the echo station DN. This feature introduces parameters in table KSETINV that determine the timeout value and other layer 2 values for the echo station DN.
WARNING: NPVC FOR ECHO STATION CAN NOT BE GREATER THAN O.	The default for this subfield is 0. The user cannot modify this value for an echo station DN.
WARNING: NOWO FOR ECHO STATION CAN NOT BE GREATER THAN 0.	The default for this subfield is 0. The user cannot modify this value for an echo station DN.

Error messages for table DNCHNL

The error messages that follow apply to table DNCHNL.

Error messages for table DNCHNL (Sheet 1 of 2)

Error message	Explanation and action
ECHO STATION SUPPORTS ONLY B CHANNEL TYPE.	The user tried to provision a D channel for an echo station.
ERROR: ECHO STATION SUPPORTS ONLY PLSQ MOD8	The user tried to provision the PLSQ parameter with a value of MOD128.
ERROR: ECHO STATION CAN NOT HAVE NNRC > 16 PROVISIONED ON IT.	The user tried to provision the NNRC parameter with a value greater than 16.
ERROR: ECHO STATION CAN NOT HAVE NOWI+ NNRC > 16 PROVISIONED ON IT	The user tried to provision parameters NOWI and NNRC with a combined total value greater than 16.
ERROR: ECHO STATION SHOULD HAVE EQUAL IMPS AND OMPS	The user tried to provision parameters IMPS and OMPS with different values.

Echo Station X.25 Loopback Testing (continued)

Error messages for table DNCHNL (Sheet 2 of 2)

Error message	Explanation and action
`ERROR: NPVC FOR ECHO STATION CAN NOT BE GREATER THAN 0`	The user tried to provision the NPVC parameter with a value greater than 0.
`ERROR: NOWO FOR ECHO STATION CAN NOT BE GREATER THAN O`	The user tried to provision the NOWO parameter with a value greater than 0.

Data ll related to Ec ho Station X.25 Loopback Testing for table XSGDEF

The table that follows provides the datafill related to Echo Station X.25 Loopback Testing for table XSGDEF. This table includes only those fields that apply directly to Echo Station X.25 Loopback Testing.

Data ll related to tab le XSGDEF (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
XSGNO		see subfield	X.25/X.75 services group number. This field consists of subfield XSG_EXT_NO.
	XSG_EXT_NO	0 to 749	X.25/X.75 services group external number. Enter the X.25/X.75 services group (XSG) external index number.
HOST		see subfield	Host controller. This field consists of subfield CONTROL.
	CONTROL	LIM or MS	LIU host controller. Enter the host peripheral module (PM) of the XSG/XLIU. Enter LIM for link interface module and datafill refinement LIMNUM. Enter MS for the message switch and datafill refinements MSCARD and MSPORT.
	LIMNUM	0 to 16	Link interface module number. If the entry in subfield CONTROL is LIM, datafill this refinement. Enter the LIM number. Go to field SHELF.
	MSCARD	5 to 23	Message switch card. If the entry in subfield CONTROL is MS, datafill this refinement. Enter the MS card number.

Echo Station X.25 Loopback Testing (continued)

Data ll related to tab le XSGDEF (Sheet 2 of 2)

	MSPORT	0 to 3	Message switch port. If the entry in subfield CONTROL is MS, datafill this refinement. Enter the MS port number.
SHELF		0 to 3	Shelf. Enter the shelf of the XLIU that is associated with the XSG.
CHANNELS		1 to 31	Channels. Enter the number of channels to configure on the XSG. The recommended value is 20. This entry allows other channels to be assigned as required.
ARA		Y or N	Automatic Resource Assignments. Enter Y to allow use of ARA to assign new B-channel packet services automatically to XSG.

Data ll e xample for table XSGDEF

The figure that follows shows sample datafill for table XSGDEF.

MAP example for table XSGDEF

```
XSGNO   HOST       SHELF   CHANNELS   ARA

-------------------------------------------------------------
8       MS 21 0     1       30        Y
```

Echo Station X.25 Loopback Testing (continued)

Data ll related to Ec ho Station X.25 Loopback Testing for table LTMAP

The table that follows provides the datafill related to Echo Station X.25 Loopback Testing for table LTMAP. This table includes only those fields that apply directly to Echo Station X.25 Loopback Testing.

Data ll related to tab le LTMAP

Field	Subfield	Entry	Explanation and action
LTKEY		see subfields	Logical terminal key. This field consists of subfields LTGRP and LTNUM.
	LTGRP	alphanumeric (maximum 8 characters)	Logical terminal group. Enter the group of the logical terminal.
	LTNUM	1 to 1022	Logical terminal number. Enter the logical terminal number within the group.
MAPPING		see subfield	Logical terminal mapping. This field consists of subfield MAPTYPE.
	MAPTYPE	XSG	Logical terminal mapping type. Enter the type of mapping being used. Enter XSG and datafill subfield XSG.
	XSG	0 to 749	X.25 service group. The echo station LTID must be part of an XSG. Assign an XSG number for the echo station.

Data ll e xample for table LTMAP

The figure that follows shows sample datafill for table LTMAP.

MAP example for table LTMAP

```
LTKEY           MAPPING          OPTION

-------------------------------------------------------------
PKT 100         XSG 100          $
```

Echo Station X.25 Loopback Testing (continued)

Error messages for table LTMAP

The error messages that follow apply to table LTMAP.

Error messages for table LTMAP

Error message	Explanation and action
MAXIMUM 5 ECHO STATION LTID CAN BE ASSIGNED TO A XSG.	The user tried to assign more than five echo station LTIDS to one XSG.
ECHO STATION LTID CANNOT BE MAPPED TO A LEN.	The user tried to map an echo station LTID to a line equipment number (LEN).
NON ECHO STATION LTID CAN NOT BE MAPPED TO XSG	The user tried to map a non-echo station LTID to an XSG. Or the user tried to map an LTID that is provisioned only in table LTDEF to an XSG in table LTMAP.
ECHO STATION LTID CANNOT BE MAPPED TO A CLLI	The user tried to map an echo station LTID to a common language location identifier (CLLI) instead of an XSG.
NO OPTIONS ARE ALLOWED TO BE PROVISIONED TO AN ECHO STATION LTID.	The user tried to datafill options for an echo station LTID.
XSG IS NOT DEFINED IN TABLE XSGDEF	The user tried to map an XSG defined in table XSGDEF without an XLIU assignment to an echo station LTID.
NO XLIU IS ASSIGNED TO THE XSG DEFINED IN TABLE XSGDEF.	The user tried to change the XSG assigned to an echo station LTID to an XSG without an XLIU assignment in table XSGDEF.
CHANGE OPERATION IS NOT ALLOWED FOR ECHO STATION LTID. DELETE THE TUPLE AND ADD NEW TUPLE.	The user tried to use the table editor CHA command to change the XSG number assigned to an echo station LTID.
Table DNCTINFO in not datafilled for this LTID	The user tried to add an echo station LTID to table LTMAP when no corresponding DN tuple existed in table DNCTINFO.
Table DNCHNL is not datafilled for this LTID	The user tried to add an echo station LTID in table LTMAP when no corresponding DN tuple existed in table DNCHNL. Message occurs even if an entry exists in table DNCTINFO for the echo station DN.

Echo Station X.25 Loopback Testing (end)

Translation veri cation tools

Echo Station X.25 Loopback Testing does not use translation verification tools.

SERVORD

Echo Station X.25 Loopback Testing does not use the Service Order System (SERVORD). Use the table editor and ECHOCI MAP level commands to provision the echo station. The table that follows lists the SERVORD commands that do not support echo station LTIDs or DNs. This table lists the error messages that display if an end user tries to use these SERVORD commands with an echo station LTID or DN.

SERVORD commands with error messages

SERVORD command	Error message
SLT ATT	SLT command can not be used for Echo station LTID/DN.
SLT DET	SLT command can not be used for Echo station LTID/DN.
NEW	The NEW command can not be used for Echo station LTID/DN. Please use ECHOCI to modify Echo Station data.
OUT	The OUT command can not be used for Echo station LTID/DN. Please use ECHOCI to modify Echo Station data.
EST	EST command can not be used for an Echo Station LTID/DN.
ADD	ADD command can not be used for an Echo Station LTID/DN.
SETPH	SETPH command can not be used for an Echo Station LTID/DN.
ADDPH	ADDPH command can not be used for an Echo Station LTID/DN.
CHAPH	CHAPH command can not be used for an Echo Station LTID/DN.
DELPH	DELPH command can not be used for an Echo Station LTID/DN.
SUS	SUS command can not be used for an Echo Station LTID/DN.
RES	RES command can not be used for an Echo Station LTID/DN.
CHG	CHG command can not be used for an Echo Station LTID/DN.

Eight Logical Terminals on a BRI

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA009 and up

Eight Logical Terminals on a BRI was introduced in NA009.

Prerequisites

To operate, Eight Logical Terminals on a BRI has the following prerequisite: More than 2-BCH Terminals on a BRI-XPM, AF7249.

Description

Eight Logical Terminals on a BRI increases the number of NI-2 provisioned logical terminals that a Basic Rate Interface (BRI) can support from two to eight.

An NI-2 FIT is always associated with a single NI-2 logical terminal identifier (LTID), but up to eight NI-2 NITs can be associated with a single NI-2 default LTID. A BRI interface can support only one NI-2 default LTID. All terminals have access to both B-channels with a single terminal endpoint identifier (TEI).

Pre-NA009 functionality

In NA007, only one logical terminal was allowed on an interface. NA008 introduced NI-2 logical terminals that support parameter downloading and default logical terminals. Each NI-2 logical terminal supported one FIT, and the default logical terminal supported eight NITs. B-channel contention management, introduced in NA008, made possible the support of a FIT and multiple NITs (maximum of eight) on an interface. In NA008, interface configurations were limited to the following: two FITs, or one FIT and seven NITs, or eight NITs. Up to two logical terminals were allowed on an interface.

Operation

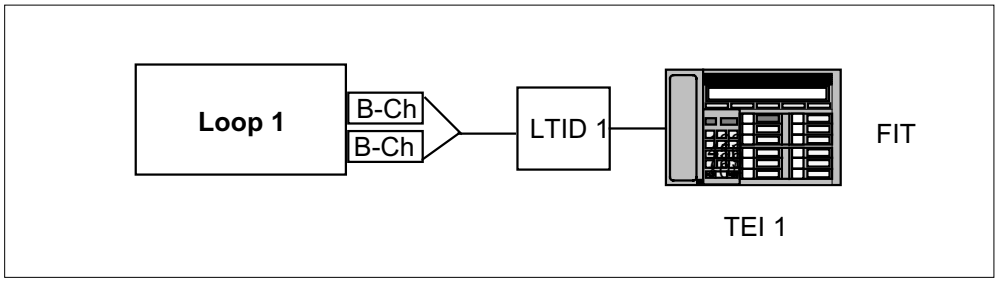
The following NI-2 interface configurations are supported in NA008 and up.

NA008 interface con gurations

The following example shows one 2 B-channel FIT on an interface.

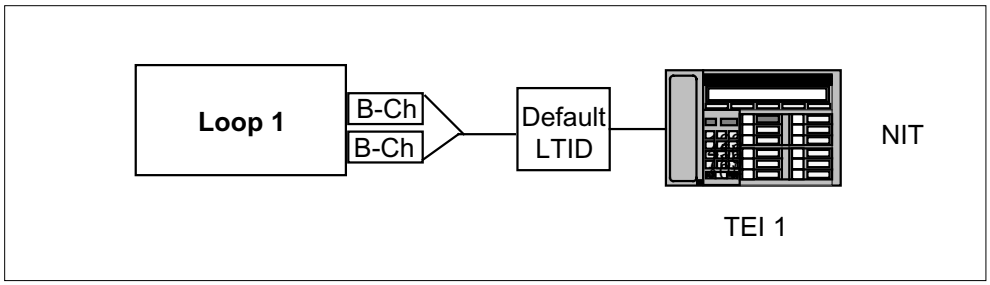
Eight Logical Terminals on a BRI (continued)

One 2 B-channel FIT



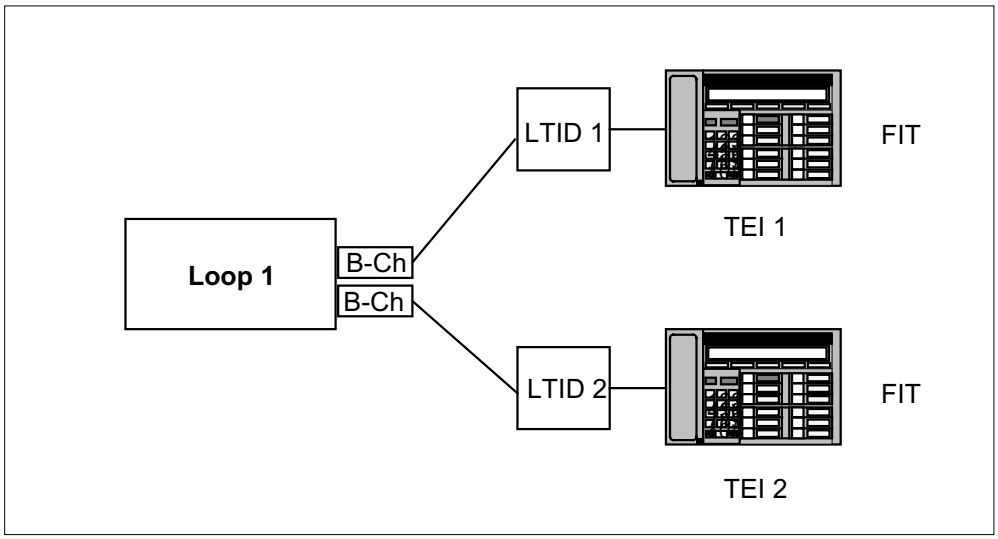
The following figure shows one 2 B-channel NIT on an interface.

One 2 B-channel NIT



The following figure shows two 1 B-channel FITs on an interface.

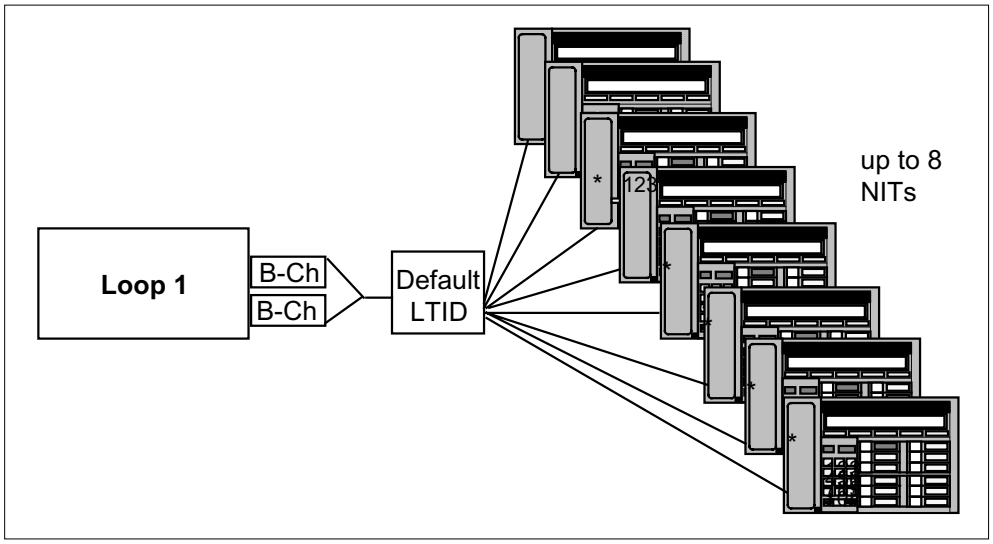
Two 1 B-channel FITs



The following figure shows eight NITs on an interface. All NITs use a single default LTID.

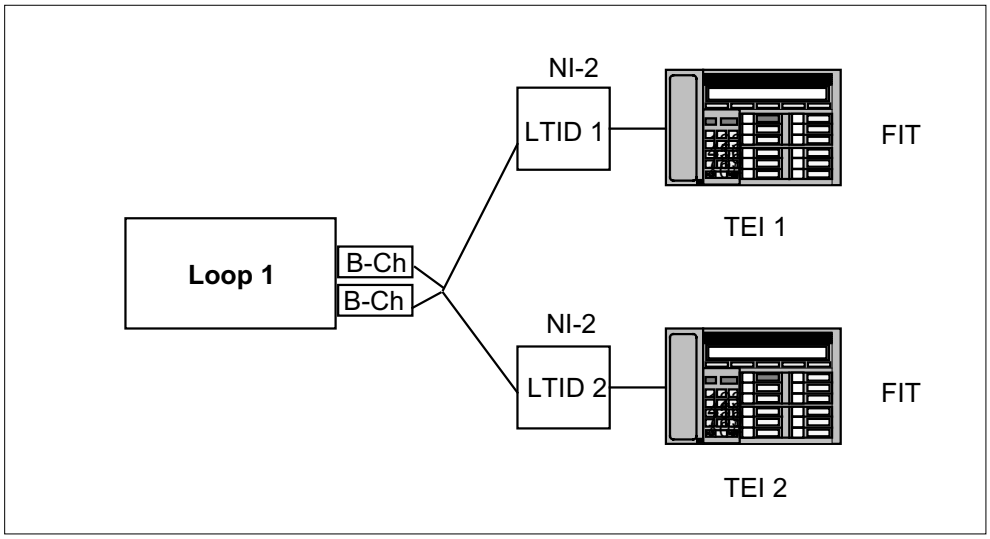
Eight Logical Terminals on a BRI (continued)

Up to eight NITs



The following figure shows two 2 B-channel FITs on an interface.

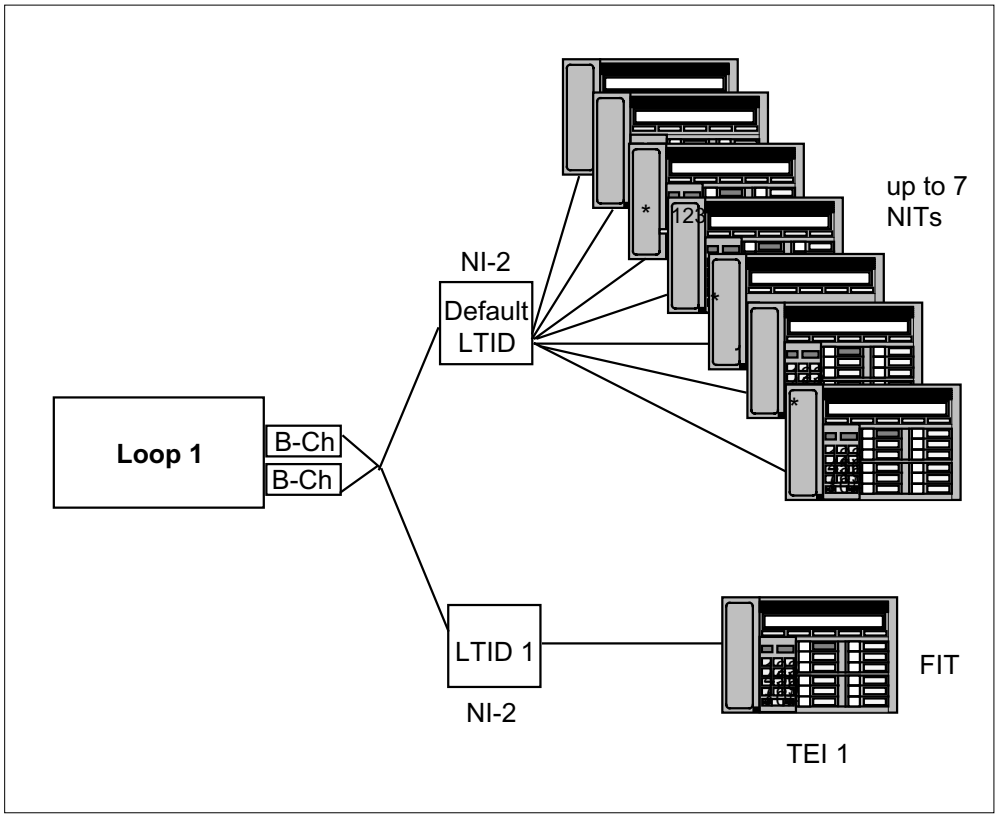
Two 2B NI-2 FITs with access to both B-channels



The following figure shows one 2 B-channel FIT and up to seven 2 B-channel NITs on the same interface.

Eight Logical Terminals on a BRI (continued)

One 2B NI-2 FIT and up to seven 2B NITs



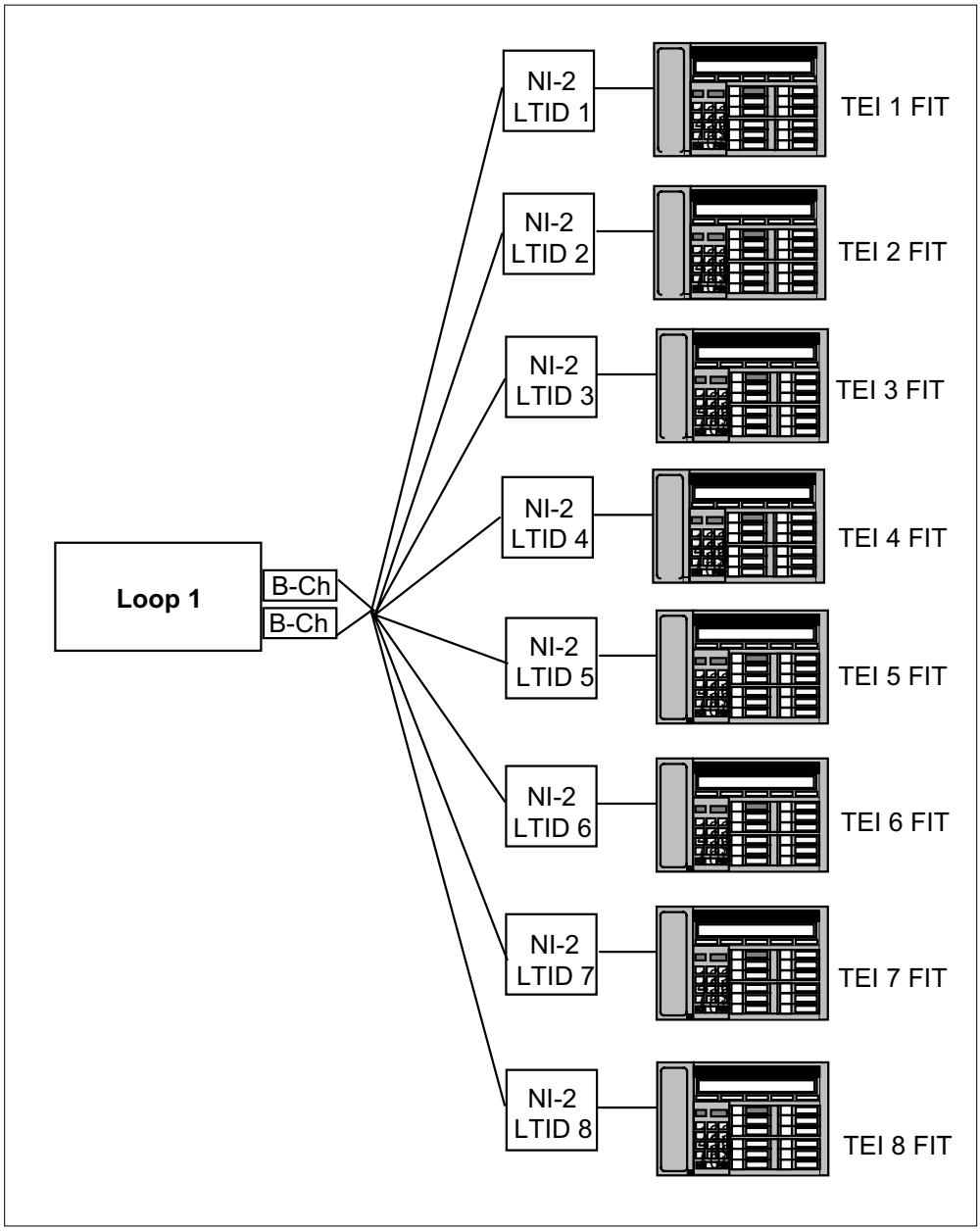
Additional NA009 interface con gurations

The following examples show the additional interface configurations possible in NA009 and up.

The following figure shows up to eight 2 B-channel FITs on an interface. Each FIT has its own logical terminal.

Eight Logical Terminals on a BRI (continued)

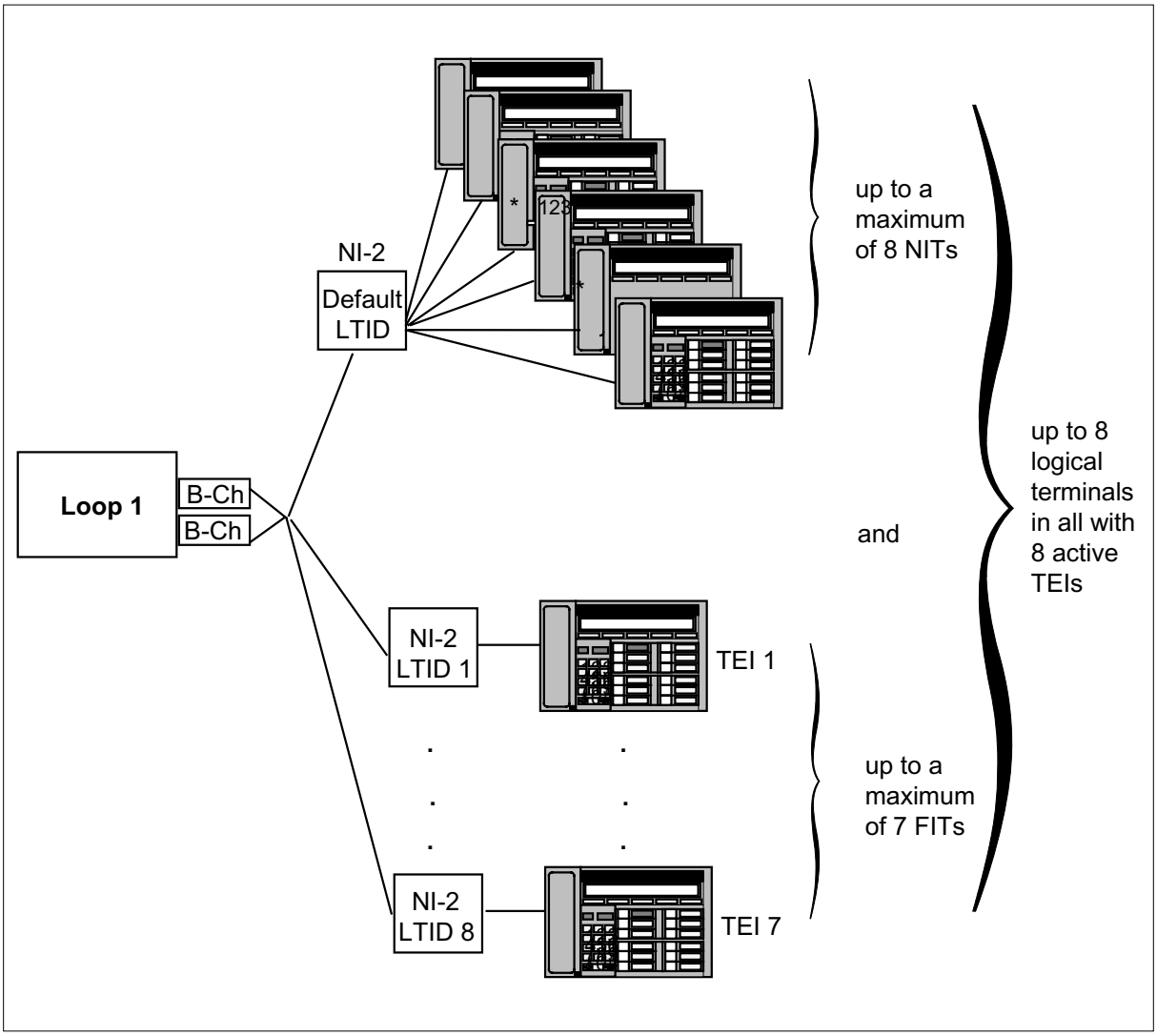
Up to eight 2B NI-2 FITs each with their own logical terminal



The following figure shows that any combination of 2 B-channel NITs and FITs, up to a maximum of eight, is allowed on an interface.

Eight Logical Terminals on a BRI (continued)

Any combination of 2B NI-2 FITs/NITs up to a maximum of eight LTIDs



Translations table o w

Eight Logical Terminals on a BRI does not affect translations table flow.

Limitations and restrictions

The following limitation and restriction applies to Eight Logical Terminals on a BRI:

- This feature applies to NI-2 interfaces only. FITs cannot share a logical terminal.
- A maximum of only one default logical terminal is allowed on a loop.

Eight Logical Terminals on a BRI (end)

Interactions

Eight Logical Terminals on a BRI has no functionality interactions.

Activation/deactivation by the end user

Eight Logical Terminals on a BRI requires no activation or deactivation by the end user.

Billing

Eight Logical Terminals on a BRI does not affect billing.

Station Message Detail Recording

Eight Logical Terminals on a BRI does not affect Station Message Detail Recording.

Data lling of ce parameter s

Eight Logical Terminals on a BRI does not affect office parameters.

Translation veri cation tools

Eight Logical Terminals on a BRI does not use translation verification tools.

SERVORD

This feature modifies the SLT ATT command to allow a maximum of eight LTIDs on a loop.

The following error message displays when you attach an LTID to a loop and you exceed the LTID engineering limit (LTID limit or both LTID and DN limits).

```
*** ERROR - Can not attach anymore LTID to the LEN***
Engineering limits for LTID were exceeded.
```

The following error message displays when you attach an LTID to a loop and you exceed the engineering limit but not the LTID limit.

```
*** ERROR - Can not attach the specified LTID to the LEN***
Engineering limit for DNs were exceeded.
```

The following error message displays when you add a new DN, ICM, or GIC key to a mapped LTID and you exceed the DN engineering limit.

```
*** ERROR - Can not add any DNs to the specified LTID***
Engineering limit for DNs were exceeded.
```

ISDN Packet NIT Support

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA009 and up

ISDN Packet NIT Support was introduced in NA009.

Prerequisites

To operate, ISDN Packet NIT Support has the following prerequisites:

- ISDN Packet Single DN, AF6782
- Non-Initializing Terminals, AF6461
- SERVORD for IVDT and NIT, AF6441
- Table Control for 2B FITs/NITs and 1B NITs, AF6439

Description

ISDN Packet NIT Support creates the following terminal configurations:

- one dynamic terminal endpoint identifier (TEI) packet-only non-initializing terminal (NIT) can access packet service
- one dynamic TEI integrated NIT can access packet service (up to eight dynamic TEI integrated NITs can access voice/circuit service, but only two can be active at a time)

Note 1: You can only provision one NIT on a loop at a time.

Note 2: The total number of terminals on a loop (fully initializing terminals [FIT], NITs, static TEI packet, and nailed-up B-channel packet) cannot exceed eight.

ISDN Packet NIT Support allows provisioning of dynamic TEIs for integrated and packet-only NITs. This feature allows packet NITs to coexist with FITs and static TEI packet terminals.

With this feature, operating company provisioning personnel can provision an integrated and a packet-only NIT with dynamic TEI (however, only one NIT can be logically attached to a LEN). Assignment of the dynamic TEI option to these NITs is automated unconditionally at provisioning time. This feature eliminates the need to manually coordinate TEI assignment with the terminal end user.

Dynamic and static TEI

Prior to this feature, packet-only terminals (access privilege of D) did not support *dynamic* TEI. They required *static* datafill of the TEI at provisioning. With this feature, assignment of the *dynamic* TEI option to integrated and packet NITs is provisioned automatically in SERVORD. Operating companies can still use *static* TEI packet-only terminals as well as 2BD integrated FITs to access packet service. All pre-NA009 terminal configurations are supported.

Dynamic TEI means that the TEI is assigned automatically to the terminal by network-assigned or user-assigned procedures (UNATEI). Static TEI means that the TEI is statically assigned at provisioning time; the value has to be manually coordinated between the terminal and the switch. The logical terminal owner datafills the TEI on the ISDN device, and switch personnel datafill the TEI at the switch. The TEI is a number assigned to the device.

Packet-only and integrated NITs

Packet-only NITs support the access privilege of D only, which means that low-speed packet data on the D-channel is the only information that can be sent and received on that terminal. NITs, as opposed to fully initializing terminals (FIT), use the default service profile assigned to the terminal (fixed feature keys with predefined values provisioned against the default terminal or dial access codes). NITs do not require service profile identification (SPID) initialization. FITs, by definition, use dynamic TEI and require SPIDs.

Only one packet NIT on a loop has access to packet service. Packet NITs can coexist with both NI-1 and NI-2 terminals.

Integrated NITs support the access privilege of 2BD, which means that both D-channel low-speed packet data and B-channel voice/circuit service is the only information that can be sent and received on the terminal.

Operation

Packet-only NITs

Dynamic TEI packet-only NITs are provisioned in SERVORD. This feature creates a prompt for the SLT ADD command for a dynamic TEI packet-only NIT. A PS type of D_Dyn is created to support dynamic TEI packet service. This type is dependent on the LTCLASS = BRAFS and the CS type = N. NITs are provisioned by specifying Y at the DEFLTERM prompt. The dynamic TEI type UNATEI (user-network assigned TEI) is automatically assigned. The TERML option defaults to one, and one is the only valid value. (A value of one is enforced because only one packet-only NIT on a loop can access packet

ISDN Packet NIT Support (continued)

service.) The TERML option restricts the number of NITs that can be associated with an LTID.

> ***Note:*** If you do not specify the DEFLTERM option in table LTDEF, the *static* TEI packet-only terminal is assumed.

The SLT ATT command must be consistent with the SLT ADD provisioning. Do not specify the TEI option with the SLT ATT command if you want a NIT.

The SERVORD SLT ADD and SLT CHA commands automatically update table LTDEF with options DEFLTERM and TERML for packet-only NITs. This feature adds the DEFLTERM and TERML options to table LTDEF for a packet-only NIT.

The SERVORD SLT ATT and SLT DET commands automatically update table LTMAP. Table LTMAP datafill must be consistent with table LTDEF. For a dynamic TEI packet-only NIT, do not specify the TEI option in table LTMAP.

Integrated NITs

To provision an integrated NIT and distinguish it from an integrated FIT, specify Y at the DEFLTERM prompt at the SLT ADD command. The CS type must be NI2, and the PS type must be D. You must also specify the TERML option with a value in the range of 1-8 (1 is the automatic default value).

The SERVORD SLD ADD and SLT CHA commands automatically update table LTDEF with options DEFLTERM and TERML in table LTDEF for integrated NITs. This feature adds the DEFLTERM and TERML options to table LTDEF for an integrated NIT.

The SERVORD SLT ATT and SLT DET commands automatically update table LTMAP. Table LTMAP datafill must be consistent with table LTDEF. For a 2BD integrated NIT, do not specify the TEI option in table LTMAP.

Restriction of NIT LTIDs to a LEN

For both circuit and packet ISDN loops, only one default terminal profile can be attached to an ISDN LEN. This feature enahnces table LTMAP to prevent attachment of a second NIT LTID to a LEN if one is already attached. The following error message displays:

```
Current LEN already has another NIT LTID attached to it
```

The SLT ATT command disallows the attachment of more than one NIT default terminal profile to the same LEN.

NA009 LTID con gurations

This feature creates the following terminal configurations:

- Only one dynamic TEI packet-only NIT can access packet service.
- Only one dynamic TEI integrated NIT can access packet service. Up to eight dynamic TEI integrated NITs have access to voice/circuit service, but only two can access voice/circuit simultaneously.

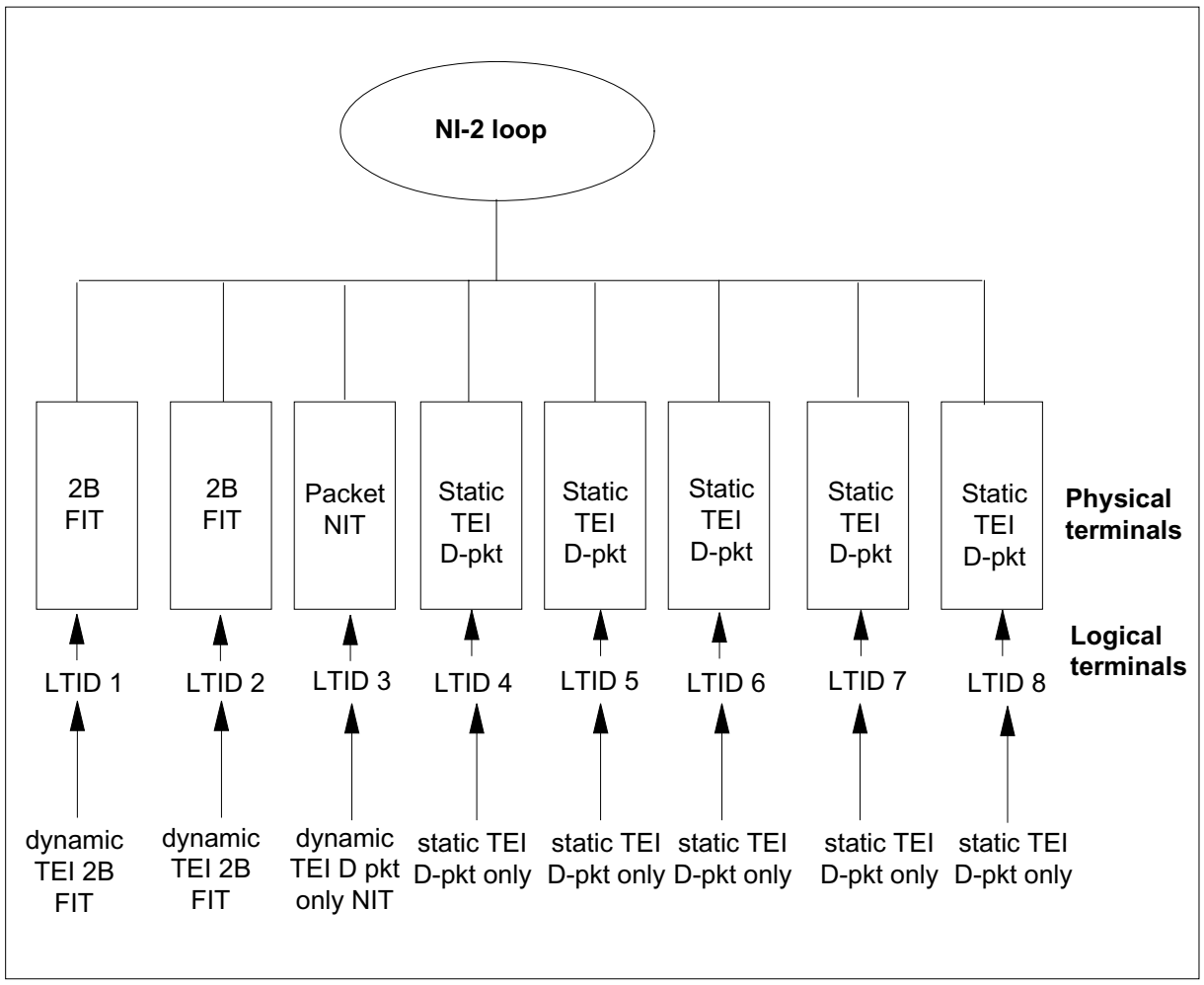
In all the following figures, a maximum of eight terminals (FITs, NITs, static TEI packet terminals, and nailed-up B-channel packet terminals) can exist on a loop. These diagrams are only a sampling of the possible configurations.

The following figure shows the following example NA009 terminal configuration:

- LTIDs 1 and 2: two dynamic TEI 2B FIT LTIDs attached to two 2B FIT terminals
- LTID 3: one dynamic TEI D-packet only NIT LTID attached to one packet NIT terminal
- LTIDs 4-8: five static TEI D-packet only LTIDs attached to five static TEI D-packet terminals

ISDN Packet NIT Support (continued)

NA009 2B FIT, packet D NIT, static TEI packet terminal con guration

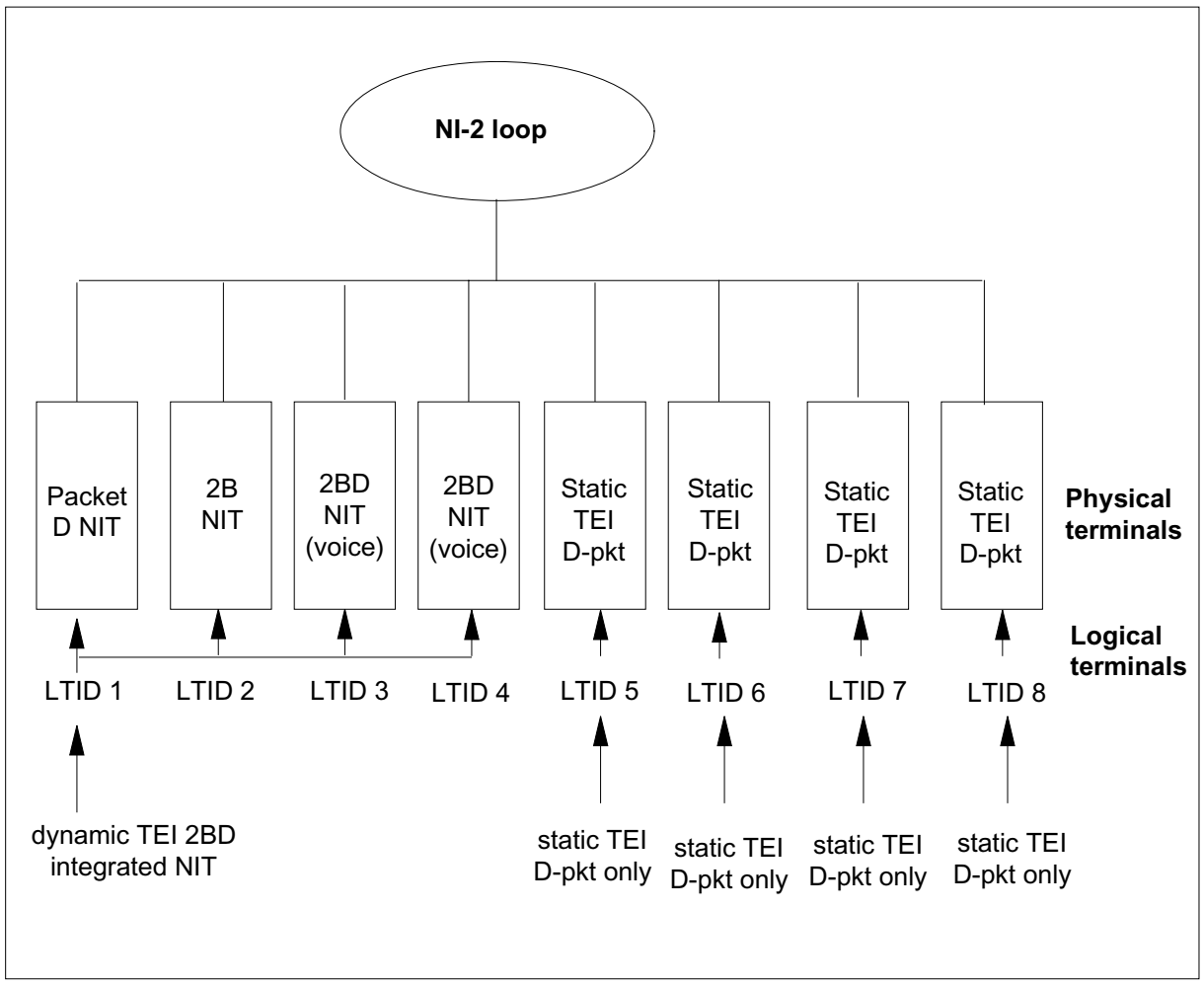


The following figure shows the following example NA009 terminal configuration:

- LTIDs 1-4: one dynamic TEI 2BD integrated NIT attached to one D-packet NIT terminal, one 2B NIT terminal, and two 2BD NIT (voice) terminals
- LTIDs 5-8: four static TEI D-packet only LTIDs attached to four static TEI D-packet terminals

ISDN Packet NIT Support (continued)

NA009 2BD NIT LTID, static TEI packet terminal con guration

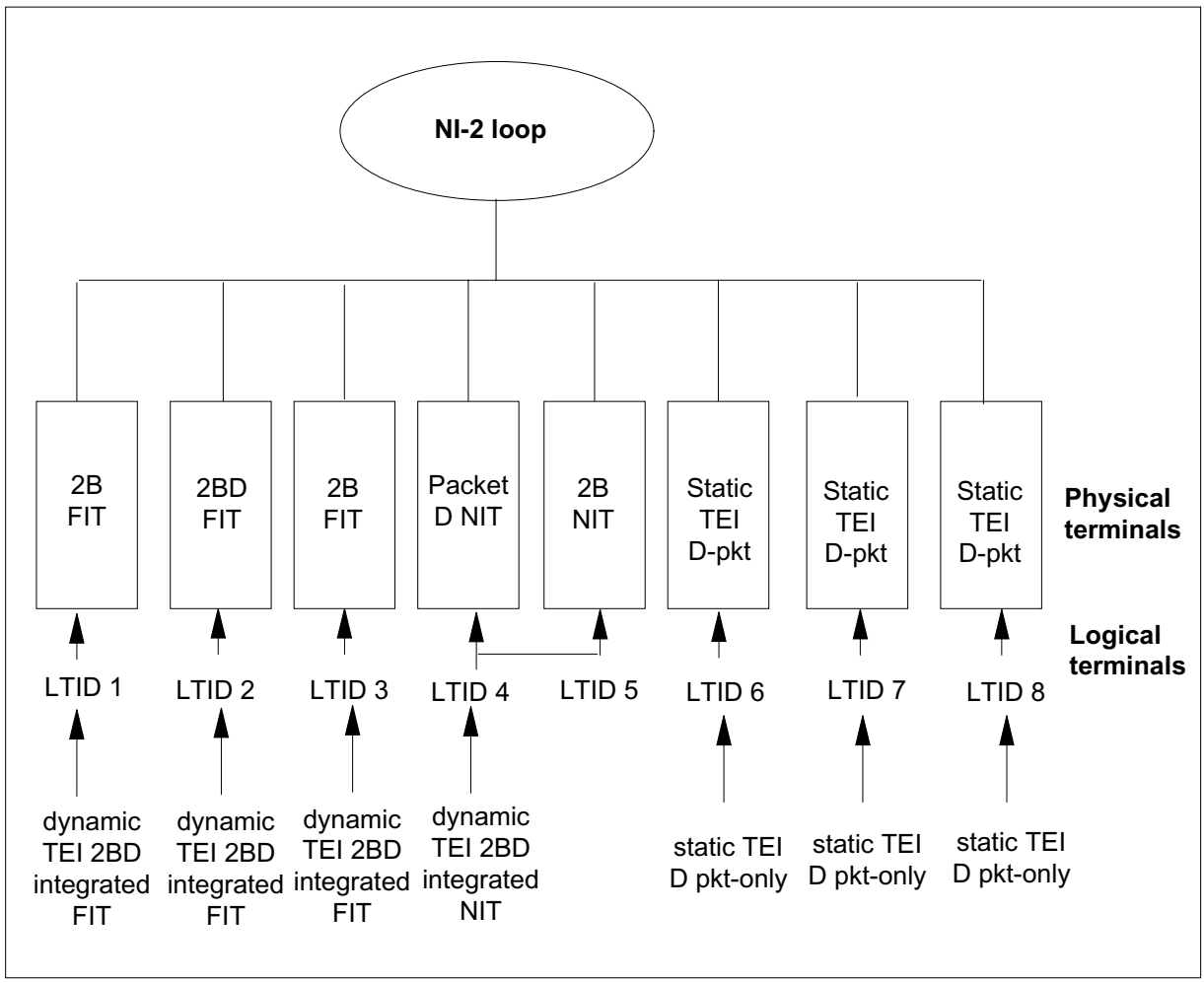


The following figure shows the following example NA009 terminal configuration:

- LTIDs 1-3: three dynamic TEI 2BD integrated FIT LTIDs attached to three FITs (two 2B FITs, one 2BD FIT)
- LTIDs 4-5: one dynamic TEI 2BD integrated NIT LTID attached to two NITs (one D-packet NIT, one 2B NIT)
- LTIDs 6-8: three static TEI D-packet only LTIDs attached to three static TEI D-packet terminals

ISDN Packet NIT Support (continued)

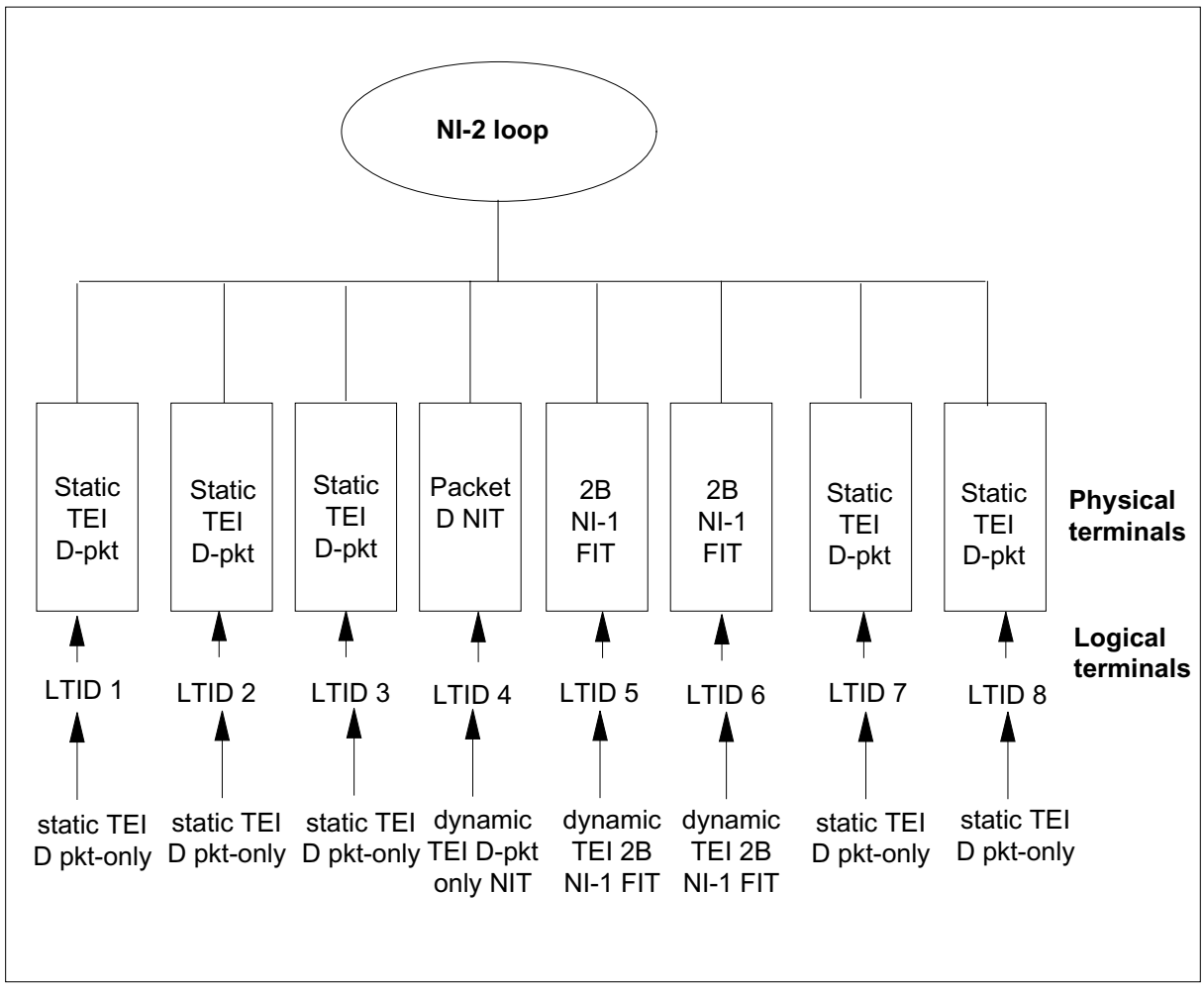
NA009 2BD default LTID and 2BD FIT LTID terminal con guration



The following figure shows the following example NA009 terminal configuration:

- LTIDs 1-3 and 7-8: five static TEI D-packet LTIDs attached to five static TEI D-packet terminals
- LTID 4: one dynamic TEI D-packet only NIT LTID attached to one D-packet only NIT terminal
- LTIDs 5-6: two dynamic TEI 2B NI-1 FIT LTIDs attached to two 2B NI-1 FIT terminals

NA009 NI-1 2B FIT LTID, packet-only NIT LTID terminal con guration

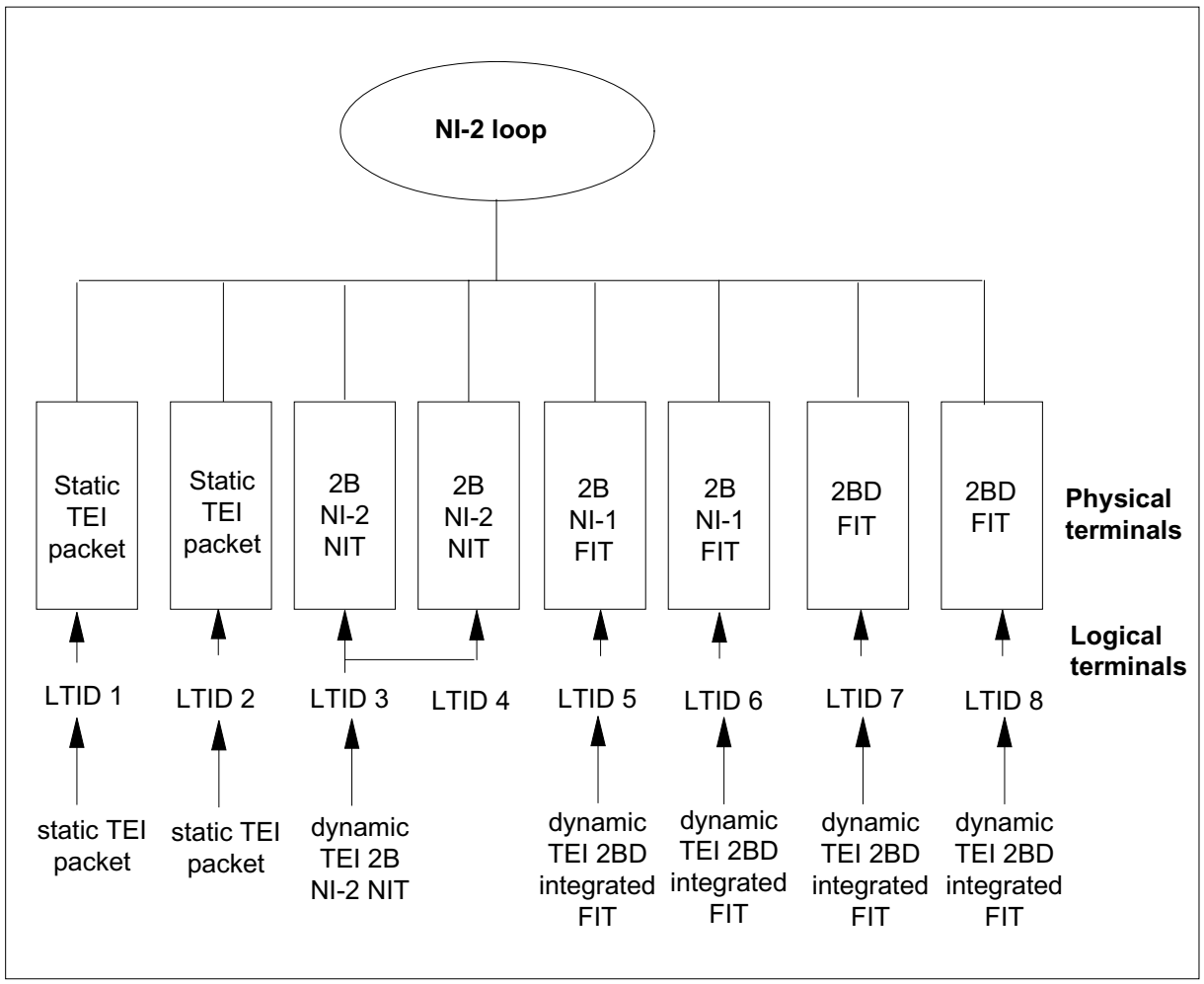


The following figure shows the following example NA009 terminal configuration:

- LTIDs 1-2: two static TEI packet LTIDs attached to two static TEI packet terminals
- LTID 3-4: one dynamic TEI 2B NI-2 NIT LTID attached to two 2B NI-2 NIT terminals
- LTIDs 5-8: four dynamic TEI 2BD integrated FIT LTIDs attached to four FITs (two 2B NI-1 FITs and two 2BD FITs)

ISDN Packet NIT Support (continued)

NA009 2BD FIT, 2B NIT, static D-packet terminal con guration



Translations table o w

The ISDN Packet NIT Support feature does not affect translations table flow.

Limitations and restrictions

The following limitations and restrictions apply to ISDN Packet NIT Support:

- Only one NIT default terminal profile LTID can be provisioned and attached to an ISDN loop (circuit or packet) at any time.
- If the packet NIT is unplugged from the loop, another packet NIT must be manually plugged into the loop if the terminal user wants to continue packet NIT service (unless another packet NIT is already plugged onto the loop).

- If a FIT does not initialize, it will retain association with the NIT default terminal profile until the terminal initializes or is unplugged from the loop. If a FIT does not initialize and a NIT plugs in, the loop behaves as if there were two NITs on the loop.
- The first NIT to send packet data to the switch will receive packet service. Only one dynamic TEI integrated NIT can access packet service.
- Only one dynamic TEI packet-only NIT can be active on a loop.
- Up to eight dynamic TEI integrated NITs have access to voice/circuit service, but only two can access it simultaneously.

Interactions

ISDN Packet NIT Support has no functionality interactions.

Activation/deactivation by the end user

ISDN Packet NIT Support requires no activation or deactivation by the end user.

Billing

ISDN Packet NIT Support does not affect billing.

Station Message Detail Recording

ISDN Packet NIT Support does not affect Station Message Detail Recording.

Data lling of ce parameter s

ISDN Packet NIT Support does not affect office parameters.

Data ll sequence

The following table lists the tables that require datafill to implement ISDN Packet NIT Support. The tables are listed in the order in which they are to be datafilled.

Data ll tab les required for ISDN Packet NIT Support

Table	Purpose of table
LTDEF	Logical Terminal Definition. This table defines the service profile of an ISDN LTID. ***Note:*** This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

ISDN Packet NIT Support (continued)

Translation veri cation tools

ISDN Packet NIT Support does not use translation verification tools.

SERVORD

ISDN Packet NIT Support provisions dynamic TEIs on integrated and packet-only NITs by SERVORD. The SERVORD SLT ADD command automatically updates table LTDEF.

Packet-only NIT

At the SLT ADD command, ISDN Packet NIT Support creates a PS value of D_Dyn to assign a dynamic TEI to integrated and packet-only NITs. Enter Y at the DEFLTERM prompt, and a value of 1 for the TERML option.

Integrated NIT

Enter Y at the DEFLTERM prompt of the SLT ADD command. The TERML option can be in the range of 1-8.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to ISDN Packet NIT Support:

- The SLT ATT command must be consistent with SLT ADD provisioning. Do not specify the TEI option with the SLT ATT command if you want a dynamic TEI.
- The SLT ATT command disallows the attachment of more than one NIT default terminal profile to the same LEN.
- For dynamic TEI packet-only and integrated NITs, do not specify the TEI option in table LTMAP.

SERVORD prompts

The following table shows the SERVORD prompts used to add ISDN Packet NIT Support to an LTID.

SERVORD prompts for ISDN Packet NIT Support (Sheet 1 of 2)

Prompt	Valid input	Explanation
LTID	1 to 8 alphanumeric characters, followed by a space and a terminal number (1 to 1022)	Identifies the logical terminal identifier
FUNCTION	ADD	Specifies the action required by the service order
LTCLASS	BRAFS	Specifies the class of logical terminal based on the type of messaging exchanged between the terminal and the ISDN exchange termination
CS	N, NI2	Indicates whether circuit-switched service is allowed. Enter N for packet-only NITs. Enter NI2 for integrated NITs.
PS	D, D_Dyn	Indicates whether packet-switched service is allowed. Enter D to add dynamic TEI to a 2BD integrated NIT. Enter D_Dyn to add dynamic TEI to a packet-only NIT.
MAXKEYS	2 -64	Specifies the maximum number of feature activators (keys) on a logical terminal used for circuit-switched service
DEFLTERM	Y	Identifies an LTID as a default logical terminal. Enter Y to define a NIT with the default service profile.

ISDN Packet NIT Support (continued)

SERVORD prompts for ISDN Packet NIT Support (Sheet 2 of 2)

Prompt	Valid input	Explanation
OPTION	TERML	Specifies the options assigned to the LTID. Enter TERML for the terminal limit option.
LIMIT	1-8	Indicates the terminal limit. Enter 1 for a packet-only NIT and any value from 1-8 for an integrated NIT to restrict the number of terminals on the loop.

SERVORD example to create an integrated NIT with dynamic TEI

The following SERVORD example shows how to add a dynamic TEI to a 2BD integrated NIT using the SLT ADD command.

SERVORD example for creating a 2BD integrated NIT with dynamic TEI in prompt mode

```
SO:
> SLT
SONUMBER:  NOW 97 1 2 AM
>
LTID:
> PKT 100
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> NI2
PS:
> D
MAXKEYS:
> 64
DEFLTERM:
> Y
OPTION:
> TERML
LIMIT:
> 5
OPTION:
> $
COMMAND AS ENTERED:
SLT NOW 97 1 2 AM PKT 100 ADD BRAFS NI2 D 64 Y TERML 1 $
```

SERVORD example for creating a 2BD integrated NIT with dynamic TEI in no-prompt mode

```
> SLT $ PKT100 ADD BRAFS NI2 D 64 Y TERML 5 $
```

SERVORD example to create a packet-only NIT with dynamic TEI

The following SERVORD example shows how to add a dynamic TEI to a packet-only NIT using the SLT ADD command.

SERVORD example for creating a packet-only NIT with dynamic TEI in prompt mode

```
SO:
> SLT
SONUMBER:  NOW 97 2 2 AM
>
LTID:
> PKT 101
FUNCTION:
> ADD
LTCLASS:
> BRAFS
CS:
> N
PS:
> D_Dyn
MAXKEYS:
> 64
DEFLTERM:
> Y
OPTION:
> TERML
LIMIT:
> 1
OPTION:
> $
COMMAND AS ENTERED:
SLT NOW 97 2 2 AM PKT 101 ADD BRAFS N D_Dyn Y TERML 1 $
```

SERVORD example for creating a packet-only NIT with dynamic TEI in no-prompt mode

```
> SLT $ PKT101 ADD BRAFS N D_Dyn 64 Y TERML 1 $
```

L2/L3 PKT Abnormality Counts and Logs - CM

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA010 and up

L2/L3 PKT Abnormality Counts and Logs - CM was introduced in NA010.

Prerequisites

This document includes all the data table information for this functionality. Complete use of this functionality can require software or hardware not described in this document.

Description

The two B-channels and one D-channel that provide ISDN basic rate interface (BRI) access handle packet data. Signaling on the D-channel uses the protocols specified in the Bellcore technical requirement (TR) for layer 2/3 operation. Layer 2 (data link layer) controls packet data with the link access procedure on the D-channel (LAPD) and link access procedure balanced (LAPB) protocols. Layer 3 (network layer) controls packet data with the X.25 protocol.

Feature L2/L3 PKT Abnormality Counts and Logs - CM provides technicians with surveillance monitoring of layer 2/3 packet abnormalities on the B-channels and D-channel. This feature is part of Bellcore TR 821, a compliance program for the DMS-100 ISDN switch.

To support surveillance monitoring of layer 2/3 packet abnormalities, this feature

- enhances the MAP display of the QCOUNTS command
- adds selections to MAP commands L2LOGCTL and L3LOGCTL
- creates office parameters in tables OFCVAR and ISDNVAR
- adds fields to data schema tables L2ABNLOG and L3ABNLOG

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

Operation

L2/L3 PKT Abnormality Counts and Logs - CM modifies the display and options for the following commands:

- QCOUNTS
- L2LOGCTL
- L3LOGCTL

QCOUNTS is a query command. Use the QCOUNTS command from the CI level or any level of the MAP terminal. L2LOGCTL and L3LOGCTL are LTPISDN level MAP commands.

QCOUNTS

The QCOUNTS command displays protocol and protocol abnormality information for a given logical terminal identifier (LTID). The command allows an end-user to monitor and reset protocol information related to a logical link.

Note: This feature does not change the interface options for the QCOUNTS command.

This feature adds the following information to the QCOUNTS display for layer 2 protocol and abnormality counts of an LTID:

- total frames received
- total frames received in error
- percentage of frames received in error
- total frames transmitted
- total frames re-transmitted
- percentage of frames re-transmitted
- total layer 2 service disruptions
- layer 2 separate protocol abnormality counts for ABN1-ABN10
- total layer 2 high protocol abnormalities

The following example shows layer 2 link-level counts for the LTID CGP 201.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to QCOUNTS for layer 2

```
>QCOUNTS LTID CGP 201 LINK

          LAYER 2 PROTOCOL AND ABNORMALITY COUNTS
          ---------------------------------------
Frames Received:
  I:         1  RR:          8  RNR:         0  SABME:    1
  DM:        0  DISC:        1  UA:          2  FRMR:     0
Frames Received:
  I:         1  RR:          8  RNR:         0  SABME:    1
  DM:        0  DISC:        1  UA:          2  FRMR:     0
Rejects Received:            0   Rejects Transmitted      0
MANAGEMENT DATA LINK ERRORS
---------------------------
  Unsolicited Supervisory Response:              0
  Peer Re-establishment (SABME):                 1
  Unsolicited DM Response (F set):               0
  Unsolicited DM Response (F clear):             0
  Unsolicited UA Response (F set):               0
  Unsolicited UA Response (F clear):             0
  Unsuccessful Re-transmission (SABME):          0
  Unsuccessful Re-transmission (DISC):           0
  Unsuccessful Re-transmission (STATUS):         0
  Receipt of FRMR Response:                      0
  Receipt of Unimplemented Frame:                0
  Receipt of Inforamtion Field not Permitted:    0
  Receipt of Wrong Size Frame:                   0
  N201 Error:                                    0
  N(r) Error:                                    0
  Total Frames Received:                    16
  Total Frames Received in error:            0
  Percentage Frames Received in error:   00.00%
  Total Frames Transmitted:                 15
  Total Frames Re-Transmitted:               0
  Percentage Frames Re-Transmitted:      00.00%
  Layer 2 separate Protocol Abnormality Counts:
  ABN1  ABN2  ABN3  ABN4  ABN5
  ===== ===== ===== ===== =====
     0     0     0     0     0
  ABN6  ABN7  ABN8  ABN9  ABN10
  ===== ===== ===== ===== =====
     0     0     0     0     0
  Total Layer 2 Service Disruptions:         0
  Total Layer 2 High Protocol Agnormalitites:  0
  Counts last reset 1997/10/20 02:07:33
```

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

This feature adds the following information to the QCOUNTS display for layer 3 protocol and abnormality counts of an LTID:

- diagnostic packets sent and received
- restart packets sent and received
- reset packets sent and received
- clear packets sent and received
- layer 3-service disruption counts that includes reset packets transmitted and clear packets transmitted
- total layer 3 service disruptions
- total layer 3 high protocol abnormalities

The following example displays layer 3 packet level counts for the LTID CGP 201.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to QCOUNTS for layer 3

```
>QCOUNTS LTID CGP 201 PACKET

                 LAYER 3 PROTOCOL COUNTS
                 -----------------------
Pakcets Received:
  VC,PVC:    0   RR:          0  RNR:          0  DATA:      1
Pakcets Transmitted:
  VC,PVC:    0   RR:          0  RNR:          0  DATA:      1
Virtual Call Attempts:
  Setup:     0   Originating:       0  Terminating:       0
Unsuccessful Virtual Call Attempts:
  Blocking:          0   Denied     0
  Clearing           0   Overload   0
             LAYER 3 PROTOCOL ABNORMALITY COUNTS
             ----------------------------------
Restart Packets:
  Sent:           2   Received:           0
Reset Packets:
  Sent:           0   Received:           0
Clear Packets:
  Sent:           0   Received:           0
Diagnostic Packets:
  Sent:           0   Received:           0
             LAYER 3 SERVICE DISRUPTION COUNTS
             ---------------------------------
Reset Packets Transmitted:       0
Clear Packets Transmitted:       0
                 LAYER 3 OVERLOAD COUNTS
                 -----------------------
Dynamic Window Congestion:
  local:          0         Remote:         0
Packets dropped due to Layer 3 congestion:
  Link:           0         VC:             0
Packets dropped due to:
  Layer 2:        0         RNR:            0
Layer 3 link queue congestion:              0

Total Layer 3 Service Disruptions:           0
Total Layer 3 High Protocol Abnormalities:   0

  Counts last reset:  1997/10/20  02:07:35
```

L2LOGCTL command

This command allows you to control which ISDN layer 2 abnormality logs the system generates and which logs the system inhibits. You can control the logs

for each line or office-wide. Use this command only to set the log generation parameters for each line. Control the office-wide parameters through table control.

Both the office parameter and the line parameter must be ON to generate a log for a selected line. You can use the selected line's override parameter to override this provision . The inclusion of this parameter allows the generation of log reports for each line instead of for the whole office. There are three options for this command: QUERY, SET, and SETOVR.

L2LOGCTL syntax

The command syntax for the L2LOGCTL command is

L2LOGCTL QUERY <query_type>

L2LOGCTL SET <l2logc_entity> <l2_entity_status>

L2LOGCTL SETOVR <l2_ovr_state>

This feature adds the selections LAPD16 and LAPB to the parameter l2logc_entity of the L2LOGCTL SET command. These parameters allow an end user to control the generation of logs for

- LAPD protocol abnormalities for service access point identifier 16 (SAPI 16) frames
- LAPB protocol abnormalities on B-channel packet data
- Service disruption threshold (SDT) abnormalities

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

L2LOGCTL parameter de nition

The following figure lists the descriptions for the parameter values of the L2LOGCTL QUERY, SET, and SETOVR commands.

L2LOGCTL command parameter

Parameter	Value	Description
query_type	DEF, STATUS	The parameter DEF allows the user to see the meanings of each entity. The parameter STATUS allows the user to see the status of each entity.
l2logc_entity	ALL, LAPD, LAPD16, LAPB, TAA1-TAA7, ABN1-ABN10, SDT	These values allow the user to specify the protocol abnormality log as ON or OFF for the given line. This feature adds parameter value LAPD16 which allows the user to turn ON or OFF all logs related to LAPD16. LAPD16 is for LAPD protocol abnormalities for SAPI 16 frames. This feature adds parameter value LAPB which allows the user to turn ON/OFF all logs related to LAPB. LAPB is for control of LAPB protocol abnormalities on B-channel packet data. This feature adds parameter SDT which allows the user to control the generation of ISDN 305 log reports. The ISDN subsystem generates these log reports when a LEN exceeds the prescribed level of service disruptions defined in parameter LAYER2_SERVICE_DSRPT_THLD in table OFCVAR.
l2_entity_status	ON, OFF	This parameter allows the user to specify if the previous l2logc_entity parameter is set to ON or OFF. This parameter is required.
l2_ovr_state	ON, OFF	This parameter allows the user to specify if the override byte is turned ON or OFF.

L2LOGCTL responses

The following figures are MAP displays affected by this feature when using the L2LOGCTL command.

The following figure shows the MAP response to the HELP L2LOGCTL command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

Map display of response to HELP L2LOGCTL

```
>HELP L2LOGCTL

L2LOGCTL - Used to set the layer 2 log control entities
for the ISDN line posted in the control position of the
MAP.
Parms: [<com_type> {QUERY [<query_type> {DEF,
                                         STATUS}]},
                   {SET [<l2logc_entity> {ALL,
                                          LAPD
                                          TAA1
                                          TAA2
                                          TAA3
                                          TAA4
                                          TAA5
                                          TAA6
                                          TAA7
                                          ABN1
                                          ABN2
                                          ABN3
                                          ABN4
                                          ABN5
                                          ABN6
                                          ABN7
                                          ABN8
                                          ABN9
                                          ABN10
                                          LAPD16
                                          LAPB
                                          SDT}
                    <l2_entity_status>    {ON
                                           OFF},
                    SETOVR <l2_ovr_state> {ON
                                           OFF}}
```

The following figure shows the MAP response to the L2LOGCTL QUERY DEF command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. This command queries the definition of layer 2 abnormality log entities.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the L2LOGCTL QUERY DEF command

```
>L2LOGCTL QUERY DEF

Layer 2 Abnormality Log Entity Definition
Override: the override bit
LAPD:   LAPD protocol
TAA1:   subscription limits exceeded
TAA2:   no terminal response
TAA3:   routine test
TAA4:   multiple TEI response
TAA5:   identify verify message
TAA6:   unsolicited response
TAA7:   TEI not assigned
ABN1:   DM frame rcvd in response to a SABME frame
ABN2:   DM frame sent in response to a SABME frame rcvd
ABN3:   frames rcvd with undefined control field
ABN4:   frames rcvd with invalid info field or incorrect length
ABN5:   frame rcvd with invalid receive seq num
ABN6:   frames rcvd with info field over max length
ABN7:   unexpected frames received
ABN8:   FRMR frame received
ABN9:   proper response not rcvd after SABME frame sent
ABN10:  other invalid frames received – non FCS error
LAPD16: LAPD protocol on SAPI16 frames
LAPB:   LAPB protocol on B-channel data
SDT:    service disruption threshold - limit exceeded
```

The following figure shows the MAP response to the L2LOGCTL QUERY STATUS command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. This command queries the status of log control information for the posted line.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the L2LOGCTL QUERY STATUS command

```
>L2LOGCTL QUERY STATUS

Loop Layer 2 Abnormality Log Reporting Status:
Override: OFF
LAPD TAA1 TAA2 TAA3 TAA4 TAA5 TAA6 TAA7
ON   ON   OFF  ON   OFF  ON   ON   OFF
ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7 ABN8 ABN9 ABN10 LAPD16 LAPB SDT
OFF  ON   ON   ON   OFF  ON   ON   OFF  OFF  ON    OFF    OFF  ON

Office Layer 2 Abnormality Log Reporting Status:
LAPD TAA1 TAA2 TAA3 TAA4 TAA5 TAA6 TAA7
OFF  ON   ON   OFF  OFF  ON   OFN  OFF
ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7 ABN8 ABN9 ABN10 LAPD16 LAPB SDT
ON   OFF  ON   OFF  ON   ON   OFF  ON   OFF  OFF   OFF    OFF  OFF
```

The following figure shows the MAP response to the L2LOGCTL SET ABN1 OFF command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. The following example displays the LAPD16 and LAPB protocol fields added by this feature.

MAP display of response to the L2LOGCTL SET ABN1 OFF command

```
>L2LOGCTL SET ABN1 OFF

Loop Layer 2 Abnormality Log Reporting Status:
Override: OFF
LAPD TAA1 TAA2 TAA3 TAA4 TAA5 TAA6 TAA7
ON   ON   ON   ON   ON   ON   ON   ON
ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7 ABN8 ABN9 ABN10 LAPD16 LAPB SDT
OFF  ON   ON   ON   ON   ON   ON   ON   ON   ON    ON     ON   ON

Office Layer 2 Abnormality Log Reporting Status:
LAPD TAA1 TAA2 TAA3 TAA4 TAA5 TAA6 TAA7
ON  ON   ON   ON   ON   ON   OFF  OFF
ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7 ABN8 ABN9 ABN10 LAPD16 LAPB SDT
OFF  ON   ON   ON   ON   ON   ON   ON   ON   ON    ON     ON   ON
```

The following figure shows the MAP response to the L2LOGCTL SETOVR ON command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. The following example displays the LAPD16 and LAPB protocol fields added by this feature.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the L2LOGCTL SETOVR ON command

```
>L2LOGCTL SETOVR ON

Loop Layer 2 Abnormality Log Reporting Status:
Override: ON
LAPD TAA1 TAA2 TAA3 TAA4 TAA5 TAA6 TAA7
ON   ON   OFF  ON   OFF  ON   ON   OFF
ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7 ABN8 ABN9 ABN10 LAPD16 LAPB SDT
OFF  OFF  ON   ON   ON   OFF  ON   ON   OFF  OFF   OFF    OFF  OFF

Office Layer 2 Abnormality Log Reporting Status:
LAPD TAA1 TAA2 TAA3 TAA4 TAA5 TAA6 TAA7
OFF  OFF    OFF  ON   ON   OFF  OFF  ON   ON   OFF
ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7 ABN8 ABN9 ABN10 LAPD16 LAPB SDT
OFF  OFF  ON   OFF  ON   ON   OFF  ON   OFF  OFF   OFF    OFF  OFF
```

L2LOGCTL command usage

The following examples list steps for using the L2LOGCTL command. Each example shows how to enable or disable the generation of logs. In all examples, ABN1 is a sample entity and LAPD16 and LAPB are given as selections for the required protocol.

Turn ON/OFF a single log on an individual line To turn off a log:

1. Post the line with the desired log.
2. Turn on the required protocol (LAPD16 or LAPB).
3. Use L2LOGCTL SET ABN1 OFF to turn off the log. Turning off the log inhibits log generation.

There are two methods to turn on a log. Use the following method when the entity is ON for the office in general.

1. Post the line with the desired log.
2. Turn on the required protocol (LAPD16 or LAPB).
3. Use the command L2LOGCTL SET ABN1 ON to turn on the log for the individual line.

Use the following method when the entity is OFF for the office in general:

1. Post the line with the desired log.
2. Turn on the required protocol (LAPD16 or LAPB).

3. Use L2LOGCTL SETOVR ON to turn on the override bit for the line.
4. Use L2LOGCTL SET ABN1 ON to turn on the log.

Turn ON/OFF all logs for an individual line To turn off all the separate entities for a line:

1. Post the line with the desired logs.
2. Use L2LOGCTL SET ALL OFF to turn off all the logs.

There are two ways to turn on all entities. When all office log entities are ON:

1. Post the line with the desired logs.
2. Turn on the required protocol (LAPD16 or LAPB).
3. Use L2LOGCTL SET ALL ON to turn on all the logs.

When any office entities are OFF:

1. Post the line with the desired logs.
2. Turn on the required protocol (LAPD16 or LAPB).
3. Use L2LOGCTL SETOVR ON to turn on the override bit.
4. Use L2LOGCTL SET ALL ON to turn on all the logs.

Turn ON/OFF a single log of ce wide To turn OFF an entity office wide, turn OFF the entity using table control:

1. Go to table ISDNVAR
2. Set ABN1 to OFF.

> ***Note:*** The preceding steps do not turn off logs from lines with both their override bit and their ABN1 entity set to ON. To turn off the ABN1 logs for these lines, turn off the override bit separately.

To turn on logs for lines with their ABN1 entity set to ON, turn on the log control entity in table ISDNVAR:

1. Go to table ISDNVAR
2. Set ABN1 to ON.

To turn on the ABN1 entity, refer to “Turn ON/OFF a single log on an individual line."

Turn ON/OFF all logs of ce wide To turn off the log entities for the office, turn off the value for the log entities in table ISDNVAR. This only turns

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

off the logs for lines where the override bits are OFF. Lines with override bits set to ON generate logs for all abnormalities where the corresponding log entities are ON.

Note: To turn off all logs, either turn off all override bits or turn off all the log entities for all lines.

To turn on all logs entities, set all layer 2 log entities in table ISDNVAR to ON. Lines with separate entities set to OFF do not generate logs for those entities.

Note: Before all layer 2 logs can turn on for all office lines, issue the L2LOGCTL SET ALL ON command.

L3LOGCTL command

The L3LOGCTL command allows the user to control ISDN layer 3 abnormality logs for a posted ISDN line.

Modifications to the L3LOGCTL command add the following selections:

- PKT
- ABN14
- ABN15
- ABN16
- ABN17
- ABN18
- ABN19
- ABN20
- ABN21

The preceding parameters allow an end user to control the generation of layer 3 abnormality logs for an ISDN line. Q.931 is an existing protocol selection for the L3LOGCTL command. PKT is a protocol selection added by this feature.

L3LOGCTL syntax

The command syntax for the L3LOGCTL command is

L3LOGCTL QUERY <query_type>

L3LOGCTL SET <l3logc_entity> <l3_entity_status>

L3LOGCTL SETOVR <l3_ovr_state>

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

This feature adds the following selections to the l3logc_entity parameter of the L3LOGCTL SET command:

- PKT
- ABN14-ABN21

L3LOGCTL parameter de nition

The following figure lists the descriptions for the parameter values of the L3LOGCTL QUERY, SET, and SETOVR commands.

L3LOGCTL command parameters

Parameter	Value	Description
query_type	DEF, STATUS	The parameter DEF allows the user to see the meanings of each entity. The parameter STATUS allows the user to see the status of each entity.
l3logc_entity	ALL, Q931, ABN1-ABN13, PKT, ABN14-ABN21	Enter a parameter after the L3LOGCTL SET command. The parameter values allow the user to turn ON/OFF each entity. This feature adds the parameter value PKT which allows the user to turn ON/OFF all logs related to X.25-packet data. This feature adds the parameter values ABN14-ABN21 which allow the user to turn ON/OFF the separate packet abnormality logs.
l3_entity_status	ON, OFF	This parameter allows the user to specify if the previous l3logc_entity parameter is set to ON/OFF. This parameter is required.
l3_ovr_state	ON, OFF	This parameter allows the user to specify if the override byte is turned ON/OFF.

L3LOGCTL responses

The following examples are MAP displays affected by this feature when using the L3LOGCTL command.

The following figure shows the MAP response to the HELP L3LOGCTL command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the HELP L3LOGCTL command

```
>HELP L3LOGCTL
L3LOGCTL - Used to set the layer 3 log control entities
for the ISDN line posted in the control position of the MAP.
Parms: [<com_type> {QUERY [<query_type> {DEF,
                                         STATUS}]},
                   {SET [<l3logc_entity> {ALL,
                                          Q931
                                          ABN1
                                          ABN2
                                          ABN3
                                          ABN4
                                          ABN5
                                          ABN6
                                          ABN7
                                          ABN8
                                          ABN9
                                          ABN10
                                          ABN11
                                          ABN12
                                          ABN13
                                          PKT
                                          ABN14
                                          ABN15
                                          ABN16
                                          ABN17
                                          ABN18
                                          ABN19
                                          ABN20
                                          ABN21
                                <l3_entity_status> {ON,
                                                    OFF}]},
                   {SETOVR [<l3_ovr_state> {ON,
                                            OFF}]}]
```

The following figure shows the MAP response to the L3LOGCTL QUERY DEF command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. This command displays the definitions for layer 3 abnormality log entities.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the L3LOGCTL QUERY DEF command

```
>L3LOGCTL QUERY DEF

Layer 3 Abnormality Log Entity Definitions
Override: the override bit
Q931 : Q.931
abn1 : DISCONNECT received
abn2 : DISCONNECT transmitted
abn3 : RELEASE received
abn4 : RELEASE transmitted
abn5 : RELEASE COMP received
abn6 : RELEASE COMP transmitted
abn7 : Status message received
abn8 : Status message transmitted
abn9 : Progress message transmitted
abn10: msg rcvd less than minimum length
abn11: msg rcvd with invalid protocol discriminator info
abn12: msg rcvd with invalid call ref value
abn13: SETUP msg rcvd with cal ref flag incorrectly set to 1
PKT  : Packet
abn14: Restart request transmitted
abn15: Restart request received
abn16: Reset request transmitted
abn17: Reset request received
abn18: Clear request transmitted
abn19: Clear request received
abn20: Diagnostic packet transmitted
abn21: Diagnostic packet received
```

The following figure shows the MAP response to the L3LOGCTL QUERY STATUS command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. This command displays the layer 3 abnormality log entity status.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the L3LOGCTL QUERY STATUS command

```
>L3LOGCTL QUERY STATUS

Loop Layer 3 Abnormality Log Reporting Status:
Override: OFF
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9
OFF   ON    ON    ON    OFF   ON    ON    OFF   OFF   OFF
ABN10 ABN11 ABN12 ABN13 PKT ABN14 ABN15 ABN16 ABN17 ABN18 ABN19
OFF   ON    ON    OFF   ON  ON    OFF   ON    OFF   ON    OFF
ABN20 ABN21
ON    OFF
Office Layer 3 Abnormality Log Reporting Status:
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9
ON    ON    ON    ON    OFF   ON    ON    OFF   OFF   OFF
ABN10 ABN11 ABN12 ABN13 PKT ABN14 ABN15 ABN16 ABN17 ABN18 ABN19
OFF   ON    ON    OFF   ON  ON    OFF   ON    OFF   ON    OFF
ABN20 ABN21
ON    OFF
```

The following figure shows the MAP response to the L3LOGCTL SET ABN2 OFF command. This command sets and displays the layer 3 abnormality log entity for ABN2. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. The following example displays the PKT protocol field and the ABN14-ABN21 fields added by this feature.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the L3LOGCTL SET ABN2 OFF command

```
>L3LOGCTL SET ABN2 OFF

Loop Layer 3 Abnormality Log Reporting Status:
Override: OFF
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9
OFF   ON    OFF   ON    OFF   ON    ON    OFF   OFF   OFF
ABN10 ABN11 ABN12 ABN13 PKT ABN14 ABN15 ABN16 ABN17 ABN18 ABN19
OFF   ON    ON    OFF   ON  ON    OFF   ON    OFF   ON    OFF
ABN20 ABN21
ON    OFF
Office Layer 3 Abnormality Log Reporting Status:
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9
ON    ON    ON    ON    OFF   ON    ON    OFF   OFF   OFF
ABN10 ABN11 ABN12 ABN13 PKT ABN14 ABN15 ABN16 ABN17 ABN18 ABN19
OFF   ON    ON    OFF   ON  ON    OFF   ON    OFF   ON    OFF
ABN20 ABN21
ON    OFF
```

The following figure shows the MAP response to the L3LOGCTL SETOVR ON command. This command sets the override bit for the line. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. The following example displays the PKT protocol field and the ABN14-ABN21 fields added by this feature.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display of response to the L3LOGCTL SETOVR ON command

```
>L3LOGCTL SETOVR ON

Loop Layer 3 Abnormality Log Reporting Status:
Override: ON
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9
OFF   ON    ON    ON    OFF   ON    ON    OFF   OFF   OFF
ABN10 ABN11 ABN12 ABN13 PKT ABN14 ABN15 ABN16 ABN17 ABN18 ABN19
OFF   ON    ON    OFF   ON  ON    OFF   ON    OFF   ON    OFF
ABN20 ABN21
ON    OFF
Office Layer 3 Abnormality Log Reporting Status:
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9
ON    ON    ON    ON    OFF   ON    ON    OFF   OFF   OFF
ABN10 ABN11 ABN12 ABN13 PKT ABN14 ABN15 ABN16 ABN17 ABN18 ABN19
OFF   ON    ON    OFF   ON  ON    OFF   ON    OFF   ON    OFF
ABN20 ABN21
ON    OFF
```

L3LOGCTL command usage

The following examples list steps for using the L3LOGCTL command. Each example shows how to enable or disable the generation of logs. In all of the examples, ABN21 a sample entity and PKT is the sample protocol.

Note: Logs ABN1 through ABN13 are related to Q.931 protocol errors. Logs ABN14 through ABN21 are related to PKT errors.

Turn ON/OFF a single log on an individual line To turn off a log:

1. Post the line with the desired log.
2. Type L3LOGCTL SET PKT ON. This command turns on PKT log control.
3. Type L3LOGCTL SET ABN21 OFF. This command disables the generation of the log.

There are two methods to turn on a log. When the entity is ON for the office in general:

1. Post the line with the desired log.
2. Turn on the PKT log entity.
3. Use the command L3LOGCTL SET ABN21 ON to turn on the log for the individual line.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

When the entity is OFF for the office in general:

1. Post the line with the desired log.
2. Turn on log control entity PKT.
3. Use L3LOGCTL SETOVR ON to turn on the override bit for the line.
4. Use L3LOGCTL SET ABN21 ON to turn on the log.

Turn ON/OFF all logs for an individual line To turn OFF all the separate entities for a line:

1. Post the line with the desired logs.
2. Use L3LOGCTL SET ALL OFF to turn off all the logs.

There are two ways to turn on all entities. When all office log-control entities are ON:

1. Post the line with the desired logs.
2. Turn on log control entity PKT.
3. Use L3LOGCTL SET ALL ON to turn on all the logs.

When any office entities are OFF:

1. Post the line with the desired logs.
2. Turn on log control entity PKT.
3. Use L3LOGCTL SETOVR ON to turn on the override bit.
4. Use L3LOGCTL SET ALL ON to turn on all the logs.

Turn ON/OFF a single log of ce wide Use table control to turn off an entity office wide:

1. Go to table ISDNVAR.
2. Set ABN21 to OFF.

> ***Note:*** The preceding steps do not turn off logs from lines with both their override bit and their ABN21 entity set to ON. To turn off the ABN21 logs for these lines, turn off the override bit separately.

To turn on logs for lines with their ABN21 entity set to ON, turn on the log control entity in table ISDNVAR:

1. Go to table ISDNVAR.
2. Set ABN21 to ON.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

To turn on the ABN21 entity set to OFF, refer to “Turn ON/OFF a single log on an individual line."

Turn ON/OFF all logs of ce wide To turn off the log entities for the office, set the value for the log entities in table ISDNVAR to OFF. This only turns off the logs for lines that have their override bit set to OFF. Lines with their override bit set to ON continue to generate logs for all abnormalities where the corresponding log entities are ON.

Note: To turn off all logs, either turn off all override bits or turn off all the log entities for all lines.

To turn on all logs entities, set all layer 3 log control entities in table ISDNVAR to ON. Lines with separate entities set to OFF do not generate logs for those entities.

Note: Before all layer 3 logs can turn on for all office lines, issue the L3LOGCTL SET ALL ON command.

Translations table o w

L2/L3 PKT Abnormality Counts and Logs - CM does not affect translations.

Limitations and restrictions

The following limitations and restrictions apply to L2/L3 PKT Abnormality Counts and Logs - CM:

- All counters are provided for each packet LTID.
- The maximum size for all counters to receive or transmit frames is 32 bits.

This feature does not support

- access to counters and logs through the operating system
- the “leaky bucket approach" for counters of layer 2 service disruption monitoring
- the guarantee of log report storage over 24 h
- the resetting separate counters
- primary rate interface (PRI) packets

Interactions

L2/L3 PKT Abnormality Counts and Logs - CM has no functionality interactions.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

Activation/deactivation by the end user

L2/L3 PKT Abnormality Counts and Logs - CM requires no activation or deactivation by the end user.

Billing

L2/L3 PKT Abnormality Counts and Logs - CM does not affect billing.

Station Message Detail Recording

L2/L3 PKT Abnormality Counts and Logs - CM does not affect Station Message Detail Recording.

Data lling of ce parameter s

The following table lists the office parameters introduced by L2/L3 PKT Abnormality Counts and Logs - CM. For more information about office parameters, refer to *Office Parameters Reference Manual*.

Of ce parameter s used by L2/L3 PKT Abnormality Counts and Logs - CM (Sheet 1 of 4)

Table name	Parameter name	Explanation and action
OFCVAR	LAYER2_SERVICE_ DSRPT_THLD	This parameter indicates the threshold value for line equipment number (LEN) service disruptions. The monitored errors are the number of layer 2 resets and the number of overflows of the received frame buffer. Log report ISDN305 generates if the count of service disruptions exceeds the value set for this parameter. The default value for this parameter is 4. Set the value of this parameter to fall within the range of 1-100.
OFCVAR	LAYER3_PACKET_ SVC_THLD	This parameter sets the threshold value for layer 3 service disruptions of X.25-packet data over a 24-h period. Log report ISDN309 generates if the count of service disruptions exceeds the value set for this parameter. The default value for this parameter is 4. Set the value of this parameter during a time when an audit is not active. The range for this value is 1-1000.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

Of ce parameter s used by L2/L3 PKT Abnormality Counts and Logs - CM (Sheet 2 of 4)

Table name	Parameter name	Explanation and action
ISDNVAR	LAPD16_ABN_LOG	Use this parameter to enable or disable the generation of LAPD16 abnormality log reports office wide. Use table control to turn on this parameter. Turning on this parameter enables the generation of LAPD16 abnormality log reports office wide. Use table control to turn off this parameter. Turning off this parameter disables the generation of LAPD16 abnormality log reports office wide.
ISDNVAR	LAPB_ABN_LOG	This parameter enables or disables the generation LAPB abnormality log reports office wide. OFF is the default value. Leave this parameter OFF to disable the generation of LAPB abnormality log reports office wide. Use table control to turn on this parameter. Turning on this parameter enables the generation of LAPB abnormality log reports office wide.
ISDNVAR	PKT_ABN_LOG	This parameter enables or disables the generation X.25-packet data abnormality log reports office wide. OFF is the default value. Leave this parameter OFF to inhibit the generation of LAPB abnormality log reports office wide. Use table control to turn on this parameter. Turning on this parameter makes possible the generation of LAPB abnormality log reports office wide.
ISDNVAR	L3_RESTART_REQ_ TRANS	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “RESTART REQUEST transmitted". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type "RESTART REQUEST transmitted".

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

Of ce parameter s used by L2/L3 PKT Abnormality Counts and Logs - CM (Sheet 3 of 4)

Table name	Parameter name	Explanation and action
ISDNVAR	L3_RESTART_REQ_ RCVD	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “RESTART REQUEST received". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type “RESTART REQUEST received".
ISDNVAR	L3_RESET_REQ_ TRANS	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “RESET INDICATION transmitted". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type “RESET INDICATION transmitted".
ISDNVAR	L3_RESET_REQ_ RCVD	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “RESET REQUEST received". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type “RESET REQUEST received".
ISDNVAR	L3_CLEAR_REQ_ TRANS	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “CLEAR INDICATION transmitted". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type “CLEAR INDICATION transmitted".
ISDNVAR	L3_CLEAR_REQ_ RCVD	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “CLEAR REQUEST received". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type “CLEAR REQUEST received".

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

Of ce parameter s used by L2/L3 PKT Abnormality Counts and Logs - CM (Sheet 4 of 4)

Table name	Parameter name	Explanation and action
ISDNVAR	L3_DIAG_PKT_TRANS	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “DIAGNOSTIC transmitted". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type “DIAGNOSTIC transmitted ".
ISDNVAR	L3_DIAG_PKT_RCVD	This parameter enables or disables the generation of layer 3 abnormality log reports for X.25-packet data. The layer 3 log reports display with the abnormality type “DIAGNOSTIC received". The default value of this parameter is ON. The ON value allows the generation of log reports with the abnormality type “DIAGNOSTIC received".
ISDNVAR	SDT_SUBSCRIPTION_ LIMIT_EXCD	This parameter controls the generation of ISDN 305 layer 2 abnormality log reports for the office. The ISDN subsystem generates these layer 2 log reports with the abnormality type “Service Disruption Exceeded". OFF is the default value. Leave this parameter OFF to prevent the generation of ISDN 305 abnormality log reports. Use table control to turn on this parameter. To generate ISDN 305 log reports office wide, set this parameter to ON.

Data ll sequence

The following table lists the tables that require datafill to implement L2/L3 PKT Abnormality Counts and Logs - CM. The tables are listed in the order in which they are to be datafilled.

Data ll tab les required for L2/L3 PKT Abnormality Counts and Logs - CM

Table	Purpose of table
L2ABNLOG	Layer 2 Abnormality Log Control contains the reporting status for layer 2 log reports for individual ISDN lines.
L3ABNLOG	Layer 3 Abnormality Log Control contains the reporting status for layer 3 log reports for individual ISDN lines.

Data lling tab le L2ABNLOG

The following table shows the datafill specific to L2/L3 PKT Abnormality Counts and Logs - CM for table L2ABNLOG. The fields that apply directly to L2/L3 PKT Abnormality Counts and Logs - CM are shown. For a description of the other fields, refer to the data schema section of this document.

Table L2ABNLOG stores the reporting status for layer 2 controllable log reports for individual ISDN lines. Entries appear in this table only if they override the default status set for these log reports in table ISDNVAR.

Data lling tab le L2ABNLOG

Field	Subfield or refinement	Entry	Explanation and action
LAPD16		ON or OFF	Link access procedure on the D-channel for service access point identifier 16 frames (LAPD16). Report generation status for LAPD16 log reports. The ON entry turns on the generation of LAPD16 log reports. The OFF entry turns off the generation of LAPD16 log reports.
LAPB		ON or OFF	Link access procedure balanced (LAPB). Report generation status for LAPB log reports. The ON entry turns on the generation of LAPB log reports. The OFF entry turns off the generation of LAPB log reports.
SDT		ON or OFF	Service disruption threshold (SDT). Status of line-based control of ISDN 305 abnormality log report that indicates: Service Disruption Exceeded. Enter ON to activate line-based control for service disruption threshold - limit exceeded. Enter OFF to disable line-based control for service disruption threshold - limit exceeded.

Data ll e xample for table L2ABNLOG

The following example shows sample datafill for table L2ABNLOG.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

MAP display example for table L2ABNLOG

```
HOST LEN     OVR LAPD TAA1 TAA2 TAA3 TAA4 TAA5 TAA6
_____________________________________________________
(02 1 04 02) OFF ON   ON   OFF  ON   ON   ON   ON

TAA7 ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7 ABN8 ABN9 ABN10
_____________________________________________________
OFF  ON   ON   ON   OFF  OFF  ON   ON   ON   ON   ON

LAPD16 LAPB SDT
_______________
OFF    OFF  ON
```

Data lling tab le L3ABNLOG

The following table shows the datafill specific to L2/L3 PKT Abnormality Counts and Logs - CM for table L3ABNLOG. The fields that apply directly to L2/L3 PKT Abnormality Counts and Logs - CM are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le L3ABNLOG (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
PKT		ON or OFF	Protocol abnormalities for X.25 packet (PKT) data. Report generation status for PKT data log reports. The ON entry turns on the generation of PKT data log reports. The OFF entry turns off the generation of PKT data log reports.
ABN14		ON or OFF	Abnormality 14. Report status for the generation of log reports that indicate “RESTART REQUEST transmitted" for an individual line. The ON entry turns on individual line control for ABN14 log report generation. The OFF entry turns off individual line control for ABN14 log report generation.

Data lling tab le L3ABNLOG (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
ABN15		ON or OFF	Abnormality 15. Report status for the generation of log reports that indicate “RESTART REQUEST received" for an individual line. The ON entry turns on individual line control for ABN15 log report generation. The OFF entry turns off individual line control for ABN15 log report generation.
ABN16		ON or OFF	Abnormality 16. Report status for the generation of log reports that indicate “RESET INDICATION transmitted". The ON entry turns on individual line control for ABN16 log report generation. The OFF entry turns off individual line control for ABN16 log report generation.
ABN17		ON or OFF	Abnormality 17. Report status for the generation of log reports that indicate “RESET REQUEST received" for an individual line. The ON entry turns on individual line control for ABN17 log report generation. The OFF entry turns off individual line control for ABN17 log report generation.
ABN18		ON or OFF	Abnormality 18. Report status for the generation of log reports that indicate “CLEAR INDICATION transmitted" for an individual line. The ON entry turns on individual line control for ABN18 log report generation. The OFF entry turns off individual line control for ABN18 log report generation.
ABN19		ON or OFF	Abnormality 19. Report status for the generation of log reports that indicate “CLEAR REQUEST received" for an individual line. The ON entry turns on individual line control for ABN19 log report generation. The OFF entry turns off individual line control for ABN19 log report generation.

L2/L3 PKT Abnormality Counts and Logs - CM (continued)

Data lling tab le L3ABNLOG (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
ABN20		ON or OFF	Abnormality 20. Report status for the generation of log reports that indicate “DIAGNOSTIC transmitted" for an individual line. The ON entry turns on individual line control for ABN20 log report generation. The OFF entry turns off individual line control for ABN20 log report generation.
ABN21		ON or OFF	Abnormality 21. Report status for the generation of log reports that indicate “DIAGNOSTIC received" for an individual line. The ON entry turns on individual line control for ABN20 log report generation. The OFF entry turns off individual line control for ABN21 log report generation.

Data ll e xample for table L3ABNLOG

The following example shows sample datafill for table L3ABNLOG.

MAP display example for table L3ABNLOG

```
HOST LEN    OVR Q931 ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7
_____________________________________________________
(02 1 04 02) OFF ON   ON   ON  OFF  ON   ON   ON   ON

ABN8 ABN9 ABN10 ABN11 ABN12 ABN13 PKT ABN14 ABN15 ABN16
_____________________________________________________
ON   OFF  OFF   ON    ON    ON    OFF ON    ON    ON

ABN17 ABN18 ABN19 ABN20 ABN21
_____________________________
ON    ON    ON    ON    ON
```

Translation veri cation tools

L2/L3 PKT Abnormality Counts and Logs - CM does not use translation verification tools.

L2/L3 PKT Abnormality Counts and Logs - CM (end)

SERVORD

L2/L3 PKT Abnormality Counts and Logs - CM does not use SERVORD.

Layer 3 Service Disruption

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA012 and up

NA012 introduced Layer 3 Service Disruption.

Requirements

Layer 3 Service Disruption has no functional group requirements.

Description

Layer 3 Service Disruption provides operating companies with layer 3 service disruption reports for basic rate interface (BRI) circuit-switched services for the DMS-100 switch. This integrated services digital network (ISDN) feature is part of the NI-2 compliance program for the DMS-100 switch. This feature includes the computing module (CM) changes required to support the following capabilities:

- counts of ISDN BRI layer 3 service disruptions
- logging layer 3 service disruption threshold exceeded
- logging layer 3 service disruption counter capacity exceeded
- layer 3 service disruption threshold log control
- layer 3 service disruption count access and reset

Layer 3 Service Disruption depends on XMS-based peripheral module (XPM) activity to provide layer 3 abnormality reports. These real-time reports describe signaling conditions that cause layer 3 service disruptions.

Operation

The XPM detects ISDN layer 3 signaling conditions that cause D-channel service disruptions on a BRI. The XPM then sends a record of the service disruption to the CM, which increments the layer 3 service disruption counter. The CM compares the count with the provisioned threshold value for layer 3 service disruption. The CM also generates a log to alert the technician when the count exceeds the threshold value. From the MAP (maintenance and administration position) terminal, the technician can query or reset the layer 3 service disruption counter maintained for each ISDN BRI line.

Layer 3 Service Disruption (continued)

The CM generates one threshold log for each ISDN BRI line in a 60-minute interval. The CM generates the service disruption log at the instant when the counter exceeds the threshold value. The CM then generates no additional threshold exceeded logs for that 60-minute interval. But the CM does not prevent additional counts after the count exceeds the threshold value. If the counter reaches its maximum capacity, the CM generates no additional increments and generates a counter capacity reached log. The CM generates the threshold exceeded log if the log control mechanism does not inhibit this log.

The operating elements of this feature are:

- The enhancement of MAP commands to include the new layer 3 service disruption counts.
- The enhancement of MAP commands to exercise control for the new layer 3 service disruption log for each line.
- The introduction of a new office parameter to provision the value for the layer 3 service disruption threshold.
- The introduction of a new office parameter to provide office-based log control. A new field allows control of log generation for layer 3 ISDN logs on a BRI line equipment number (LEN) basis.
- The generation of reports includes logs for service disruption threshold and disruption counter capacity if the counter reaches its maximum capacity.
- The generation of a new audit that runs at 60-minute intervals. The audit resets the service disruption count and disables the threshold log throttle (if active) for ISDN lines.

Layer 3 Service Disruption modifies the display options for the following commands:

- L3LOGCTL
- QLAYER
- RLAYER

Note: For more information about the L3LOGCTL, QLAYER, and RLAYER commands, see “BRI Layer 2/3 Surveillance Monitoring."

L3LOGCTL

The L3LOGCTL command allows the user to control which ISDN layer 3 abnormality logs the system generates and which logs it prevents. The user can control the logs for each line or for the office. Use this command to set log generation parameters for each line. Set the office-wide parameters through table control.

Layer 3 Service Disruption (continued)

To generate a log for a selected line, set both the office parameter and the line parameter to ON. Use the selected line's override parameter to override this provision. The inclusion of this parameter allows the generation of log reports for each line instead of for the whole office. There are three options for this command: QUERY, SET, and SETOVR.

L3LOGCTL syntax

The command syntax for the L3LOGCTL command is

L3LOGCTL QUERY <query_type>

L3LOGCTL SET <l3logc_entity> <l3_entity_status>

L3LOGCTL SETOVR <l3_ovr_state>

This feature adds the L3SD selection to the l3logc_entity parameter of the L3LOGCTL SET command.

Table L3LOGCTL command parameters contain the definition for each of the parameter values.

L3LOGCTL command parameters (Sheet 1 of 2)

Parameter	Value	Description
QUERY	NA	Followed by the query_type variable, QUERY allows the user to view either the descriptions of the entities or the statuses of the entities.
query_type	DEF, STATUS	This required parameter follows the QUERY parameter. DEF allows the user to see the meanings of each entity. STATUS allows the user to see the status of each entity.
SET	NA	This option allows the user to set the status parameter of a log entity or log entities (using the all value) to ON or OFF.
l3logc_entity	ALL, Q931, ABN1-ABN13, PKT, ABN14-ABN21, L3SD	Enter a parameter after the L3LOGCTL SET command. The parameter values allow the user to turn ON or OFF each entity. This feature adds the parameter value L3SD which allows the user to turn ON or OFF the layer 3 service disruption log for each line.

L3LOGCTL command parameters (Sheet 2 of 2)

Parameter	Value	Description
l3_entity_status	ON, OFF	This parameter allows the user to indicate if the value of the previous l3logc_entity parameter is ON or OFF. This is a required parameter.
SETOVR	NA	This parameter allows the user to set the override parameter.
l3_ovr_state	ON, OFF	This parameter allows the user to indicate if the override byte is ON or OFF.

L3LOGCTL responses

The following examples are MAP displays affected by this feature when using the L3LOGCTL command.

The following figure shows the MAP response to the HELP L3LOGCTL command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display.

Layer 3 Service Disruption (continued)

MAP display of response to the HELP L3LOGCTL command

```
>HELP L3LOGCTL
L3LOGCTL - Used to set the layer 3 log control entities
for the ISDN line posted in the control position of the MAP.
Parms: [<com_type> {QUERY [<query_type> {DEF,
                                         STATUS}]},
                   {SET [<l3logc_entity> {ALL,
                                          Q931
                                          ABN1
                                          ABN2
                                          ABN3
                                          ABN4
                                          ABN5
                                          ABN6
                                          ABN7
                                          ABN8
                                          ABN9
                                          ABN10
                                          ABN11
                                          ABN12
                                          ABN13
                                          PKT
                                          ABN14
                                          ABN15
                                          ABN16
                                          ABN17
                                          ABN18
                                          ABN19
                                          ABN20
                                          ABN21
                                          L3SD
                                <l3_entity_status> {ON,
                                                    OFF}]},
                   {SETOVR [<l3_ovr_state> {ON,
                                            OFF}]}]
```

The following figure shows the MAP response to the L3LOGCTL QUERY DEF command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. This command displays the descriptions for layer 3 abnormality log entities.

Layer 3 Service Disruption (continued)

MAP display of response to the L3LOGCTL QUERY DEF command

```
>L3LOGCTL QUERY DEF

Layer 3 Abnormality Log Entity Definitions
Override: the override bit
Q931 : Q.931
abn1 : DISCONNECT received
abn2 : DISCONNECT transmitted
abn3 : RELEASE received
abn4 : RELEASE transmitted
abn5 : RELEASE COMP received
abn6 : RELEASE COMP transmitted
abn7 : Status message received
abn8 : Status message transmitted
abn9 : Progress message transmitted
abn10: msg rcvd less than minimum length
abn11: msg rcvd with invalid protocol discriminator info
abn12: msg rcvd with invalid call ref value
abn13: SETUP msg rcvd with cal ref flag incorrectly set to 1
PKT  : Packet
abn14: Restart request transmitted
abn15: Restart request received
abn16: Reset request transmitted
abn17: Reset request received
abn18: Clear request transmitted
abn19: Clear request received
abn20: Diagnostic packet transmitted
abn21: Diagnostic packet received
L3SD : Layer 3 Service Disruption
```

The following figure shows the MAP response to the L3LOGCTL QUERY STATUS command. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. This command displays the layer 3 abnormality log entity status.

Layer 3 Service Disruption (continued)

MAP display of response to the L3LOGCTL QUERY STATUS command

```
>L3LOGCTL QUERY STATUS

Loop Layer 3 abnormality log status:
Override: OFF
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7
OFF   ON    ON    ON    ON    OFF   ON    ON
ABN8  ABN9  ABN10  ABN11  ABN12  ABN13  PKT  ABN14
OFF   ON    ON     OFF    ON     OFF    ON   OFF
ABN15  ABN16  ABN17  ABN18  ABN19  ABN20 ABN21 L3SD
OFF    ON     ON     ON     ON     ON    OFF   ON
Office Layer 3 abnormality log status:
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7
OFF   ON    ON    ON    ON    OFF   ON    ON
ABN8  ABN9  ABN10  ABN11  ABN12  ABN13  PKT  ABN14
OFF   ON    ON     OFF    ON     OFF    ON   OFF
ABN15  ABN16  ABN17  ABN18  ABN19  ABN20 ABN21 L3SD
OFF    ON     ON     ON     ON     ON    OFF   ON
```

The following figure shows the MAP response to the L3LOGCTL SETOVR ON command. This command sets the override bit for the line. Before you enter this command, post an ISDN line at the LTPISDN level of the MAP display. The following example displays the L3SD field added by this feature.

MAP display of response to the L3LOGCTL SETOVR ON command

```
>L3LOGCTL SETOVR ON

Loop Layer 3 abnormality log status:
Override: ON
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7
OFF   ON    OFF   ON    ON    OFF   ON    ON
ABN8  ABN9  ABN10  ABN11  ABN12  ABN13  PKT  ABN14
OFF   ON    ON     OFF    ON     OFF    ON   OFF
ABN15  ABN16  ABN17  ABN18  ABN19  ABN20 ABN21 L3SD
OFF    ON     ON     ON     ON     ON    OFF   ON
Office Layer 3 abnormality log status:
Q931  ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7
OFF   ON    ON    ON    OFF   OFF   ON    ON
ABN8  ABN9  ABN10  ABN11  ABN12  ABN13  PKT  ABN14
OFF   ON    ON     OFF    ON     OFF    ON   OFF
ABN15  ABN16  ABN17  ABN18  ABN19  ABN20 ABN21 L3SD
OFF    ON     ON     ON     ON     ON    OFF   ON
```

Layer 3 Service Disruption (continued)

QLAYER

Use the QLAYER command to query the layer 1, 2, and 3 performance and abnormality information for ISDN lines. Execute this command from the LTPISDN level of the MAP. The command displays the information about the MAP. This feature modifies the information displayed for layer 3 to include the service disruption count for circuit services.

Note: This feature does not change the interface options for the QLAYER command.

The following example shows the MAP display generated by the full QLAYER command.

Layer 3 Service Disruption (continued)

MAP display of response to QLAYER command

```
>QLAYER

LEN HOST 01 0 00 06
Linecard:
 ---ES NE---  ---SES NE---    ---ES FE---  ---SES FE---
   C.Hr  C.Dy   C.Hr  C.Dy      C.Hr  C.Dy   C.Hr  C.Dy
     0     1      0     0         0     0      0     0
Active Thresholds (NE)   and   (FE)
    40   100     10    25        40   100     10    25

Linecard Clock    1   12:20:36

Frames received in total      :          0
Frames received in error      :          0
Frames transmitted in total   :        274
Frames retransmitted          :          0
Percentage error received     :       0.0%
Percentage retransmitted      :       0.0%

Number of Layer 2 Service Disruptions :     0
Length of Time Disrupted      :     0 minutes
Currently Disrupted           : NO

Layer 2 Individual Abnormality Counts:
ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9  ABN10
===== ===== ===== ===== ===== ===== ===== ===== ===== =====
   0     0     0     0     0     0     0     0     0     0

TEI Abnormality Count : 0
Layer 2 High Abnormality Count   : 0

Layer 3 High Abnormality Count   : 0
Layer 3 Service Disruption Count : 0
```

The following example shows the MAP display generated when the user enters the QLAYER L3 command.

Layer 3 Service Disruption (continued)

MAP display of response to QLAYER L3 command

```
> QLAYER L3

LEN HOST 01 0 00 06

Layer 3 High Abnormality Count   : 0
Layer 3 Service Disruption Count : 0
```

RLAYER

Use this command to reset and display the layer 1, 2, and 3 performance and abnormality information for ISDN lines. Execute this command from the LTPISDN level of the MAP. The command displays the information to the MAP. This feature modifies the information displayed for layer 3; it adds the service disruption count for circuit services.

The following table contains the descriptions of the RLAYER command parameters and variables.

RLAYER command parameters and variables

Parameter	Value	Description
layer	L1, L2, L3, full	L1 - displays performance information for layer 1 for the ISDN line. The mode parameter must follow this parameter. L2 - displays performance and abnormality information for layer 2 for the ISDN line. L3 - displays abnormality information for layer 3 for the ISDN line. full - displays abnormality information for all 3 layers. Full is the default option.
mode	CUR, HIST, BOTH	This parameter only applies when you specify layer 1: CUR - block error HIST - history BOTH - both CUR and HIST
all_posted	ALL	This optional parameter follows any of the previously listed parameters. It performs the selected RLAYER command on all lines in the posted set.

Layer 3 Service Disruption (continued)

The following figure shows the MAP display generated when you enter the RLAYER command. The default RLAYER command displays and resets all three layers unless you enter a distinct layer as part of the command entry.

Layer 3 Service Disruption (continued)

MAP display of response to the RLAYER command

```
>RLAYER

LEN HOST 01 0 00 06
Linecard:
 ---BE NE---  ---BE FE---
  C.Hr  P.Hr   C.Hr  P.Hr
     0     1      0     0
---ES NE---  ---SES NE---    ---ES FE---  ---SES FE---
   C.Hr  C.Dy   C.Hr  C.Dy      C.Hr  C.Dy   C.Hr  C.Dy
     0     1      0     0         0     0      0     0
  Active Thresholds (NE)   and   (FE)
    40   100     10    25        40   100     10    25
---ES NE---  ---SES NE---    ---ES FE---  ---SES FE---
   P.Hr  P.Dy   P.Hr  P.Dy  TI  P.Hr  P.Dy   P.Hr  P.Dy
      1            0        -1     0            0

Linecard Clock    1   12:20:36
Linecard COUNTERS : RESET
Frames received in total      :          0
Frames received in error      :          0
Frames transmitted in total   :        274
Frames retransmitted          :          0
Percentage error received     :       0.0%
Percentage retransmitted      :       0.0%

Number of Layer 2 Service Disruptions :     0
Length of Time Disrupted      :     0 minutes
Currently Disrupted           : NO

Layer 2 Individual Abnormality Counts:
ABN1  ABN2  ABN3  ABN4  ABN5  ABN6  ABN7  ABN8  ABN9  ABN10
===== ===== ===== ===== ===== ===== ===== ===== ===== =====
0     0     0     0     0     0     0     0     0     0

TEI Assignment Abnormality Count : 0
Layer 2 High Abnormality Count   : 0

L2 COUNTERS : RESET

Layer 3 High Abnormality Count   : 0
Layer 3 Service Disruptions Count: 0

L3 COUNTERS : RESET
```

The following example shows the MAP display generated when you enter the QLAYER L3 command.

Layer 3 Service Disruption (continued)

MAP display of response to RLAYER L3 command

```
> RLAYER L3

LEN HOST 01 0 00 06

Layer 3 High Abnormality Count    : 0
Layer 3 Service Disruptions Count : 0

   L3 COUNTERS :  RESET
```

Translations table o w

Layer 3 Service Disruption does not affect translations.

Limitations and restrictions

The limitations and restrictions that follow apply to Layer 3 Service Disruption:

- The layer 3 service disruption counter is a 16-bit integer; the maximum value for service disruption count is 65 535.
- After it reaches the maximum counter capacity, the CM generates the counter capacity log each time it detects an abnormality that disrupts layer 3 service.
- No provision exists to prevent the generation of the counter capacity log.
- This feature does not support reset of the layer 3 service disruption counter for separate ISDN lines. RLAYER L3 at the MAPCI LTPISDN level resets all layer 3 counters for that ISDN line.
- This feature does not support layer 3 service disruption reports for ISDN line drawer (ILD) lines.
- This feature does not support abnormality reports during emergency stand alone (ESA) for Remote Cluster Controller 2 (RCC2) peripherals.

Interactions

The paragraphs that follow describe how Layer 3 Service Disruption interacts with other functionalities.

CM

This feature uses the functionality introduced as part of BRI Layer 2/3 Surveillance Monitoring.

Layer 3 Service Disruption (continued)

XPM

Feature AF6669, ISDN BRI Layer 3 Abnormality Counts, performs this functionality for the line trunk controller (LTC) base XPM types. The software for feature AF6669 is in the XPM software loads. This functionality provides the CM the ability to collect layer 3 protocol abnormalities on a real-time basis. This feature requires feature AF6669 to provide the subset of layer 3 protocol abnormalities that explain layer 3 service disruption.

Activation and deactivation by the user

Layer 3 Service Disruption does not require activation or deactivation by the user.

Billing

Layer 3 Service Disruption does not generate billing records or changes.

Station Message Detail Recording

Layer 3 Service Disruption does not require Station Message Detail Recording.

Layer 3 Service Disruption (continued)

Of ce parameter s used by Layer 3 Service Disruption

The table that follows lists the office parameters used by Layer 3 Service Disruption. For additional information about office parameters, refer to the *Office Parameters Reference Manual*.

Of ce parameter s used by Layer 3 Service Disruption

Table name	Parameter name	Explanation and action
ISDNVAR	L3_SVC_DSRPT_THLD	This parameter sets the threshold value for the layer 3 service disruptions for circuit switched services. If the abnormalities that cause layer 3 service disruptions exceed this value, the ISDN subsystem can generate the layer 3 service disruption threshold log. But generation of the log only occurs when the log control is ON for both the office and the line. The range for this value is from 1 to 1000. The default value is 8.
ISDNVAR	L3_SVC_DSRPT_CTRL	This parameter controls generation of the layer 3 service disruption log for the office. The status of the layer 3 service disruption log for circuit switched services is either ON or OFF. To generate the layer 3 service disruption log reports office-wide, leave this parameter set to the default value of ON. If the override bit (in table L3ABNLOG for ISDN lines) is OFF, then the system generates the log for lines whose status is ON. To suppress the generation of layer 3 service disruption log reports office-wide, use table control to set this parameter to OFF.

Data ll sequence

The table that follows lists the tables that require datafill to put Layer 3 Service Disruption into operation. You must enter data into the tables in this order.

Data ll requirements f or Layer 3 Service Disruption

Table	Purpose of table
LNINV	Line Circuit Inventory Table lists the data for each line card slot for various peripheral module types.
L3ABNLOG	Layer 3 Abnormality Log Control contains the reporting status for layer 3 log reports for each ISDN line.

Data ll related to La yer 3 Service Disruption for table L3ABNLOG

The table that follows provides the datafill related to Layer 3 Service Disruption for table L3ABNLOG. This table includes only those fields that apply directly to Layer 3 Service Disruption.

Data ll related to tab le L3ABNLOG

Field	Subfield	Entry	Explanation and action
L3SD		ON or OFF	Layer 3 service disruption. Report generation status for layer 3 service disruption log reports. Enter ON, the default value, to turn on L3SD log reports for separate lines. Enter OFF to turn off L3SD log reports for separate lines.

Data ll e xample for table L3ABNLOG

The figure that follows shows sample datafill for table L3ABNLOG.

MAP example for table L3ABNLOG

```
LEN         OVR  Q931 ABN1 ABN2 ABN3 ABN4 ABN5 ABN6 ABN7
_____________________________________________________
02 1 4 02   OFF  ON   ON   ON   OFF  ON   ON   ON   ON

ABN8 ABN9 ABN10 ABN11 ABN12 ABN13 ABN14 ABN15 ABN16 ABN17
_____________________________________________________
ON   OFF  OFF   ON    ON    ON    ON    ON    ON    ON

ABN18 ABN19 ABN20 ABN21 PKT  L3SD
_____________________________
ON    ON    ON    ON    OFF  ON
```

Translation veri cation tools

Layer 3 Service Disruption does not use translation verification tools.

SERVORD

Layer 3 Service Disruption does not use the Service Order System (SERVORD).

MADN CACH for ACB/AR Interworking

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA011 and up

MADN CACH for ACB/AR Interworking was introduced in NA011.

Prerequisites

MADN CACH for ACB/AR Interworking has no prerequisites.

Description

MADN CACH for ACB/AR Interworking extends the Automatic Call Back (ACB) and Automatic Recall (AR) features to National ISDN 2 (NI-2) fully initializing terminals within a Multiple Appearance Directory Number (MADN) Call Appearance Call Handling (CACH) group. This feature allows members of Electronic Key Telephone Service (EKTS) MADN CACH groups to use ACB and AR.

The MADN CACH feature provides for up to 16 call appearances (CA) for each MADN CACH DN. Each CA can have up to 32 members. Each separate member is a terminal call appearance (TCA).

MADN CACH for ACB/AR Interworking makes several changes necessary to allow operating companies to provision ACB, AR, or both options on a MADN CACH DN. No longer does the ISDN subsystem block the following Service Order System (SERVORD) procedures:

- ACB/AR added to a MADN CACH primary DN
- MADN CACH added to a DN that has the ACB/AR feature
- AR activated from a secondary MADN single call arrangement (SCA) or CACH member

The ISDN ACB feature enables a subscriber to place a call to the last station called by the subscriber. With ISDN ACB, the last station called by the subscriber can be busy or idle. The ISDN AR feature enables a subscriber to place a call to the last station that called the subscriber. With ISDN AR, the last call received by the subscriber can be answered or unanswered. The last station that called the subscriber can be busy or idle. MADN CACH for ACB/AR Interworking provides AR functionality for both primary and

secondary SCA and CACH members. For secondary members to use AR, a primary member with AR must exist within the same CA.

Operation

The subscriber completes the ISDN ACB or AR activation procedure. Then the ISDN subsystem checks the busy or idle status and the class of service of the destination line. If the terminating line is idle and the class of service permits, the switch tries to set up the call. If the switch cannot complete the call immediately because of a busy line, then the switch queues the call. The switch tries the call again when both stations are idle. As part of the call completion, the switch gives the calling station special ringing. When the subscriber answers, the switch sets up the call and gives the called station normal ringing.

Comparison and contrast of ISDN ACB and AR

The difference between AR and ACB is that activation of the AR feature by a terminal is against call terminations and not against call originations. This difference indicates that the switch uses the Incoming Call Memory (ICM) to store information for the AR feature about the last incoming call. The ICM stores information for each TCA.

This feature does not change user activation and deactivation of ISDN ACB/AR. The AR feature is only available through an activation code. To activate ACB, the user can either

- use a feature activation code to start ACB as part of a call setup on the call origination, after receiving busy on the previous call
- use the ACB feature toggle key within the context of a call to activate or deactivate ACB

The operation of the ISDN ACB toggle key closely resembles the existing ACB key feature for Meridian business sets (MBS). When the user presses the TCA key followed by the ACB toggle key, the system activates ISDN ACB and illuminates the ACB lamp. If the user presses the ACB toggle key while ISDN ACB requests remain, the ISDN subsystem deactivates all the requests.

When a terminal starts an AR request on a selected CA key, the switch tries to originate a call to the calling party number that made the last incoming call. If the calling party is busy, the switch cannot complete the call. When both the calling and called parties are free, the switch sends a recall notify to the calling party. When the calling party answers, the switch establishes a call between the calling and called parties.

MADN CACH for ACB/AR Interworking (continued)

In addition to one-level activation, the user can activate ISDN AR with a two-level procedure. Two-level activation does not apply to ISDN ACB.

The system checks the line that requests access to ISDN AR to determine if the line has access. If the line does not have access, the ISDN terminal receives a denial announcement and displays “Request denied". The line is idled without delay upon completion of the denial announcement. If access is allowed, an announcement informs the user that ISDN AR has been accessed. If the number in the ICM is valid, the DN of the last incoming call is announced to the user. With two-level activation, the date and time of the last incoming call can also be provided. Voiceback includes the date, the time, and the calling DN. If the DN in the ICM is designated as private, a private number indication is announced to the subscriber.

In either event, the message instructs the user to dial 1 to activate ISDN AR or to hang up to abort the ISDN AR request. If the number in the ICM is invalid (an out-of-area or DN not available indicator or only a partial DN exists in the calling number section), the message informs the user that the switch cannot activate ISDN AR for the most recent incoming call. After this announcement, the switch idles the line immediately. If the number is valid and the subscriber dials 1 to activate the feature, the two-level activation procedure is complete. The system then tries to call the DN associated with the most recent incoming call.

The switch uses automatic call establishment to complete the call. Automatic call establishment operates only after the switch receives a notify message during Recall Notify. AR activation can only be queued against one TCA at a time.

Before this feature, SERVORD blocked the AR feature on secondary MADN SCA and CACH members. Now MADN SCA and CACH secondary members can use the AR feature if the primary member of the group has AR. The operating company can remove AR from the primary member. Removal of AR from the primary member removes access to AR for all secondary members.

If you remove or change the primary member with AR, the secondary MADN group members cannot use the AR feature. To assign AR to a MADN CACH group, first assign AR to the primary member of that group.

ACB operation

When the user activates ACB on a MADN CACH CA, the system calls back the last number called from that TCA. A normal call has two parties: the calling party (member of the MADN CACH group) and the called party.

MADN CACH for ACB/AR Interworking (continued)

Figure 1 describes ACB operation with MADN CACH for ACB/AR Interworking.

The calling party (Terminal A) goes off-hook on ISDN terminal CA key 1 and places a call to the called party (Terminal B). The calling party (Terminal A) receives a busy signal that indicates that the called party (Terminal B) is already off-hook. The calling party (Terminal A) releases and goes off-hook at another time. When the user presses the ACB activation code for CA key 1, the calling party (Terminal A) automatically calls back the called party (Terminal B).

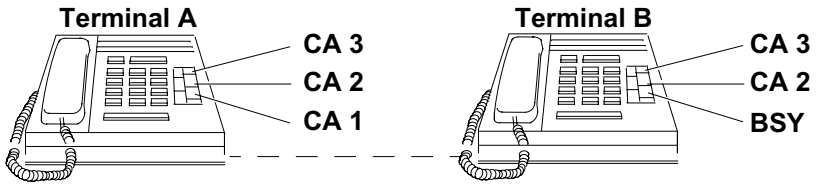
The operating company can provision ACB on a MADN CACH DN or on a terminal with MADN CACH assigned. MADN CACH for ACB/AR Interworking allows ACB activation for one TCA or for every CA key on the terminal (1st figure).

When a call originates from a MADN CACH DN with ACB, the ISDN subsystem updates the Outgoing Call Memory (OCM) for the TCA. When the user later activates ACB on a TCA, the system establishes a call with the last DN called from that TCA. If a different DN is called from another MADN CACH CA on the same terminal, the system calls back the key for that TCA on activation of ACB on that key. The system does not update the previous TCA's OCM with the most recent outgoing call.

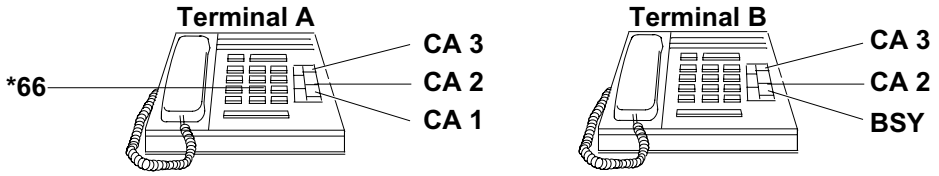
MADN CACH for ACB/AR Interworking (continued)

Typical call sequence for ACB

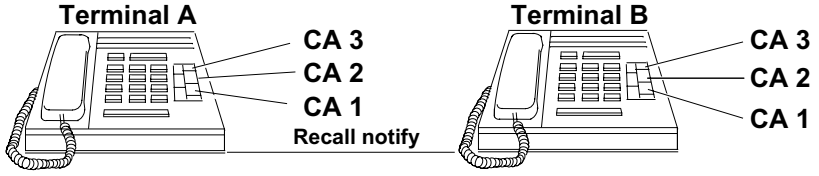
A calls B, B is busy



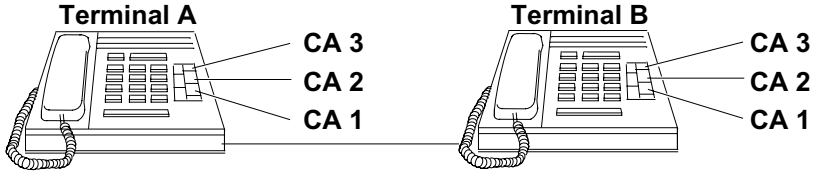
A releases, enters feature activation code for ACB



B idles, sends Recall Notify to A

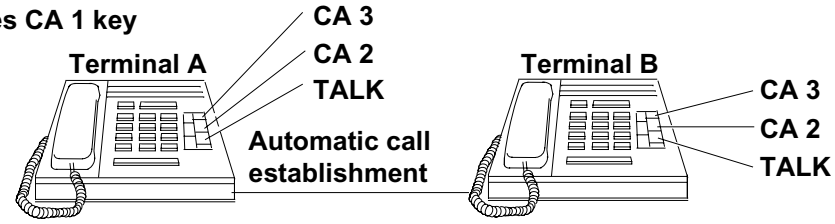


A presses CA 1 key



Automatic call establishment occurs

A presses CA 1 key



MADN CACH for ACB/AR Interworking (continued)

AR operation

When the user activates AR on a MADN CACH TCA, the system originates a call to the last number that called the TCA. For example, a normal call can have four parties: the Calling Party (Party 1), Party 2, Party 3, and Party 4. Party 1 is a member of MADN CACH group CA 1 (see 2nd figure).

Party 1 receives a call from Party 2 on the primary key CA1, which has AR provisioned. The two parties communicate and release. Party 1 goes off-hook on CA 1 to place a call to Party 3. At the same time, Party 2 is communicating with Party 4. Party 1 releases the call on CA 1 with Party 3 and activates AR against Party 2 through a feature activation code. Party 1 receives a busy signal and releases.

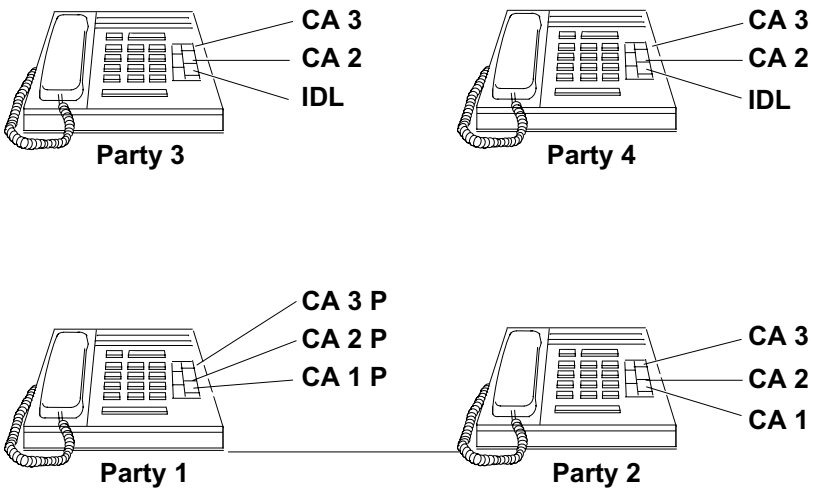
Party 1 receives a notification that Party 2 is idle. When Party 1 presses the CA1 key, the next call is to Party 2 because no other call came into Party 1. However, if Party 1 had received another call from another party (Party 3 or 4), then the primary key (CA 1) would recall that other party.

The operating company can provision AR on a MADN CACH DN or on a terminal with MADN CACH assigned. MADN CACH for ACB/AR Interworking allows AR activation for one TCA or for every CA key on the terminal.

MADN CACH for ACB/AR Interworking (continued)

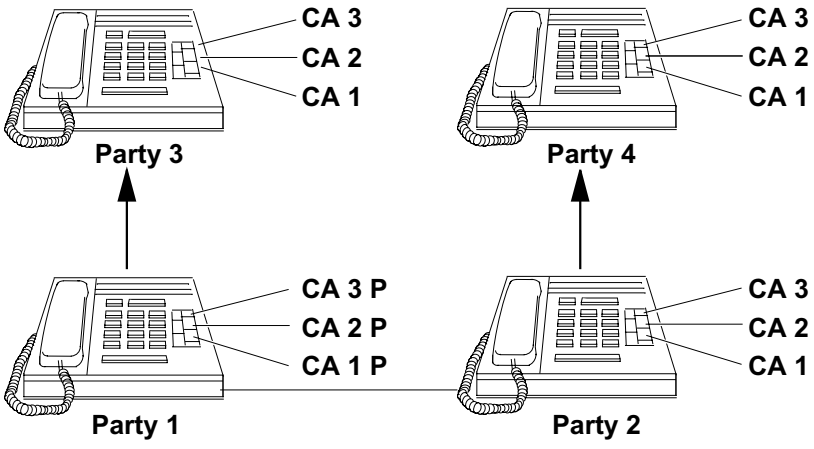
Typical call scenario for AR

Party 2 calls Party 1



Party 1 calls Party 3

Party 2 calls Party 4



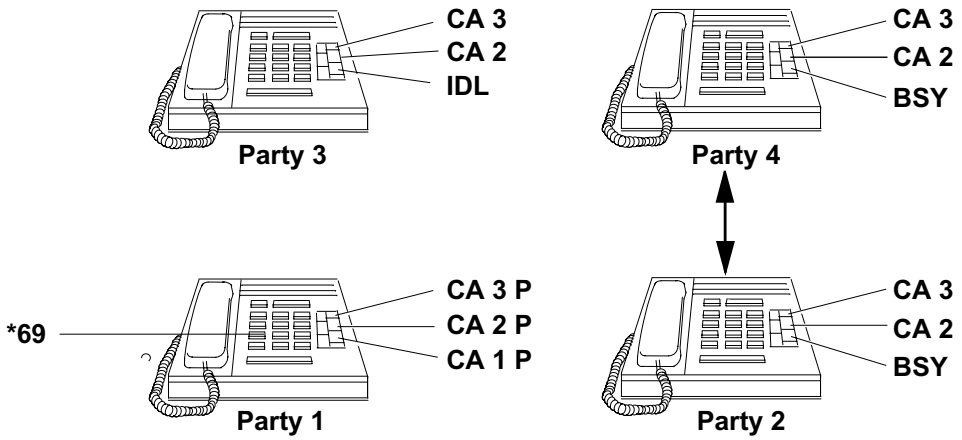
***Note*: P = Primary member**

MADN CACH for ACB/AR Interworking (continued)

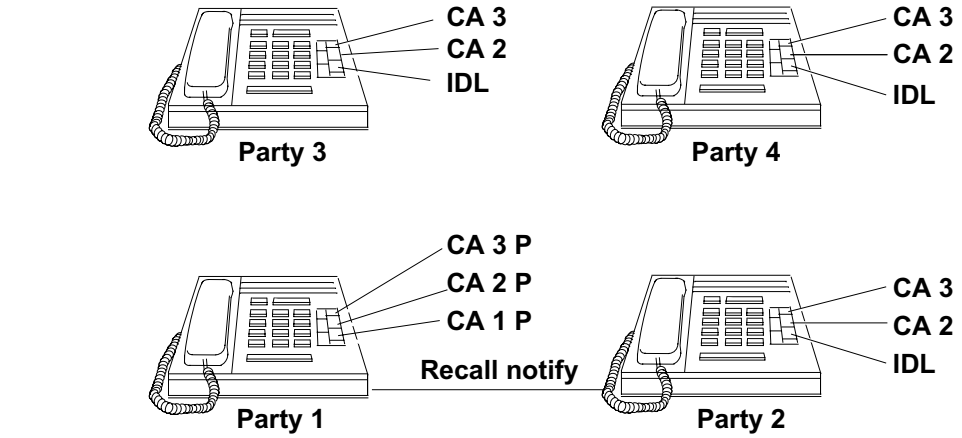
Typical call scenario for AR (continued)

Party 1 releases Party 3
Party 1 activates feature activation code for AR

Party 2 is busy, Party 1 releases



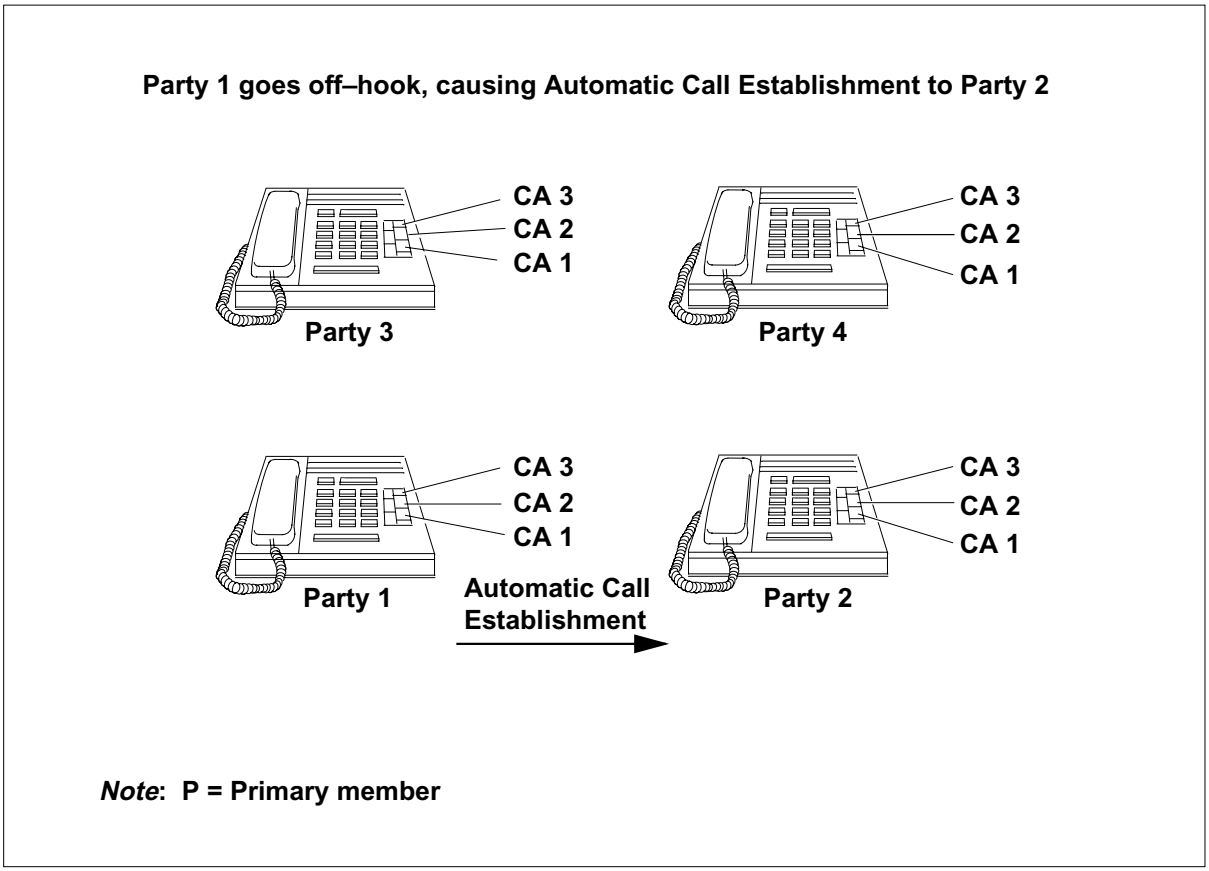
Party 2 releases, sending Recall Notify to Party 1



***Note*: P = Primary member**

MADN CACH for ACB/AR Interworking (continued)

Typical call scenario for AR (continued)



When a call terminates to a MADN CACH DN provisioned with AR, the system updates the ICM for the primary member of that TCA. When the user later activates AR on that TCA, the system establishes a call with the last DN calling the TCA for which AR is active. If a different DN calls another MADN CACH TCA on the same terminal, the key for that TCA is recalled on activation of AR on that key. The switch does not update the previous TCA's ICM with the latest incoming call information.

The NA100 product allows interworking between the MADN SCA service and ACB/AR, for both origination and termination. If a primary MADN SCA member has AR provisioned, the secondary MADN SCA member assigned AR can use the ICM referred by the primary member. The primary MADN SCA member must have AR provisioned to provide allocation of ICM for the MADN SCA group. The secondary member determines the calling DN stored in the primary member's ICM.

MADN CACH for ACB/AR Interworking (continued)

When the ISDN ACB or AR service is active, originating or terminating scanning continues until

- one of the timers expires
- the switch finds the called party idle
- the originator manually deactivates the ACB/AR request

This feature provides ACB/AR notification to the requesting terminal only when all of the following are true:

- The monitored party is idle.
- The calling TCA that requested ACB/AR is idle on the ACB/AR terminal.
- The ACB/AR service is still active and has not been cancelled by the end user or by expiration of a timer.

ACB/AR recall notification sends a notify message to the terminal to alert the user that the called CA key is idle. Now the user can place the call automatically by going off-hook on the key indicated in the notify message. When the user presses the MADN CACH DN key that has the notify message, the switch establishes the call automatically. If the user presses another CA key for the MADN CACH DN, the user gets dial tone and can make a call to any DN.

MADN CACH for ACB/AR Interworking notifies only the key that activates AR or ACB. This feature sends the notify message to the TCA that actually started the ACB or AR feature. The notify message includes the Call Appearance Identifier (CAPI) of the TCA that started the feature.

Translations table o w

MADN CACH for ACB/AR Interworking does not affect translations table flow.

Limitations and restrictions

The following limitations and restrictions apply to MADN CACH for ACB/AR Interworking:

- Only NI-2 terminals support ISDN ACB and AR.
- For this feature, the switch activates the ACB request against the TCA that makes the request. The Call Appearance Identifier (CAPI) in the Notify message must be the CAPI that made the ACB request. The ACB request is not made against the DN or terminal from which the request originated.

MADN CACH for ACB/AR Interworking (continued)

- This feature is not compatible with the Call Appearance Reservation Services (CARES) feature. In MADN CACH for ACB/AR Interworking, no CA searching is done because the feature is TCA based.
- This feature uses the TCA to originate the call and can start the AR request from that CA key only.
- This feature does not require secondary MADN members to have AR provisioned if the primary member already has AR.
- Assign AR to primary members on key 1 only.
- Do not remove the primary member with AR provisioned if secondary MADN SCA or CACH members want to use the AR feature.

Interactions

The following paragraphs describe the interactions between MADN CACH for ACB/AR Interworking and other functionalities.

This feature does not modify the current CACH functionality. That is, this feature allows users to perform functions such as BRIDGE, HOLD, and RETRIEVE after they start a call that uses ACB or AR.

This feature supports EKTS MADN Bridging interaction regardless of the size of the conference facilities used. Members of a MADN CACH group can have different sized conference services, and continue to interwork with ACB/AR, as they did before this feature. The requirements for bridging are the same if a MADN SCA or MADN CACH shares the CA.

Activation/deactivation by the end user

MADN CACH for ACB/AR Interworking requires no activation or deactivation by the end user.

Billing

If you set the SUSP (subscription usage sensitive pricing) option to ON in table AMAOPTS, the AMA billing option is available for the CLASS SUSP features ACB and AR. Set the AMA billing option during the addition of options ACB or AR to a subscriber line. Use the Service Order System (SERVORD) to set these billing options.

Station Message Detail Recording

MADN CACH for ACB/AR Interworking does not affect Station Message Detail Recording.

MADN CACH for ACB/AR Interworking (continued)

Data lling of ce parameter s

MADN CACH for ACB/AR Interworking does not affect office parameters.

Data ll sequence

MADN CACH for ACB/AR Interworking does not affect datafill sequence.

Translation veri cation tools

MADN CACH for ACB/AR Interworking does not use translation verification tools.

SERVORD

Assign the MADN/EKTS CACH feature and the ACB and AR options to subscriber lines through SERVORD. MADN CACH for ACB/AR Interworking removes SERVORD blocking that previously prevented addition of options ACB and AR for MADN CACH DNs. This feature removes provisioning blocking that prevented the addition of MADN CACH to DNs already assigned options ACB or AR. This feature also removes provisioning blocking that prevented the addition of option AR for MADN SCA DNs.

Use the SERVORD command NEW (establish service) to create a new MADN/EKTS CACH group. You can assign an existing MADN SCA or CACH member to either a new or existing CA. Assign the MADN SCA or CACH member as either a primary or secondary member. MADN CACH for ACB/AR Interworking allows the user to create a MADN CACH DN (primary or secondary) provisioned with ACB, AR, or both.

Use the SERVORD command ADO (add option) to assign the MADN option with a MADN call type of CACH to an existing non-MADN DN. This feature allows the user to

- add ACB/AR to a MADN CACH DN
- add MADN CACH to a DN already assigned ACB/AR
- add AR to a secondary MADN SCA or CACH member

Use the SERVORD command CHF (change feature) to change the line option for a MADN SCA or CACH DN. You can change the keylist of a MADN SCA or MADN CACH DN that has option ACB, option AR, or both options.

Use the SERVORD command DEO (delete option) to delete the MADN SCA or CACH option from a MADN SCA or CACH DN (primary or secondary member). MADN CACH for ACB/AR Interworking allows the user to delete AR and ACB from primary SCA or CACH members. Secondary MADN SCA

MADN CACH for ACB/AR Interworking (continued)

or CACH members cannot use the ACB or AR features if you delete AR or ACB from the primary member.

Use the SERVORD command OUT (remove service) to unprovision a MADN SCA or CACH member. Use the OUT command to remove either the primary or secondary members of a MADN SCA or CACH group.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to MADN CACH for ACB/AR Interworking:

- Assign option AR to primary MADN members if you require that secondary MADN members can use the AR feature.
- The operating company can delete AR from a primary CACH member. Deletion of option AR removes AR functionality for all MADN/EKTS CACH secondary members.

SERVORD prompts

The following table shows the SERVORD prompts used to assign ACB/AR to a MADN CACH primary or secondary member.

SERVORD prompts for MADN CACH for ACB/AR Interworking (Sheet 1 of 2)

Prompt	Valid input	Explanation
BILLING_OPTION	AMA or NOAMA	Indicates billing option to be specified, if required, when assigning the option.
DN	Ten digits entered with no spaces or hyphens.	Directory number.
DN_OR_LEN	Refer to DN and LTID in this table for information on valid inputs.	Enter the line's DN or LTID. For a MADN line or MLH/DLH members, if a DN is specified, the user is prompted for the LTID. If the LTID is entered, the user is not prompted for the DN.
KEYLIST	1 to 69	The list of keys available on the terminal. Up to 24 keys can be specified.
LTID	An LTID consists of a logical terminal group name (LTGRP) of 1 to 8 alphanumeric characters, a space, and a terminal number (1 to 1022).	The logical terminal identifier.

MADN CACH for ACB/AR Interworking (continued)

SERVORD prompts for MADN CACH for ACB/AR Interworking (Sheet 2 of 2)

Prompt	Valid input	Explanation
OPTION	ACB or AR	Assigns, updates, or removes options ACB or AR.
OPTKEY	1	Key associated with the option.

SERVORD example for adding ACB to a MADN CACH DN

The following SERVORD example shows how ACB is added to a MADN CACH primary member using the ADO command.

SERVORD example for MADN CACH for ACB/AR Interworking in prompt mode

```
> ado $
DN_OR_LEN:
> ni2 380
OPTKEY:
> 1
OPTION:
> acb
BILLING_OPTION: NOAMA
> ama
KEYLIST:
> 1
KEYLIST:
> $
OPTKEY:
> $
```

SERVORD example for MADN CACH for ACB/AR Interworking in no-prompt mode

```
> ado $ ni2 380 1 acb ama 1 $ $
```

SERVORD example for adding AR to a MADN CACH DN

The following SERVORD example shows how AR is added to a MADN CACH secondary member using the ADO command.

MADN CACH for ACB/AR Interworking (continued)

SERVORD example for MADN CACH for ACB/AR Interworking in prompt mode

```
> ado $
DN_OR_LEN:
> ni2 381
OPTKEY:
> 1
OPTION:
> ar
BILLING_OPTION: AMA
>
KEYLIST:
> 1
KEYLIST:
> 2
KEYLIST:
> $
OPTKEY:
> $
```

SERVORD example for MADN CACH for ACB/AR Interworking in no-prompt mode

```
> ado $ ni2 381 1 ar 1 2 $ $
```

SERVORD example for adding MADN CACH to a DN provisioned with ACB/AR

The following SERVORD example shows how MADN CACH is added to a DN (already assigned option AR) using the ADO command.

MADN CACH for ACB/AR Interworking (end)

SERVORD example for MADN CACH for ACB/AR Interworking in prompt mode

```
> ado $
DN_OR_LEN:
> ni2 99
OPTKEY:
> 1
OPTION:
> mdn cach y y
CARES_TYPE:   NULL
>
DIR_NUMBER:    6137239999
>
DENIAL_TRMT:
> silence
BRIDGING:
> y
CONF_SIZE:
> 3
BRIDGE_TONE:
> y
INIT_STAT:
> nonprivate
OPTKEY:
$
```

SERVORD example for MADN CACH for ACB/AR Interworking in no-prompt mode

```
> ado $ ni2 99 1 mdn cach y y silence y 3 y nonprivate $
```

MADN/Flexible Calling Interworking for ISDN

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA011 and up

Prerequisites

Complete use of this functionality can require software or hardware not described in this document.

Description

MADN/Flexible Calling Interworking for ISDN provides enhancements for the ISDN basic rate interface (BRI) DMS-100 product. This feature provides interworking between

- Electronic Key Telephone Service (EKTS) Multiple Appearance Directory Number (MADN) bridging
- Flexible Calling (FC) conferencing

MADN/Flexible Calling Interworking for ISDN removes call processing block restrictions which allows a MADN group member to

- MADN bridge into an established FC conference
- invoke FC conferencing while MADN bridged

Note: The size of the FC conference is based on the ISDN FC (or other conference calling) subscription of the end user.

Operation

Because this feature provides changes in call processing only, this section provides brief descriptions of EKTS MADN and FC. To provision EKTS MADN and FC features, refer to the following information in the ISDN translations section of this document:

- “Electronic Key Telephone Service" and “MADN/EKTS Call Appearance Call Handling (CACH)"
- “Flexible Calling (pre-NI-2)" and “Flexible Calling (NI-2)"

MADN/Flexible Calling Interworking for ISDN (continued)

There are figures in this section to help explain MADN bridging, FC conferencing, and the interwork between MADN and FC. In those figures the following conventions apply:

- Caller A is the primary member of the MADN group. Caller A establishes the FC conference and acts as the FC controller. An FC controller can add members to or drop members from the FC conference.
- Caller B is a secondary member of the MADN group. Caller B requests to MADN bridge into the FC call.
- Parties X, Z, and AA are external parties to the MADN group. These parties are the conferees for FC conference calls.
- Parties Y and BB are also external parties to the MADN group. These parties are add-on members for FC conference calls.

Note: An agent provisioned with the EKTS MADN DN can MADN bridge into the call while an MADN member has FC active.

EKTS MADN description

The primary group of EKTS services is the set of MADN features. MADN is a shared-DN service where call appearances of a single DN can appear on a number of terminals. The set of call appearances is a MADN group, and each individual call appearance is a MADN group member. A group can have up to 32 members. Each group has a primary member. All other members are secondary members.

The DMS-100 switch provides several types of MADN arrangements. The EKTS environment uses the following MADN types: Single Call Arrangement (SCA) and Call Appearance Call Handling (CACH). SCA means that only one call can be active per group. The CACH type provides for up to 16 call appearances (groups) for each MADN CACH directory number (DN). Because a group can have up to 32 members, the CACH type increases the maximum number of possible appearance for each DN to 512 (16 call apperances x 32 members). In this feature, references to EKTS MADN or MADN refer to both MADN types: SCA and CACH.

To create a MADN group, assign option EKTS and MADN features to all the terminals in the group. You provision EKTS and MADN features through the Service Order System (SERVORD). Refer to “Electronic Key Telephone Services" and “MADN/EKTS Call Appearance Call Handling (CACH)" in the ISDN translations section of this document for detailed information.

EKTS MADN bridging

When a member of a MADN group originates a call, the MADN feature updates the state of the group. This update correctly sets the lamps on all

MADN/Flexible Calling Interworking for ISDN (continued)

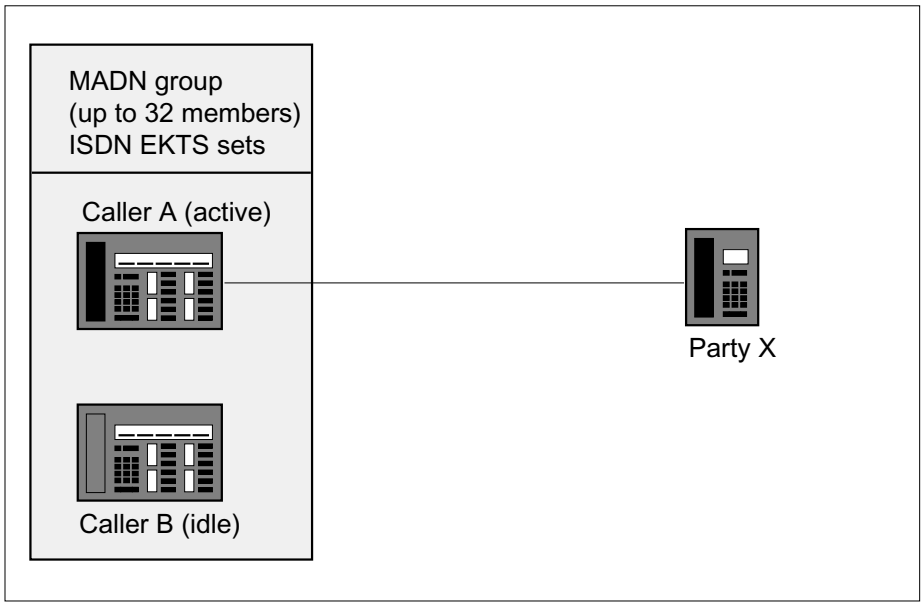
MADN sets in the group. If the MADN group state is busy and privacy is not active, a secondary member can MADN bridge the call. When a secondary member tries to bridge the call, EKTS MADN bridging allocates an MADN conference.

EKTS MADN bridging validates the bridge request, allocates the conference circuit, and configures the MADN-bridged members on the conference circuit.

MADN/Flexible Calling Interworking for ISDN (continued)

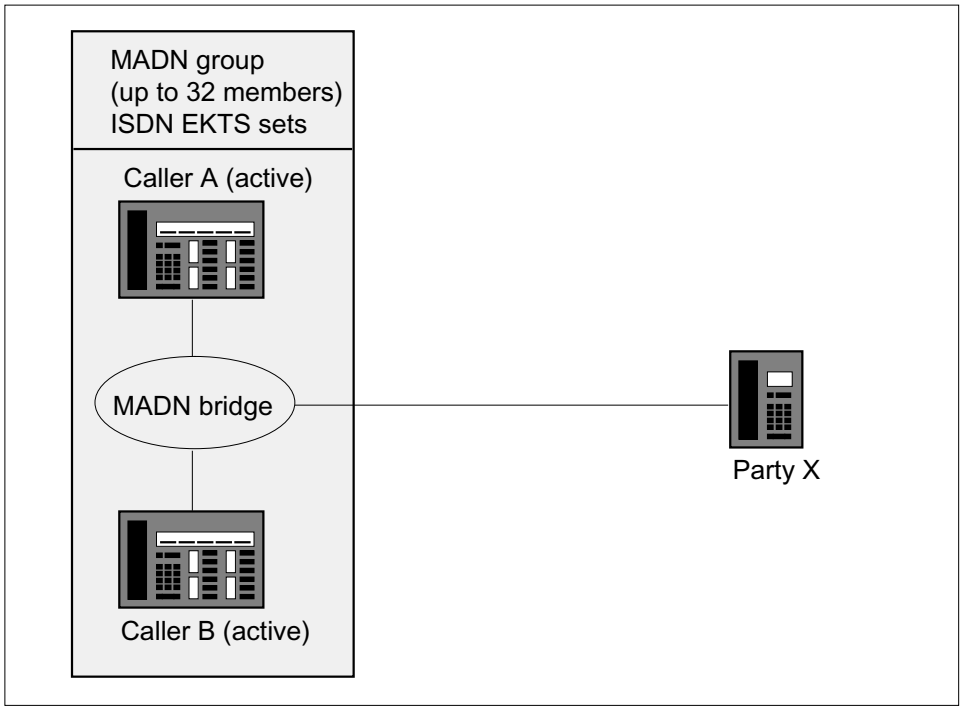
The following example shows EKTS MADN bridging:

1. Caller A is the primary member of a MADN group. Caller B is a secondary member of the MADN group. Caller A creates a two-party call with party X.



2. Caller B, a secondary member of the MADN group, goes off-hook. Caller B MADN bridges into the call. Caller A and B communicate with Party X.

MADN/Flexible Calling Interworking for ISDN (continued)



FC description

FC allows an end user to establish two or more concurrent calls and join them into a conference call. FC allows the end user to

- change an established call to a conference call
- hold and retrieve a conference call
- bridge either an incoming or outgoing basic call into a conference call
- release, or drop, the last member to join the conference call
- transfer a conference call

FC parameters and related options are

- flexible calling (FC), which assigns FC to one or two feature keys on the terminal
- conference size (CONFSIZE), which determines the number of members allowed on an FC conference call. The conference size is from 3 to 30 members.
- transfer (XFER in pre-NI-2 FC, TRANSFER in NI-2 FC), which identifies the conference calls and non-conference calls that can be transferred and defines transfer conditions. The use of XFER or TRANSFER depends on the subscriber terminal type. Provision XFER on pre-NI-2 terminals;

provision TRANSFER on NI-2 terminals. (XFER and TRANSFER cannot exist on the same terminal.)

- drop (DROP), which allows the conference controller (that is, the initiator of the conference) to drop the last user from the conference

Use SERVORD to provision the FC parameters to the terminal. Table KSETFEAT stores the datafill for these parameters. Refer to “Flexible Calling (pre-NI-2)" and “Flexible Calling (NI-2)" in the ISDN translations section of this document for detailed information.

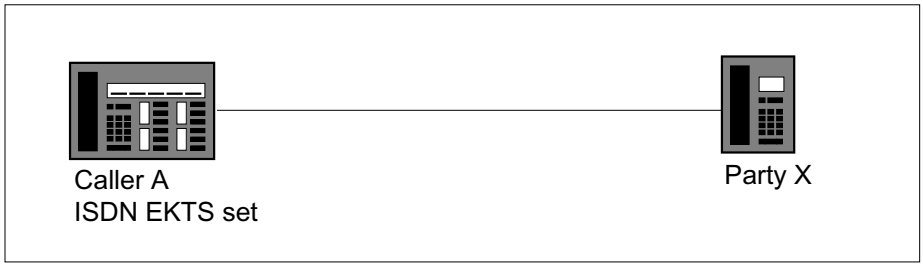
FC conferencing

This section provides an example of FC to explain its application within MADN/Flexible Calling Interworking for ISDN. FC creates a topology like

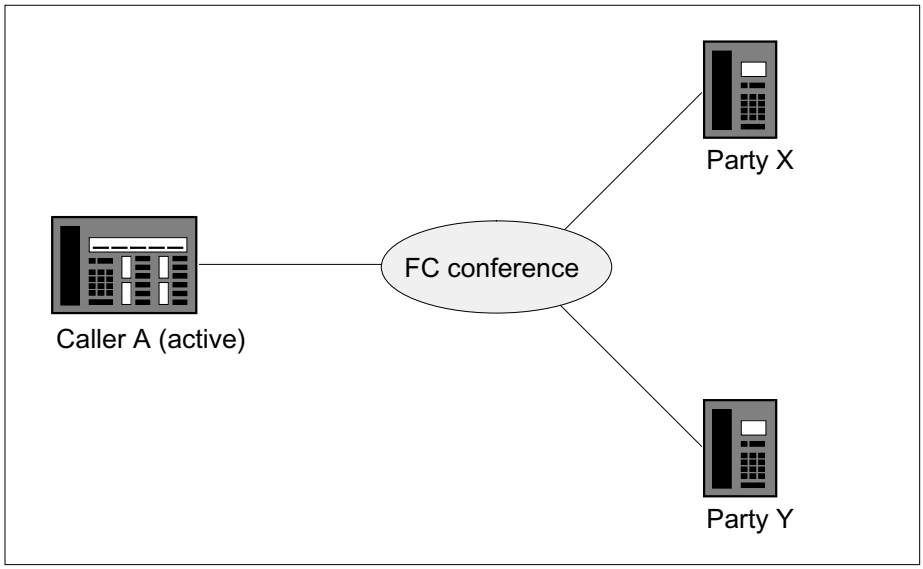
MADN/Flexible Calling Interworking for ISDN (continued)

that of EKTS MADN bridging. The following example shows FC conferencing:

1. Caller A creates a two-party call with party X. Caller A uses an ISDN EKTS set.



2. Caller A invokes FC (caller A holds the call to party X and calls party Y). Caller A creates an FC conference with parties X and Y.



EKTS MADN and FC interworking

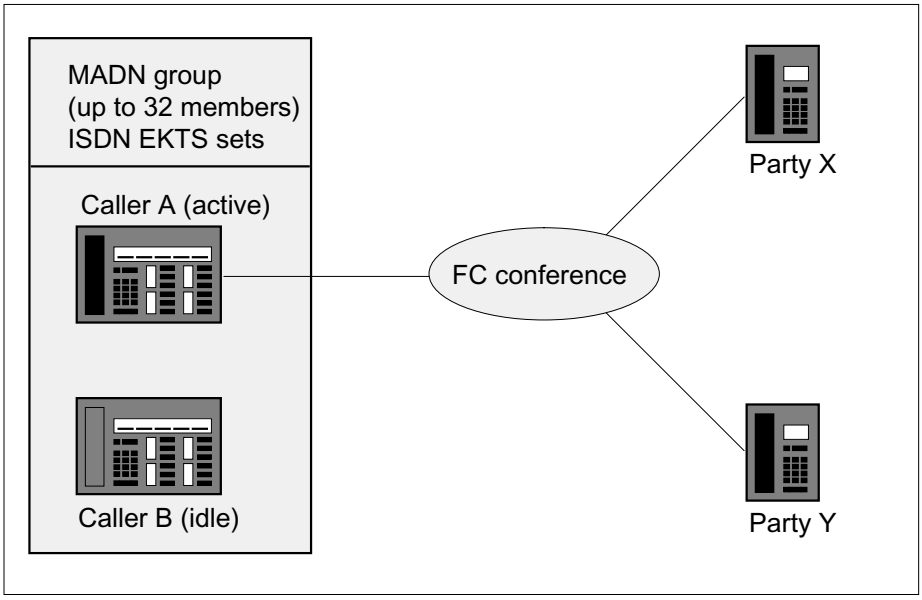
This feature joins the functionality of EKTS MADN bridging and FC conferencing. The next four examples show different scenarios of interworking between EKTS MADN bridging and FC conferencing.

MADN/Flexible Calling Interworking for ISDN (continued)

Example 1-FC conferencing, followed by MADN bridging

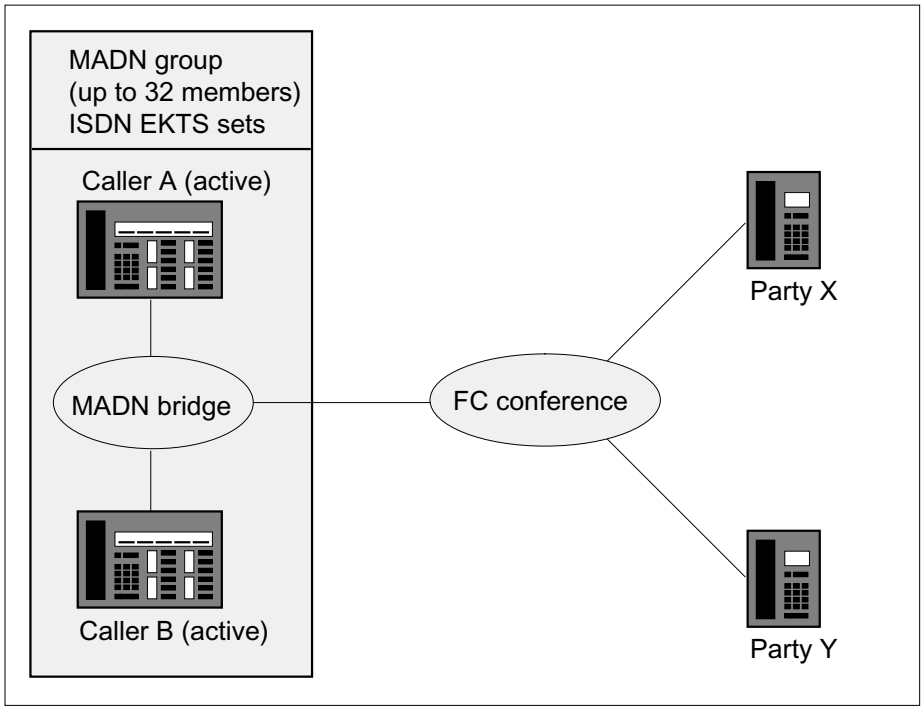
This example shows EKTS MADN bridging into an FC conference:

1. Caller A is the primary member of a MADN group and has the FC feature. Caller B, a secondary member of the MADN group, is idle. Caller A creates an FC conference with parties X and Y.



2. Caller B presses the MADN DN key to MADN bridge into the FC conference created by caller A. Caller B MADN bridges into the FC conference.

MADN/Flexible Calling Interworking for ISDN (continued)



Note 1: Caller A (FC controller) cannot invoke FC transfer if one or more MADN group members are part of the MADN bridge.

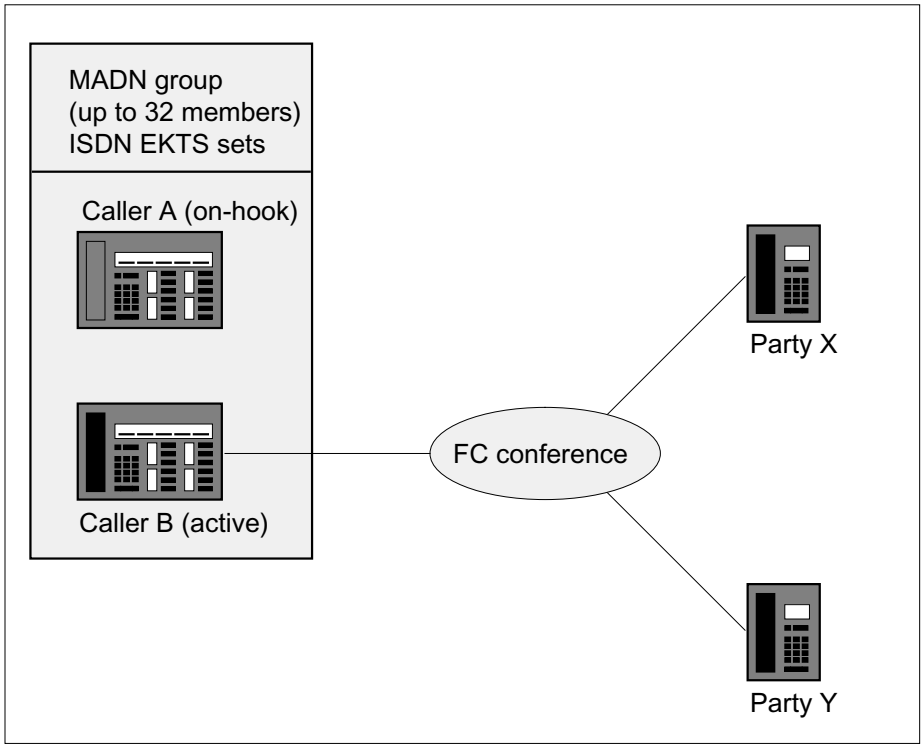
Note 2: If caller A (FC controller) releases from the MADN bridge, the MADN bridge collapses. Caller B remains in an FC conference with parties X and Y. Caller A continues to be the FC controller.

Note 3: If caller B releases the MADN call, the MADN call clears. If caller A has implicit transfer, parties X and Y reconfigure to a two-party call. If caller A has explicit transfer, the call clears.

Note 4: If party X (conferee) drops the call, the FC conference collapses. Callers A and B MADN bridge with party Y. If caller A has

the Disconnect Conference Circuit (DDC) option provisioned, the FC conference circuits release.

3. Caller A goes on-hook from the MADN call, and the FC conference remains active with caller B as a participant.



Note 1: Although caller A goes on-hook from the MADN call, caller A continues to be the FC controller. FC controller status does not transfer to caller B.

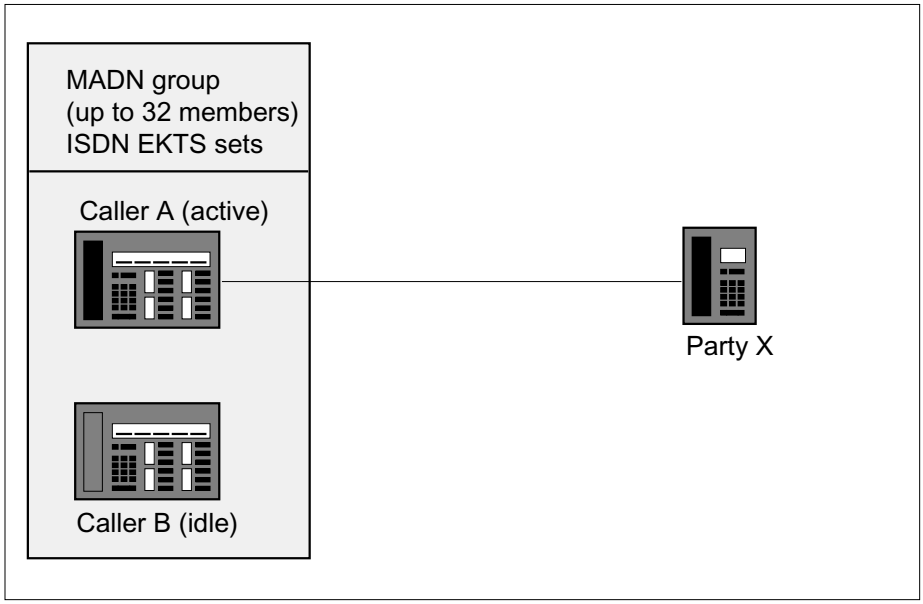
Note 2: If party X (conferee) drops the call, the FC conference ends. Caller B and party Y reconfigure to a two-party call. Caller A continues to be the FC controller.

MADN/Flexible Calling Interworking for ISDN (continued)

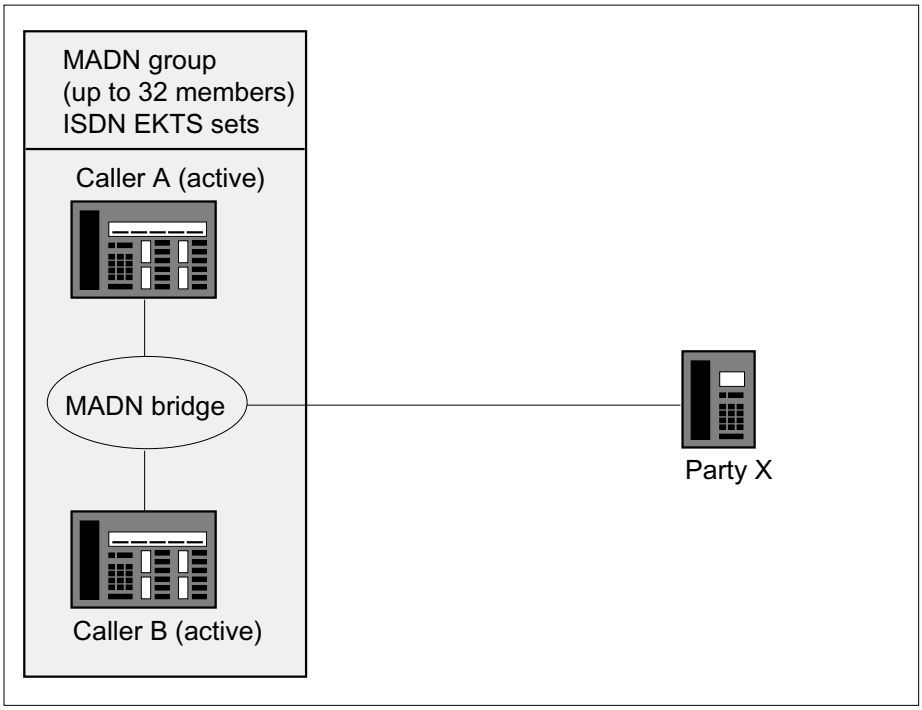
Example 2-MADN bridging, followed by FC conferencing

This example shows a MADN bridging followed by an FC conference:

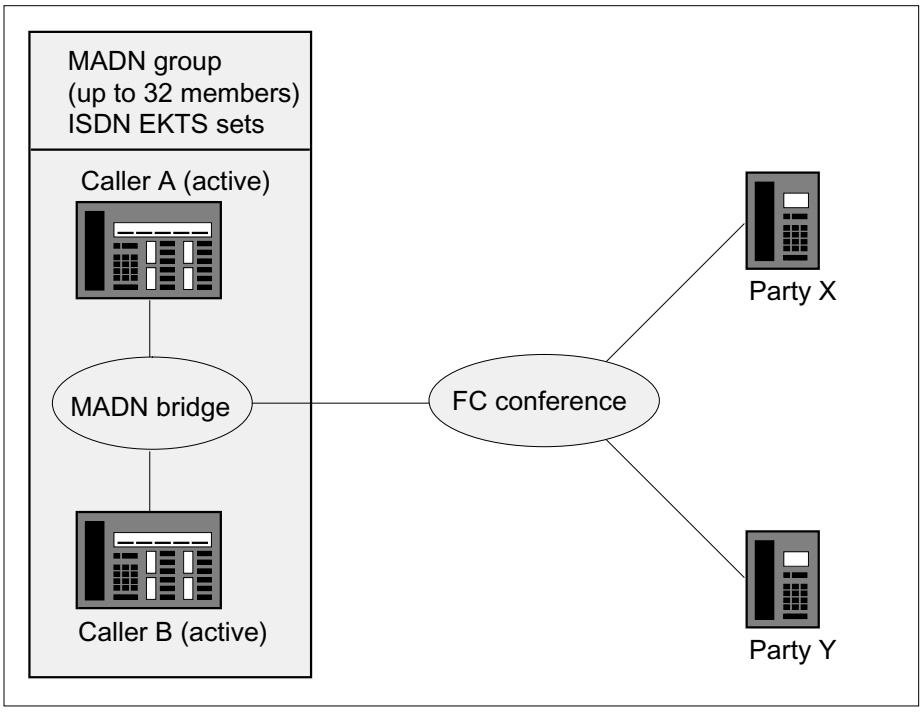
1. Caller A is the primary member of a MADN group and has the FC feature. Caller B, a secondary member of the MADN group, is idle Caller A creates a two-party call with party X.



2. Caller B presses the MADN DN key to MADN bridge into the two-party call created by caller A. Caller B MADN bridges into the call.



3. Caller A creates an FC conference with party Y. Party Y communicates with callers A and B, and party X.



MADN/Flexible Calling Interworking for ISDN (continued)

Note 1: Caller A (FC controller) cannot invoke FC transfer if one or more MADN group members are part of the MADN bridge.

Note 2: If caller A (FC controller) releases from the MADN bridge, the MADN bridge collapses. Caller B remains in an FC conference with parties X and Y. Caller A continues to be the FC controller.

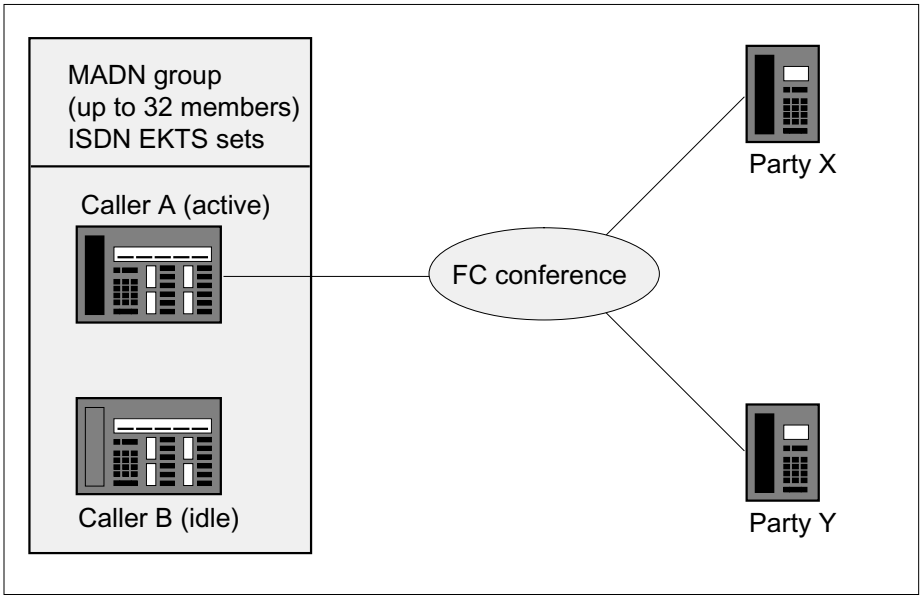
Note 3: If caller B releases the MADN call, the MADN call clears. If caller A has implicit transfer, parties X and Y reconfigure to a two-party call. If caller A has explicit transfer, the call clears.

Note 4: If party X (conferee) drops the call, the FC conference collapses. Callers A and B MADN bridge with party Y. If caller A has the DDC option provisioned, the FC conference circuits release.

Example 3-MADN hold and retrieve with an FC conference

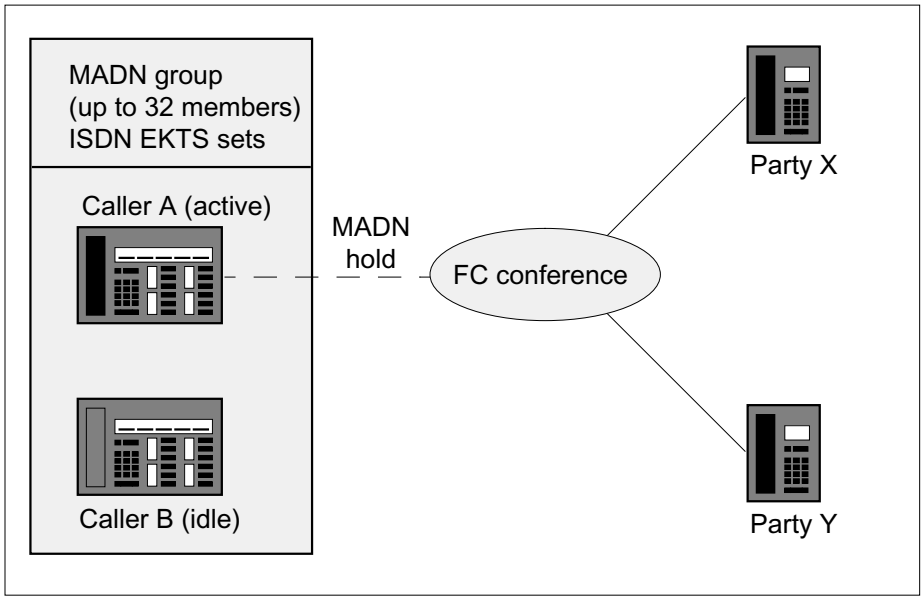
This example shows an FC conference put on MADN hold and retrieved:

1. Caller A is the primary member of a MADN group and has the FC feature. Caller B, a secondary member of the MADN group, is idle. Caller A creates an FC conference with parties X and Y.



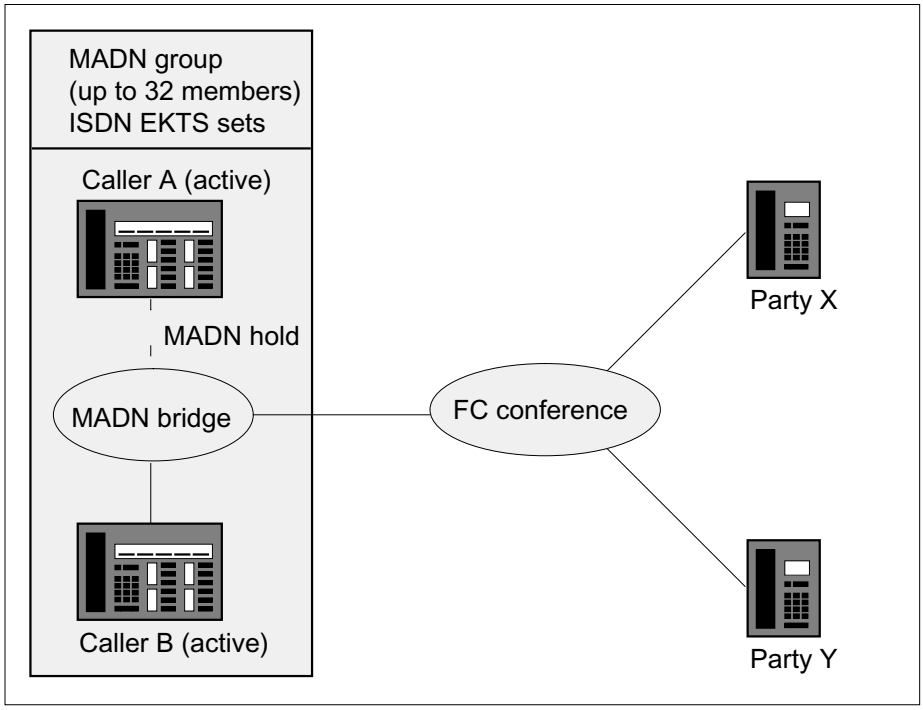
2. Caller A MADN holds the FC conference. Parties X and Y continue to communicate through the FC conference.

MADN/Flexible Calling Interworking for ISDN (continued)



Note: Caller A continues to be the FC controller and maintains the ability to add or drop participants in the FC conference.

3. Caller B retrieves the MADN-held FC conference and communicates with parties X and Y.

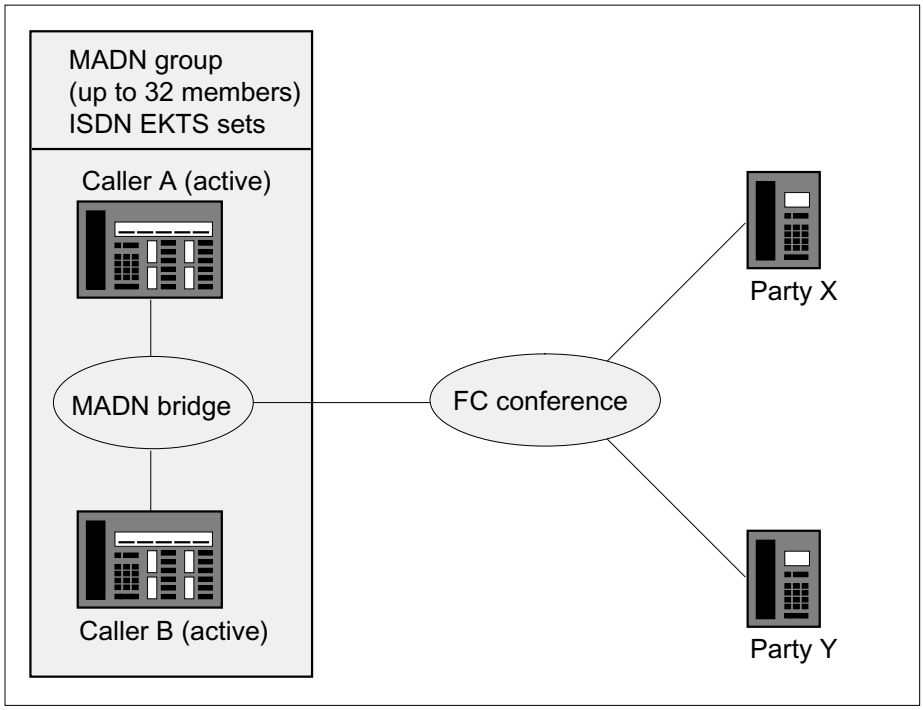


MADN/Flexible Calling Interworking for ISDN (continued)

Note 1: Caller B is not the FC controller; caller A remains the FC controller.

Note 2: While the FC conference is on MADN hold, MADN group members can MADN bridge into the call. Those members can place the call on hold, retrieve the call, or disconnect from the call.

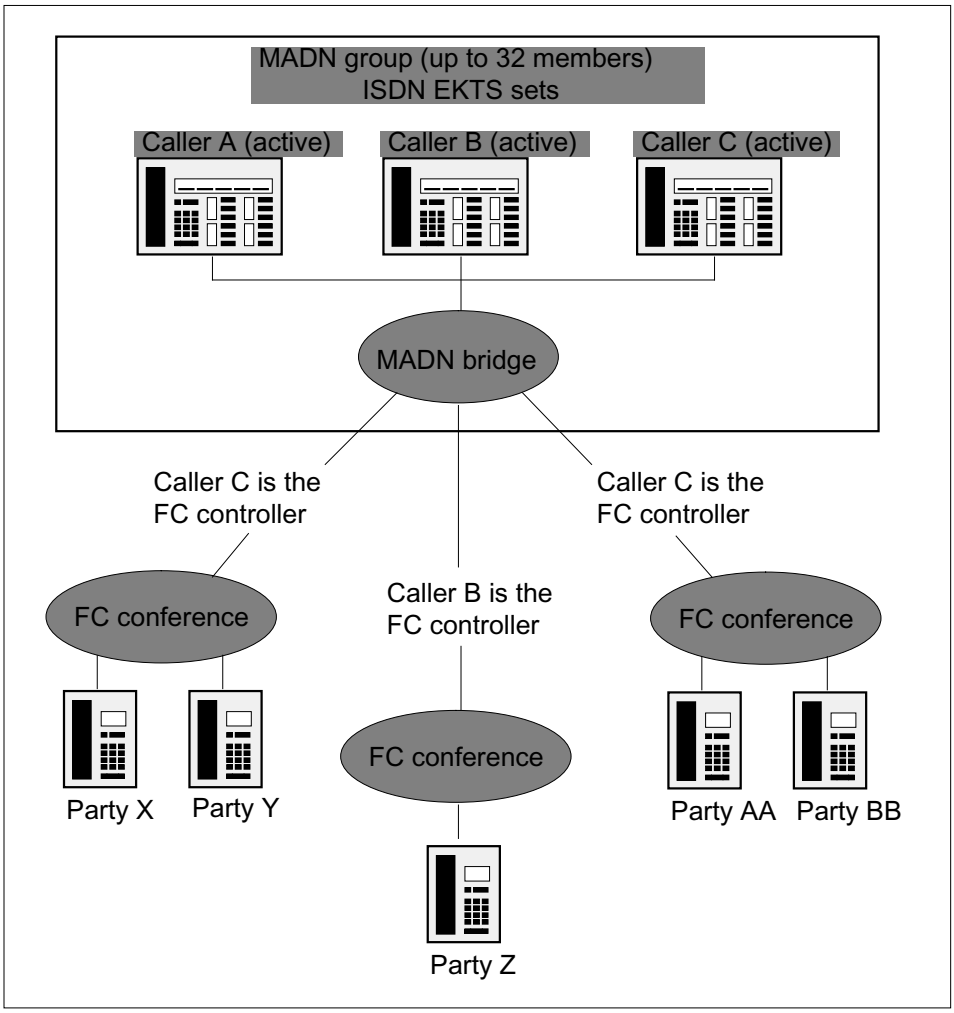
4. Caller A MADN bridges back into the call.



Example 4-Extended con guration of MADN and FC interw orking
This example shows an extended configuration of interworking between MADN bridging and FC conferencing. Callers A, B, and C are MADN group

members in a MADN bridge. Each caller sets up a separate FC conference where

- Caller A is the FC controller for an FC conference with parties X and Y.
- Caller B is the FC controller for an FC conference with party Z.
- Caller C is the FC controller for an FC conference with parties AA and BB.



Note 1: A MADN group can have up to 32 members, and each member, if provisioned, can create a separate FC conference.

Note 2: Three to 30 parties can connect to an FC conference.

MADN/Flexible Calling Interworking for ISDN (continued)

Translations table o w

MADN/Flexible Calling Interworking for ISDN does not affect the translations table flow.

Limitations and restrictions

The following limitations and restrictions apply to MADN/Flexible Calling Interworking for ISDN:

- If the FC controller is part of a MADN bridge, the FC controller cannot transfer or clear an FC conference. Before this feature, if not part of a MADN bridge, the FC controller was able to transfer the call based on the transfer modes
  - — implicit transfer
  - — explicit transfer
- Only MADN group members can MADN bridge into an established FC conference.
- The FC controller can clear the FC conference if no other MADN group members are part of the MADN bridge.
- The MADN group member who creates the FC conference is always the FC controller of that conference. FC controller status is non-transferrable to other MADN group members.
- MADN group members can include ISDN and non-ISDN sets. If a group member with an ISDN set creates an FC conference, group members with non-ISDNs who join in the conference cannot use three-way calling (3WC). In addition, ISDN group members cannot create an FC conference while a non-ISDN MADN member has 3WC active.

Interactions

The following paragraphs describe the interactions between MADN/Flexible Calling Interworking for ISDN and intercom services.

Intercom services

A member can retrieve a Group Intercom call onto a conference on a directory number call appearance provided

- EKTS bridging is active on the directory number call appearance
- no other user on the call appearance has DN bridging active

A member can create an FC conference on an ICM call, and a member can bridge into an established FC conference.

MADN/Flexible Calling Interworking for ISDN (end)

Activation/deactivation by the end user

MADN/Flexible Calling Interworking for ISDN requires no activation or deactivation by the end user.

Billing

MADN/Flexible Calling Interworking for ISDN does not affect billing.

Station Message Detail Recording

MADN/Flexible Calling Interworking for ISDN does not affect Station Message Detail Recording.

Data lling of ce parameter s

MADN/Flexible Calling Interworking for ISDN does not affect office parameters.

Data ll sequence

MADN/Flexible Calling Interworking for ISDN does not affect the datafill sequence.

Translation veri cation tools

MADN/Flexible Calling Interworking for ISDN does not use translation verification tools.

SERVORD

MADN/Flexible Calling Interworking for ISDN does not use SERVORD.

On-demand B-channel X.25 Packet Mode Data Service

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: NI000052

Release applicability

NA014 and up

NA014 introduced On-demand B-channel X.25 Packet Mode Data Service.

Requirements

On-demand B-channel X.25 Packet Mode Data Service has no functional group requirements.

Description

The On-demand B-channel X.25 Packet Mode Data service feature gives the user on-demand X.25 B-channel packet capability. The user establishes B-channel connection between an Integrated Services Digital Network (ISDN) National ISDN-2 (NI2) 2 B-channel/D-channel (2BD) subscriber line and a packet handler (PH) using Q.931 procedures. Once connected, the user can both originate and receive packet-mode data calls over the B-channel. When not being used for packet-mode data, the B-channel is available for voice information (VI) and circuit-switched data (CMD) calls. On-demand B-channel Packet Mode Data allows the sharing of B-channels by VI, CMD, and PMD call types.

Feature 59013271, On-demand B-channel X.25 Packet Mode Data Service—Maintenance, Operational Measurements, and XPM Components, describes maintenance, operational measurements, and XPM components associated with On-demand B-channel X.25 Packet Mode Data Service. Feature 59013206, On-demand B-channel X.25 Packet Mode Data Service—CM Call Processing Component, describes the CM call processing associated with On-demand B-channel X.25 Packet Mode Data Service.

Operation

While provisioning On-demand B-channel (ODB) directory numbers (DN), the following must be remembered:

- ODB DNs can only be provisioned on NI-2 2BD terminals using the SERVORD NEW command.
- ODB DNs can only be provisioned on unmapped LTIDS. When a logical terminal identifier (LTID) is mapped to a line equipment number (LEN),

On-demand B-channel X.25 Packet Mode Data Service (continued)

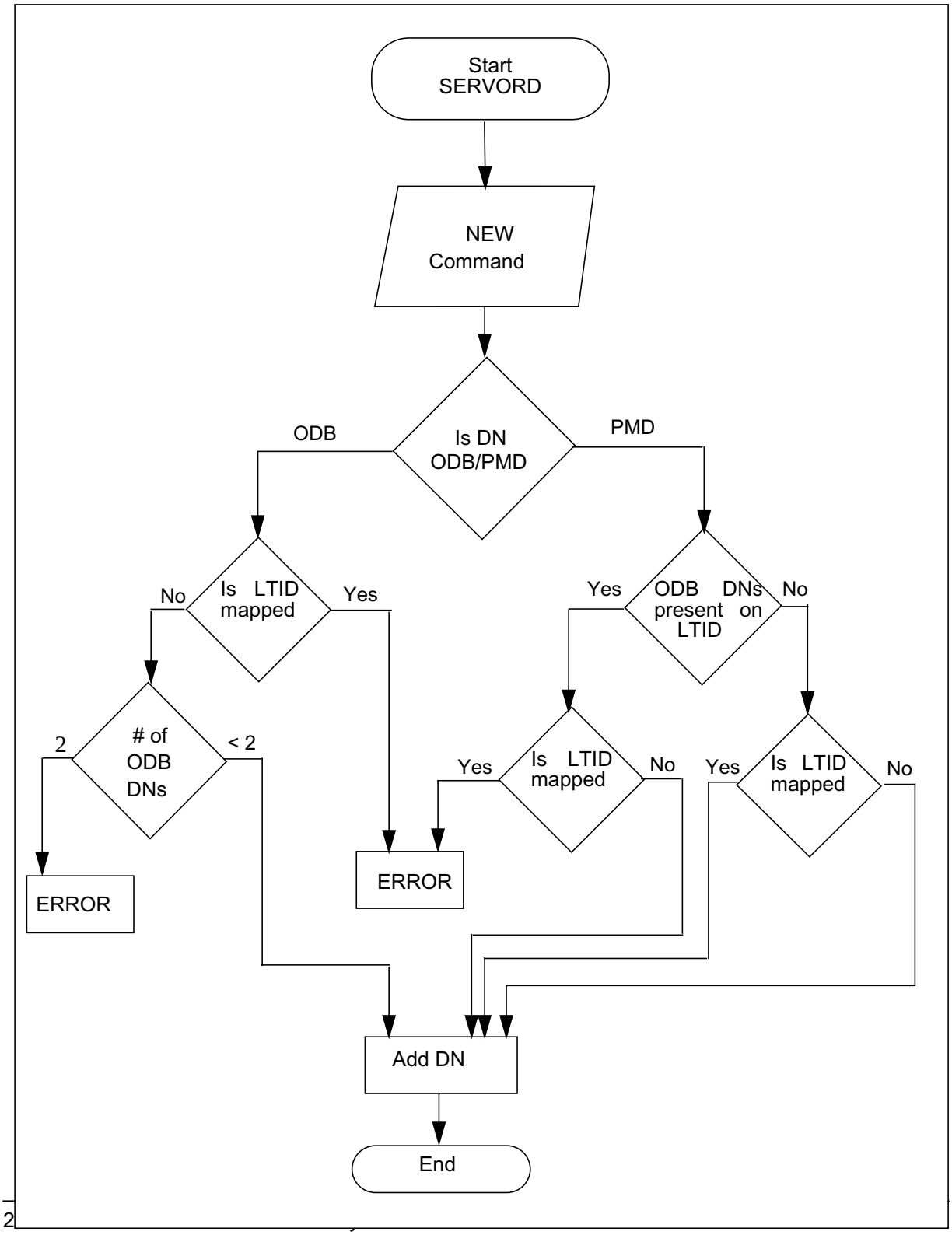
the NEW command will not allow the assignment of ODB DNs or D-packet DNs to that LTID.

- In order to provision an ODB DN or a D-packet DN when the LTID is mapped to a LEN, the LTID must first be detached from the LEN using the SLT DET command.

The following figure contains a flow through chart for provisioning ODB or D-packet DNs on an NI-2 2BD LTID.

On-demand B-channel X.25 Packet Mode Data Service (continued)

Flow through chart for provisioning ODB or D packet DNs on an NI-2 2BD LTID



On-demand B-channel X.25 Packet Mode Data Service (continued)

Sharing of OBD directory numbers

An ODB DN can be shared with DN appearances having call types other than PMD in both a single DN and shared DN configuration.

Single DN con guration

In a single DN configuration, the DN that is shared is present on the same LTID on different keys. In this configuration, an ODB DN

- can be shared with a DN appearance having call type VI, CMD, or VI-CMD
- cannot be shared with a DN appearance having call type PMD. Call type PMD refers to a DN with D-packet service on the D-channel or an ODB DN.

Shared DN con guration

In a shared DN configuration, the DN that is shared is present on different LTIDs. In this configuration, an OBD DN

- can be shared with a DN appearance having call type VI, CMD, or VI-CMD
- cannot be shared with a DN having call type PMD. Call type PMD refers to a DN with D-packet service on the D-channel or an ODB DN.

The following table gives valid single and shared DN configurations for an ODB DN.

Valid single and shared DN con gurations f or an ODB DN

CALLTYPE	CALL TYPE	SHARABLE
PMD (ODB)	VI	YES
PMD (ODB)	CMD	YES
PMD (ODB)	VI_CMD	YES
PMD (ODB)	PMD	NO
PMD (ODB)	PMD (ODB)	NO

On-demand B-channel X.25 Packet Mode Data Service (continued)

Attaching an ODB SLT to a LEN

An LTID that is provisioned with ODB DNs can be attached to a LEN in one of the following ways:

- Using the PHLINK option with the SERVORD ATT command. The user specifies the X.25/X.75 service group (XSG) to which the ODB LTID is to be connected.
- Automatic Resource Assignment (ARA). If the user does not specify an XSG to which to connect the ODB LTID, an XSG is chosen by the ARA. ARA chooses the XSG with the least average throughput and assigns the LTID to ithe XSG.

When invoked this command checks the number of ODB DNs present on the LTID and for each DN does the following:

- creates a CHANNEL object
- associates the DN with the XSG object
- associates the DN with the LINK object

XSG selection criteria for ODB and D-packet service

An LTID can be provisioned with both ODB and D-packet DNs or with just ODB DNs. The following guidelines apply to XSG selection for ODB and D-packet service:

- The XSG selected for ODB service is independent of the XSG selected for D-packet service.
- The XSG selected for ODB service depends on either ARA or the XSG number specified by the user using the PHLINK option of the SLT ATT command.
- The XSG selected for the D-packet service depends on the data entered in table SPECCONN. Table SPECCONN has an entry for the XSG showing its channel as one endpoint and the DCH and its channel to which the LEN is connected as the other endpoint.
- The user can specify the DCHCHNL option to choose a channel on the DCH for the D-packet DNs.
- The packet handler link (PHLINK) option applies only to ODB XSG assignments. The PHLINK option is independent of the DCHCHNL option.

On-demand B-channel X.25 Packet Mode Data Service (continued)

- The DCHCHNL option applies only to D-channel assignments.
- If the user does not specify the DCHCHNL option when using the SLT ATT command, the DMS software chooses the XSG for the D-channel connection from the data entries in table SPECCONN.

Note 1: The Packet Resource Reassignment Tool (PHRRCI) tool allows the user to change the XSG to which ODB DNs are connected. Both ODB DNs will be connected to the same new XSG when the operation completes. The PHRRCI tool also allows the user to change the Bd channel to which D-packet DNs are connected. The PHRRCI commands to change the XSG for ODB DNs and to move the Bd channel for D-packet DNs are different.

Note 2: Refer to the "Packet Resource Reassignment Tool" chapter in the *ISDN BRI Maintenance Guide*, 297-2401-501, for complete information on the Packet Resource Reassignment Tool.

Data Distribution Manager

The DMS software dynamically allocates the channel for ODB at real time. The ODB access channel manager component performs the channel allocation. The ODB software uses a faster messaging system to transfer the dynamically allocated channel_id between the computing module (CM) and the X.25/X.75 link interface unit (XLIU). This faster messaging makes the system more efficient.

The distribution and management of the object data uses the following three step process:

- During provisioning the DMS software creates a pseudo channel, associates the channel object with XSG and Link objects in table LTMAP, and then downloads this information to the XLIU.
- When the user requests an ODB call, the access channel manager allocates the actual channel. The messaging system passes the channel value from the CM to the XLIU.
- The third step in this process occurs when the ODB call is dropped. When the call drops, the channel_id reverts back to its pseudo value. Once the reversion back to the pseudo channel_id completes, the object data is downloaded from the CM to the XLIU.

XLIU

The On-demand B-channel X.25 Packet Mode Data Mode Service feature makes changes in the XLIU software for handling the update of channel information and monitoring to detect the need for the creation of channel and link objects in the HDLC frame processor (HFP) for ODB. The XLIU uses the

On-demand B-channel X.25 Packet Mode Data Service (continued)

following steps to detect the need for creation of channel and link objects for ODB and to update this information in the HFP:

- During provisioning the DMS software create link objects with channel_id(s) that fall in an invalid range and prevents channel and link objects from being created in the HFP. However, the integrated processor and F-bus interface (IPF) contains information on the whole leg of the XSG, Chnl, Link assignment and layer 3 (L3).
- During the ODB call, the channel receives its correct channel_id and channel and link objects are created in the HFP. The channel objects in both the IPF and the HFP contain the correct channel_id.
- When the ODB call drops, the channel_id reverts to an id in an invalid range. The DMS software destroys the channel and link objects in the HFP. The channel object in the IPF is in an invalid channel range.

Limitations and restrictions

The limitations and restrictions that follow apply to the On-demand B-channel X.25 Packet Mode Data Service feature:

- The On-demand B-channel X.25 Packet Mode Data Service feature only supports originating requests. Only the originating leg of the X.25 data path between the originating DTE and its corresponding DCE is available on-demand. The terminating X.25 agent (terminating DTE) is assumed to already be connected to its DCE using a nailed-up connection. This arrangement places the On-demand B-channel Packet Mode Data feature in compliance with critical NI-2 requirements.
- BRI voice features are not available for ODB DNs.
- The On-demand B-channel X.25 Packet Mode Data Service feature supports both single DN and shared DN configurations. The existing restriction prohibiting the sharing of a DN across D-channel packet and B-channel packet (nailed-up packet or ODB packet) continues to apply.
- ODB is supported only on NI-2 2BD terminals.
- The On-demand B-channel X.25 Packet Mode Data Service feature does not implement General Requirement (GR) 199 parameters such as NOBCOEDN and NBCTOEDN.
- Under normal call clearing conditions, only user initiated action is allowed to cause channel disconnection.
- An additional CCB supports the on-demand connection to the XLIU.
- The On-demand B-channel X.25 Packet Mode Data Service feature does not support timer T320.

On-demand B-channel X.25 Packet Mode Data Service (continued)

- When an X.25 call is made on an active B-channel, there is no human machine interface (HMI) available to the user to change that state.
- Query tools are available to observe the status of X.25 calls.
- The On-demand B-channel X.25 Packet Mode Data Service feature does not support nailed-up B-channel specific maintenance commands for ODB.
- Only packet AMA records generate. B-channel usage does not bill or peg.
- OMs that peg for Q.931 do not peg for ODB calls.
- Q.931 initiated connection establishment and X.25 packet virtual connections are treated as two separate call attempts. The respective OMs for each will peg.
- ODB DNs cannot belong to an associated group.
- Called party number (CDN) is assumed to be present only in the X.25 call request packet. Any CDN present in the Q.931 SETUP is ignored.
- Both B-channels can engage in ODB calls. They must use separate OBD DNs for the calls.
- The On-demand B-channel X.25 Packet Mode Data Service feature does not support conditional and unconditional notification requirements.
- On-demand B-channel service is not provided as a default service.
- The On-demand B-channel X.25 Packet Mode Data Service feature does not support channel selection subscription parameters.
- The On-demand B-channel X.25 Packet Mode Data Service feature does not support the maximum throughput class per interface parameter.
- The On-demand B-channel X.25 Packet Mode Data Service feature does not support the minimum throughput class per logical channel number (LCN) parameter.
- The On-demand B-channel X.25 Packet Mode Data Service feature only supports Q.931 to X.25 cause code mapping in the case of premature disconnection of B-channels. Premature disconnect occurs when the user sends a disconnect (DISC) message while there are still packet calls on that channel.
- X.25 to Q.931 cause code mapping is not performed.
- Only two DNs with the ODB option can be provisioned on an LTID.
- The provisioning of an ODB DN requires an unmapped LTID.
- A D-packet DN can be provisioned on an unmapped LTID that is already provisioned with ODB DNs.

On-demand B-channel X.25 Packet Mode Data Service (continued)

- An ODB DN cannot be shared in a single DN configuration with a DN that has call type PMD (D-packet DN or ODB DN).
- An ODB DN cannot be shared in shared DN configuration with a DN that has calltype PMD (D-packet DN or ODB DN or nailed-up B-packet DN).
- An ODB DN cannot belong to either a voice or packet hunt group.
- An ODB DN cannot be part of a permanent virtual circuit (PVC).
- An ODB DN cannot be part of a closed user group (CUG).

Interactions

On-demand B-channel X.25 Packet Mode Data Service does not interact with other functionalities.

Activation and deactivation by the user

On-demand B-channel X.25 Packet Mode Data Service does not require activation or deactivation by the user.

Billing

On-demand B-channel X.25 Packet Mode Data Service does not generate billing records or changes.

Station Message Detail Recording

On-demand B-channel X.25 Packet Mode Data Service does not require Station Message Detail Recording.

Of ce parameter s used by On-demand B-channel X.25 Packet Mode Data Service

On-demand B-channel X.25 Packet Mode Data Service does not generate office parameters.

On-demand B-channel X.25 Packet Mode Data Service (continued)

Data II sequence

The table that follows lists the tables that require datafill to put On-demand B-channel X.25 Packet Mode Data Service into operation. You must enter data into the table in this order.

Data II requirements f or On-demand B-channel X.25 Packet Mode Data Service

Table	Purpose of table
LTDEF (Note)	Logical Terminal Definition defines the logical terminal class and access privileges for the LTID.
KSETINV (Note)	Keyset Inventory associates the type of keyset with the corresponding LTID.
KSETLINE (Note)	Keyset Lines lists each call appearance on the LTID and specifies DN parameters, such as customer group and ring, for the call appearance.
DNCTINFO	Directory Number Call Type Information contains packet service parameters that can be changed without associated logical terminals out of service.
DNCHNL	Directory Number Channel contains packet service parameters that are associated with a D or B channel for each parameter. These parameters cannot be changed without taking the associated logical terminal out of service.
LTMAP	Logical Terminal Mapping associates the LTID with its corresponding LEN.
Note: This table is datafilled through SERVORD; therefore, no datafill procedure examples are provided except for tables KSETLINE and LTMAP. Refer to “SERVORD” for examples of using SERVORD to datafill this table.	

Data II e xample for table LTDEF

The following example shows sample datafill for table LTDEF.

MAP display example for table LTDEF

```
LTKEY      LTAP                                        CLASSREF

NI2 100 2BD BRAFS (NITYPE NI2) (PVC FUNCTIONAL 2) (DTEI)
                  (TSPID 6135551022)$
```

Data II e xample for table KSETINV

The following example shows sample datafill for table KSETINV.

On-demand B-channel X.25 Packet Mode Data Service (continued)

MAP display example for table KSETINV

```
KSETLEN                                SETDATA
                                               OPTIONS
-------------------------------------------------------------

NI2 100 5                            ISDKSET 64 $
```

Data ll e xample for table DNCTINFO

The following example shows sample datafill for table DNCTINFO.

MAP display example for table DNCTINFO

```
KEY                                                OPTIONS
-------------------------------------------------------------

6135551001 PMD PMD (NUI N) (FSA N)(RCA N)(ICS N)(CUGS N)
       (TCN N) (FCPN N) (OCB N) (ICB N) (LCP N) (RPOAB N)$
```

MAP display example for table DNCHNL

The following example shows sample datafill for table DNCHNL.

MAP display example for table DNCHNL

```
KEY                                                OPTIONS
-------------------------------------------------------------

6135551001 B B (LLFSQ MOD8)(LLWS 7)(TI 20)(T2 2)(T3 5)(N2 3)
  (LCA (SLCN 1)(NPVC 2)(NOWI 0)(NNRC 1) (NOWO 0)$) (PLSQ
       MOD8) (NDWS N) (NDPS N) (DTCA N) $
```

Data ll related to On-demand B-c hannel X.25 Packet Mode Data Service for table KSETLINE

The table that follows provides the datafill related to On-demand B-channel X.25 Packet Mode Data Service for table KSETLINE. This table includes only

On-demand B-channel X.25 Packet Mode Data Service (continued)

those fields that apply directly to On-demand B-channel X.25 Packet Mode Data Service.

Data ll related to tab le KSETLINE (Sheet 1 of 3)

Field	Subfield	Entry	Explanation and action
KSETKEY		see subfields	Keyset key. This field consists of subfields LEN and KEY.
	LEN		Line equipment number. This field defines the physical location of the equipment that is connected to a specific telephone line. Because field LEN is common to more than 60 tables, it is documented in a single section to avoid unnecessary duplication. Refer to section “Common entry field LEN” for a complete description of field LEN and associated subfields. For ISDN lines, field LEN consists of subfield LTID. For non-ISDN lines, field LEN consists of subfields SITE, FRAME, UNIT, DRAWER or LSG, SHELF, SLOT, and CIRCUIT.
	KEY	1 to 69	Physical key. Enter the number that is associated with the physical keyset to which the directory number (DN) is assigned. Always assign key 1 to the set's primary DN and enter it before any of the set's other DN keys. For M3000 digital telephones, only keys 1 to 6 can be used. For M2317 digital telephones, only keys 1 to 11 can be used. For an ISDN terminal, enter the feature activator (FA) number. Use keys 1 to 64 only.
FORMAT		DN	Format. Enter DN for regular directory number.

On-demand B-channel X.25 Packet Mode Data Service (continued)

Data ll related to tab le KSETLINE (Sheet 2 of 3)

Field	Subfield	Entry	Explanation and action
DNRESULT		see subfields	Directory number result. This field consists of subfields RING, DN, CUSTGRP, SUBGRP, NCOS, SNPA, and OPTLIST.
	RING	Y or N	Ring set. Enter Y (yes) if the keyset is rung on terminations to this DN; otherwise, enter N (no).
	DN	numeric (up to 15 digits)	Directory number. Enter the DN assigned to the keyset.
	CUSTGRP	alphanumeric	Customer group. Enter the code from tables CXGRP and CUSTHEAD of the customer group to which the keyset is assigned.
	SUBGRP	0 to 7	Subgroup. Enter the subgroup in the customer group to which the keyset is assigned.
	NCOS	0 to 511	Network class of service. Enter the NCOS number that is assigned to the keyset.
	SNPA	numeric	Serving NPA. Enter the serving numbering plan area (NPA) to which the keyset is assigned. The SNPA can be up to seven digits in length.
	OPTLIST	ODB	Enter the list of options that you want to assign to the keyset. Separate each option by a blank space. You can add up to 20 of these options: On-demand B-channel (ODB)
	KSTFMTID	UND, MBS, IVD, BRI	Keyset format identification. Enter the type of keyset: UND for undefined, MBS for Meridian business set, IVD for integrated voice and data, or BRI for an ISDN set. Datafill subfields CALLTYPE and SLBRI_KSET_DATA for an entry of BRI.

On-demand B-channel X.25 Packet Mode Data Service (continued)

Data ll related to tab le KSETLINE (Sheet 3 of 3)

Field	Subfield	Entry	Explanation and action
	CALLTYPE	VI, CMD, PMD, VI_CMD, or UNDEF	ISDN call type. Enter the type of ISDN service: VI for voiceband information, CMD for circuit-mode data, PMD for packet-mode data, VI_CMD for both voice and circuit-mode data, or UNDEF for undefined.
	SLBRI_KSET_ DATA	see subfields	SLBRI keyset data type. This field holds the line attribute (LINEATTR) index for an ISDN line designated as a single line BRI (SLBRI).
	IS_SLBRI	Y or N	Is it SLBRI? This subfield describes if the line is SLBRI. If the answer is N, the switch populates the subfield with a nil LINEATTR ($). If the answer is Y, datafill the following subfield.
	SLBRI_KSET_L ATTR	see subfields	SLBRI keyset line attribute index. See subfields LINEATTR_KEY, XLAPLAN, and RATEAREA.

Data ll e xample for table KSETLINE

The figure that follows shows sample datafill for table KSETLINE using table editor.

On-demand B-channel X.25 Packet Mode Data Service (continued)

Sample data ll e xample for table KSETLINE

```
CI:
>TABLE KSETLINE
TABLE: KSETLINE
>ADD
KSETKEY
>PKT 5 5
FORMAT:
>DN
RING:
>N
DN:
>5551021
CUSTGRP:
>LONS634
SUBGRP:
>0
NCOS:
>0
SNPA:
>613
OPTLIST
>ODB
OPTLIST:
>$
KSFMTID:
>BRI
CALLTYPE:
>PMD
SLBRI:
>N$
TUPLE TO BE ADDED:
PKT   5  5
        DN  N       5551021
       LONS634 0      0 613
                            (   ODB)$
          BRI  PMD N                $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>Y
TUPLE ADDED
```

The following figure shows an example of the MAP display for table KSETLINE.

On-demand B-channel X.25 Packet Mode Data Service (continued)

MAP example for table KSETLINE

```
KSETKEY FORMAT                                    DNRESULT
          KSTFMTID                                  KSTFMTARE

PKT 100 1 DN N 5551001 LON6S34 0 0 613 ODB $ BRI PMD N $
PKT 101 5 DN N 5551002 LONS634 0 0 613 ODB $ BRI PMD N $
PKT 101 6 DN N 5551003 LONS634 0 0 613 ODB $ BRI PMD N $
```

Error messages for table KSETLINE

The error messages that follow apply to table KSETLINE.

Error messages for table KSETLINE

Error message	Explanation and action
ONLY THE DN FORMAT IS SUPPORTED FOR ONTEGRATED TERMINALS ODB OPTION”	DMS operating system response when the user attempts to provision the ODB option on any other format than DN format
“THE RINGING OPTION MUST BE SET TO NO FOR INTEGRATED TERMINALS ODB OPTION”	DMS operating system response when the user attempts to provision the ODB option with ringing set to YES
“CANNOT ASSIGN ODB TO A PDN KEY”	DMS operating system response when the user attempts to provision the ODB option against the primary DN
“THE ENTRY IN THE LTMAP TABLE MUST BE REMOVED FOR THE LTID”	DMS operating system response when the user attempts to update the ODB DN data in table KSETLINE

Data ll related to On-demand B-c hannel X.25 Packet Mode Data Service for table LTMAP

The table that follows provides the datafill related to On-demand B-channel X.25 Packet Mode Data Service for table LTMAP. This table includes only

On-demand B-channel X.25 Packet Mode Data Service (continued)

those fields that apply directly to On-demand B-channel X.25 Packet Mode Data Service.

Data ll related to tab le LTMAP (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
LTKEY		see subfields	Logical terminal key. This field consists of subfields LTGRP and LTNUM.
	LTGRP	alphanumeric (maximum 8 characters)	Logical terminal group. Enter the group of the logical terminal.
	LTNUM	1 to 1022	Logical terminal number. Enter the logical terminal number within the group.
MAPPING		see subfield	Logical terminal mapping. This field consists of subfield MAPTYPE.
	MAPTYPE	LEN	Logical terminal mapping type. Enter LEN and datafill refinement LEN.
	LEN	see subfields	Line equipment number. This field defines the physical location of the equipment that is connected to a specific telephone line. Because field LEN is common to more than 60 tables, it is documented in a single section to avoid unnecessary duplication. Refer to section “Common entry field LEN” for a complete description of field LEN and associated subfields. For integrated services data network (ISDN) lines, field LEN consists of subfield logical terminal identifier (LTID). For non-ISDN lines, field LEN consists of subfields SITE, FRAME, UNIT, DRAWER or LSG, SHELF, SLOT, and CIRCUIT.

On-demand B-channel X.25 Packet Mode Data Service (continued)

Data ll related to tab le LTMAP (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
OPTION		BCH, DCHCHNL, ILDCHNL,LTBYTE, MEM, PHI, TEI, or XSG	Option. This field is a vector of a maximum of two entries. If less than two entries are required, end the list with a $ (dollar sign). Enter the option that is based on the terminal access privilege chosen. Option B-channel (BCH) is used for BRI packet data (that is, for PB [high-speed packet-switched data] type terminals only). Datafill refinement BCH. ***Note:*** TEI is disallowed for packet-only and integrated NITs with dynamic TEI. If the member (MEM) option is checked, then the specified LTID is packet on PRI LTID and a member number must be provided which corresponds to the member number in table TRKMEM.
	XSG	0 to 749	X.25/X.75 service group Enter the number of the X.25 or X.75 XSG to which the provisioned LTID with D-channel packet service is being assigned.
	DCHCHNL	0 to 31	D-channel handler (DCH) channel Enter the DCH to which the loop is connected. NI-2 D-channels can only be datafilled on the 24th channel of a carrier. This option is also valid for all V5.2 ISDN lines. DCHCHNL must be specified for 2BD type terminals. Option ISDN line drawer channel (ILDCHNL) is defined for D-packet switching on ISDN line drawer for remote (ILDR) terminals. Datafill refinement ILDCHNL.

On-demand B-channel X.25 Packet Mode Data Service (continued)

Data Il e xample for table LTMAP

The figure that follows shows sample datafill for table LTMAP using table editor.

Data Il e xample for table LTMAP

```
CI:
>TABLE LTMAP
TABLE: LTMAP
>ADD
LTKEY
>PKT 111
MAPTYPE:
>LEN
LEN:
>ISDN 0 0 0 0
OPTION:
>XSG
XSGNO:
>100
OPTION:
>DCHCHNL
DCHCHNL:
>31
TUPLE TO BE ADDED:
PKT 111 KEN ISDN 00 0 00 00   (XSG 100) (DCHCHNL 31)$
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>Y
TUPLE TO BE ADDED:
```

The following figure shows an example of the MAP display for table LTMAP.

MAP example for table LTMAP

```
LTKEY              MAPPING              OPTION
-------------------------------------------------------------
PKT 100 LEN ISDN 00 0 00 00        (XSG 100) (DCHCHNL 31)$
```

On-demand B-channel X.25 Packet Mode Data Service (continued)

Error messages for table LTMAP

The error messages that follow apply to table LTMAP.

Error messages for table LTMAP

Error message	Explanation and action
XSG xx IS NOT DATAFILLED IN TABLE XSGDEF	The following error message displays if the user attempts to datafill an XSG not defined in table XSGDEF for an ODB LTID:
NO XLIU IS ASSIGNED TO THE XSG DEFINED IN TABLE XSGDEF	The following error messages displays if the user attempts to datafill an XSG defined in table XSGDEF without an XLIU assignment for an ODB LTID:
NO FREE CHANNELS IN THIS XSG	The following error message displays if the user attempts to datafill an XSG that has no free channels for an ODB LTID:
FAILED TO CREATE CHANNEL	The following error message displays if the user attempts to datafill an XSG for an ODB LTID and the creation of the channel object fails:
COULD NOT ASSOCIATE CHANNEL AND LINK OBJECTS	Thefollowing error message displays if the user attempts to datafill an XSG for an ODB LTID and the association of the link and channel objects fails:

Translation veri cation tools

On-demand B-channel X.25 Packet Mode Data Service does not use translation verification tools.

SERVORD

The following SERVORD information applies to the On-demand B-channel Packet Mode Data Service Feature.

On-demand B-channel X.25 Packet Mode Data Service (continued)

SERVORD limitations and restrictions

The SERVORD limitations and restrictions that follow apply to On-demand B-channel X.25 Packet Mode Data Service:

- The following SERVORD commands cannot be used with the ODB option:
  - — ADD
  - — ADO
  - — ADDPH
  - — CHF
  - — DEO
  - — EST
  - — SETPH
- No other options can be assigned to an ODB DN.
- Provisioning of DNs with the ODB option require an unmapped LTID
- Provisioning does not allow the assignment of DNs with the ODB option on an LTID that is already mapped to a LEN.
- Provisioning does not allow the assignment of a D-packet DN on an LTID provisioned with ODB DNs that is attached to a LEN. Adding a D-packet DN requires detaching the of the LTID from the LEN each time a new D-packet DN is provisioned on the LTID.
- Provisioning allows the sharing of ODB DNs with a DN appearances having call types other than PMD in both single and shared DN configurations as follows:
  - — Single DN configuration—an ODB DN can be shared with a DN appearance having call type VI, CMD, or VI-CMD. An ODB DN cannot be shared with a DN appearance having call type PMD. A call type of PMD includes DNs with D-packet service on the D-channel or an ODB DN.
  - — Shared DN configuration—an ODB DN can be shared with a DN appearance having call type VI, CMD, or VI-CMD on different LTIDs. An ODB DN cannot be shared with a DN appearance having call type PMD. A call type of PMD includes DNs with D-packet service on the D-channel or an ODB DN.

On-demand B-channel X.25 Packet Mode Data Service (continued)

SERVORD prompts

The table that follows provides the SERVORD prompts used to assign On-demand B-channel X.25 Packet Mode Data Service to a DN.

SERVORD prompts for On-demand B-channel X.25 Packet Mode Data Service (Sheet 1 of 2)

Prompt	Correct input	Explanation
SO	NEW	Enter NEW to establish service for this DN.
DN	7 digits	Enter DN to add call type.
LCC_ACC	ISDNKSET	Line class code access code. Enter ISDNKSET for NI-2 terminal.
GROUP	Group name	Customer group. Enter the customer group name DN belongs to from table CUSTGRP.
SUBGRP	0 to 7	Customer sub group. Enter sub group of customer group.
NCOS	0 to 511	Network class of service. NCOS defines set of capabilities or restrictions in table NCOS that allows or defines service.
SNPA	3 digits	Serving number plan area. Enter area code for this DN.
KEY	1 to 69	Enter number of the key that the DN will appear on.
RINGING	N	Ringing applied to this DN. Enter N for the PMD service. Only voice circuits have ringing applied.
LATANAME	NILLATA	Local access and transport areaname for DN. Enter LATA name if applicable or otherwise enter NILLATA.
LTG	0 to 9998	Line treatment group of DN. Enter LTG number of DN. LTG 0 is the default.
LEN_or_LTID	Alphanumeric	Logical terminal identifier. Consists of a Logical Terminal group name, one space, and the terminal number. Enter LTID of the terminal this DN is on from table LTDEF.

On-demand B-channel X.25 Packet Mode Data Service (continued)

SERVORD prompts for On-demand B-channel X.25 Packet Mode Data Service (Sheet 2 of 2)

Prompt	Correct input	Explanation
OPTKEY	1 to 69	Option key. Enter key number to assign the option to.
OPTION	ODB	DN option. Enter ODB for the On-demand B-channel option.
OPTKEY	1 to 69	Option key. Enter $ to indicate no further options. ODB DN can not be assigned other options.

SERVORD example to assign On-demand B-channel X.25 Packet Mode Data Service

The SERVORD example that follows shows how to add On-demand B-channel X.25 Packet Mode Data Service to an NI-2 2BD DN with the SERVORD NEW command in prompt mode.

On-demand B-channel X.25 Packet Mode Data Service (end)

SERVORD example for On-demand B-channel X.25 Packet Mode Data Service in prompt mode

```
SO:
>NEW
SONUMBER:      NOW 00 05 21 PM
>(CR)
DN:
>7221000
LCC_ACC:
>ISDNKSET
GROUP:
>LONS634
SUBGRP:
>0
SNPA:
>613
KEY:
>5
RINGING:
>N
LTG: 0
>(CR)
LEN_OR_LTID:
>NI2 100
OPTKEY:
>5
OPTION:
>ODB
OPTKEY:
>$
```

The SERVORD example that follows shows how to add On-demand B-channel X.25 Packet Mode Data Service to NI-2 2BD DN with the SERVORD NEW command in no-prompt mode.

SERVORD example for On-demand B-channel X.25 Packet Mode Data Service in no-prompt mode

```
>NEW $ 722100 ISDNKSET LONS634 0  613 5 N 0 NI2 100 5 ODB $
```

PRI: Base MWI Control Using NI-PRI

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: NA

Release applicability

NA011 and up

NA011 introduced Base Message Waiting Indicator (MWI) Control Using National ISDN Primary Rate Interface (NI-PRI)

Requirements

To operate, PRI: Base MWI Control Using NI-PRI requires AF7569, Non-Call Associated Signalling (NCAS).

Description

Base MWI Control Using NI-PRI provides MWI control that is common to local and remote client users. This activity addresses support of Serving PRI Group as an interface between the DMS-100 switch and the ISDN Message Storage and Retrieval (MSR). Base MWI Control Using NI-PRI functions with pre-NA011 offerings of MWI control for remote client users.

The feature AF7776 allows a host DMS-100 switch to receive and acknowledge MWI control requests using public NI-PRI NCAS connections that are established between the host DMS-100 switch and an ISDN MSR. An NCAS connection allows supplementary services on ISDN class II equipment, such as MWI Control, to communicate with the DMS-100 switch without setting up a circuit switched (B-channel) connection.

Operation

Base MWI Control Using NI-PRI is activated by provisioning the appropriate tables. Users can activate voice mail notification with an access code.

Translations table o w

The list that follows includes the PRI: Base MWI Control Using NI-PRI translations tables:

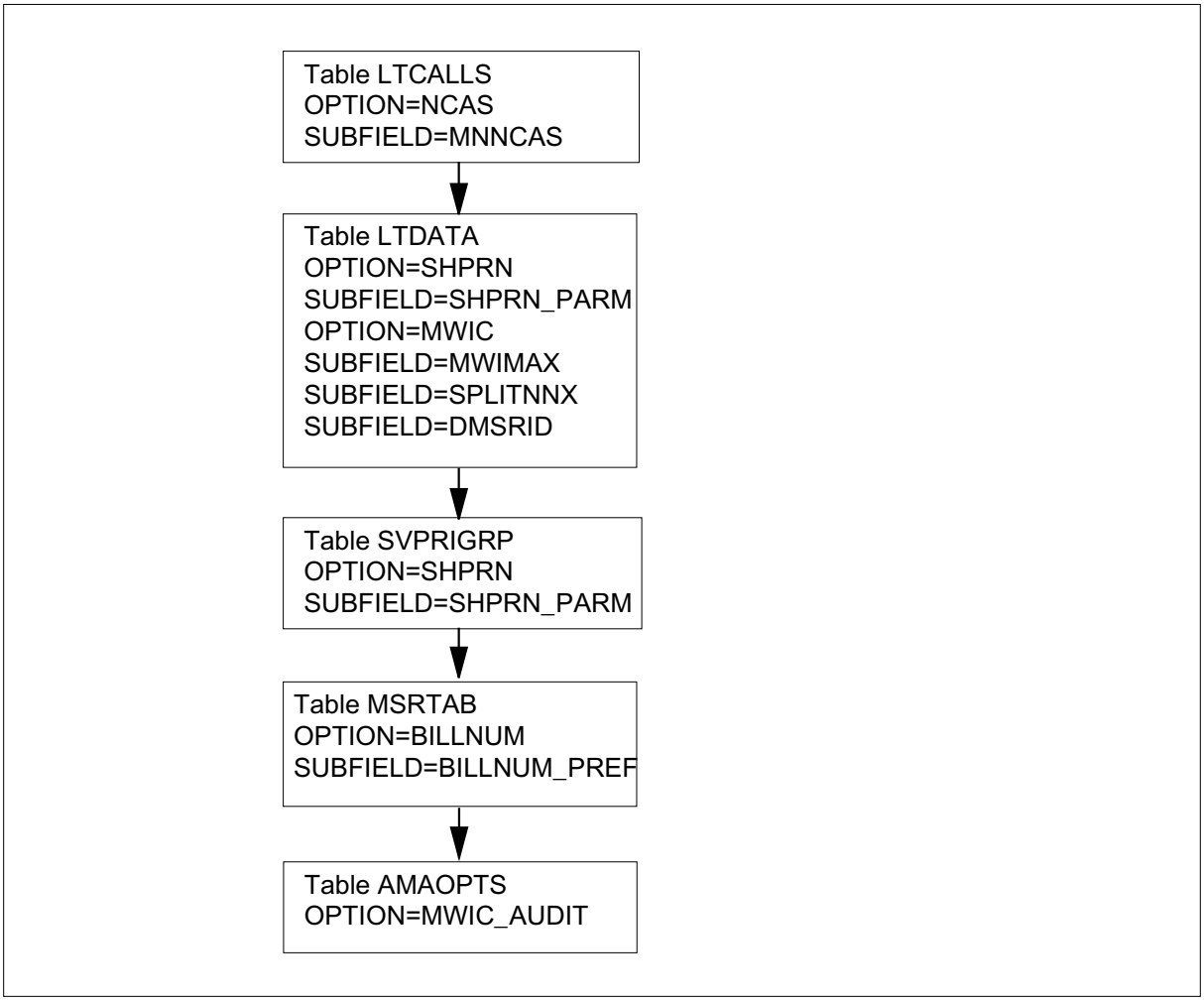
- Table LTCALLS
- Table LTDATA
- Table SVPRIGRP

PRI: Base MWI Control Using NI-PRI (continued)

- Table MSRTAB
- Table AMAOPTS

The flowchart that follows provides the PRI: Base MWI Control Using NI-PRI translations process.

Table o w for PRI: Base MWI Control Using NI-PRI



PRI: Base MWI Control Using NI-PRI (continued)

The table that follows lists the datafill content used in the flowchart.

Data ll e xample for PRI: Base MWI Control Using NI-PRI

Datafill table	Example data
LTCALLS	ISDN 500 PUB XLALEC 0 (NCAS 5) $
LTDATA	ISDN 502 SERV SERV Y SCREENED ALWAYS (RNDELV SCREENED) (SHPRN YYYY) ISDN 503 SERV SERV N N ALWAYS ALWAYS(MWIC 500 N9195551234)$
SVPRIGRP	MSR_SRVGRP1 3 (ISDN 109)(ISDN 110)(ISDN 1111)(SHPRN YYYY)
MSRTAB	6137216050 $ 8197228907 $ 7777777777(BILLNUM 6137223001 N)$
AMAOPTS	MWIC_AUDIT PERIODIC 980620 0000 24 HRS

Limitations and restrictions

The limitations and restrictions that follow apply to PRI: Base MWI Control Using NI-PRI.

Message services directory number provisioning

The following limitations and restrictions apply:

- The ``virtual'' Message Services Directory Number (DN) of table DNROUTE is not explicitly identified as a Message Services DN. The Message Services DN points to an index of the routing tables, which routes calls to the terminating PRI trunk group.
- The routing tables do not prevent a non-ISDN NI-PRI trunk group from being specified as a terminating interface.
- The PRI Super Trunk Group list does not prevent a non-ISDN NI-PRI trunk group from being specified as a terminating interface.

MSRID billing number and automatic message accounting generation

The following limitations and restrictions apply:

- Provisioning

  In table MSRTAB, the maximum number of MSRIDs for an entire switch is limited to 256.

- Automatic Message Accounting/Billing Record

  In the Automatic Message Accounting (AMA) record Daily Aggregate Service Events (DASE) module (code 072), the Interstate count field is used and filled with ``FFFFFF'' in accordance with Bellcore AMA Format

(BAF) fill procedure. All the counts are populated in the Intrastate count field.

North American DN system only

-PRI works only in North American loads using North American DN system. This feature will not work with North American loads using Universal DN system.

Of ce parameter MAX_NUM_PRI_MWIC_CONTR OL

The office parameter MAX_NUM_PRI_MWIC_CONTROL can only be in the range of 8-4500. The DMS-100 switch supports up to 4500 outstanding MWI transactions for the entire switch.

Because of the existence of this office parameter for the entire switch, a verify procedure is in place for the office parameter. During the table control change, when the value of this office parameter is being decreased, the input value is verified against the sum of MWIMAX provisioned on all PRI interfaces. If the input value is less than the sum, the change is rejected with the following error message generated:

```
The value can not be less than the sum of MWIMAX
```

Option SHPRN-serving PRI group con guration

The verification process of table SVPRIGRP fails the attempt to add the special handling of presentation restricted numbers (SHPRN) option under the following conditions:

- Option SHPRN added against non-NI-PRI interface

  The SHPRN option follows GR-866-CORE requirements and is only applicable to the variant NI-PRI. The Serving PRI Group concept is only supported by the variant NI-PRI. If an attempt is made to provision the SHPRN option in table SVPRIGRP, the verification process generates the following error message:

  The SHPRN option and Serving PRI Groups are only supported by the NI-PRI variant only

- Option SHPRN added without CGNDELV and RNDELV

  The SHPRN option follows GR-866-CORE requirements and is only valid with the features CGNDELV and RNDELV in table LTDATA. If adding the SHPRN option to a Serving PRI Group with members that do not have

PRI: Base MWI Control Using NI-PRI (continued)

CGNDELV and RNDELV provisioned, the verification process generates the following error message:

```
Serving PRI Group members must have CGNDELV and RNDELV
features of table LTDATA to provision SHPRN against a Serving
PRI Group
```

The verification process of table LTDEF fails the attempt to change the variant from NI-PRI to any other variant if the interface is part of a Serving PRI Group. The verification process generates the following error message:

```
PGRPID supported for NI-PRI variant only
```

Option SHPRN-single PRI con guration

The verification process of table LTDATA fails the attempt to add the SHPRN option under the following conditions:

- Option SHPRN added against non-NI-PRI interface

  The SHPRN option follows GR-866-CORE requirements and is only applicable to the variant NI-PRI. If adding the SHPRN option to an LTID in table LTDATA that is not defined as NI-PRI, the verification process generates the following error message:

  ```
  SHPRN option is only valid on NI-PRI LTID
  ```

- Option SHPRN added without RNDELV

  Option SHPRN follows GR-866-CORE requirements and is only correct with the option RNDELV in table LTDATA. If adding the SHPRN option to an LTID that does not have RNDELV provisioned, the verification process generates the following error message:

  ```
  The SHPRN option requires RNDELV and CGNDELV set to screened
  before adding the SHPRN option
  ```

The verification process of table LTDEF fails the attempt to change the variant from NI-PRI to any other variant, if the SHPRN option is provisioned against the corresponding LTID in table LTDATA. The verification process generates the following error message:

```
INVALID CHANGE: Delete the SHPRN option entry from table LTDATA
for this interface before changing the PRI variant
```

Outstanding PRI MWI control requests on CM SWACT

Outstanding PRI MWIC control requests are lost on CM switch activity (SWACT).

PRI: Base MWI Control Using NI-PRI (continued)

PRI MWI control processing-call type derivation

The call type (CT) of the client user is not derived from the bearer capability argument that can be provided in the MWI control request. By default, the DMS-100 switch uses CT=VI for basic rate interface (BRI) client users and uses CT=Analog for non-ISDN client users.

PRI MWI control processing-destination DN is a remote client user-TCAP query with MWI control request

The message transfer part (MTP) priority of the transaction capabilities application part (TCAP) query remains 1, which is not compliant with the GR-866-CORE requirement of 0.

Regardless of the type of number (TON) and the numbering plan identifier (NPI) that the destination DN has in the MWI control request, the DMS-100 switch always encodes TON and NPI in the TCAP query as National (00000000) and ISDN Numbering Plan (0001), respectively.

The DMS-100 switch always encodes the MSRID (00001100) in the TCAP query with TON of National (00000000) and with NPI of ISDN Numbering Plan (0001).

Regardless of whether or not bearer capability is present in the MWI control request, the DMS-100 switch always encodes bearer capability in the TCAP query with the following:

- coding standard of International Telegraph and Telephone Consultative Committee (CCITT) standard
- information transfer capability of SPEECH
- transfer mode of circuit mode
- information transfer rate of 64 kbit/s
- bearer capability multiplier/protocol indicator of CCITT mu-law
- multiplier layer ID of user info layer 1

The DMS-100 switch does not include the Calling Party Number (00000010) in the TCAP query.

The DMS-100 switch does not include the MWI Type Identifier (11010111) in the TCAP query.

The DMS-100 switch does not include the Timestamp Identifier (00010111) in the TCAP query.

PRI: Base MWI Control Using NI-PRI (continued)

PRI MWI control processing-intersection set of DN

ITSDN, as described in GR-866-CORE, is not supported.

PRI MWI control processing-operational measurements

The PRIMWIC and MWICTACP operational measurement (OM) groups are maintained on a 30-minute basis, instead of on a special study basis.

PRI MWI control processing-optional argument processing

The MWI Control request can include the following optional arguments:

- MSRID

  The DMS-100 switch screens the MSRID optional argument in an MWI control request. The DMS-100 switch does not use the MSRID to screen against the authorized MSRID assigned to a client user in order to update the user's MWI.

  If the MSRID optional argument is not present in the MWI control request, the DMS-100 switch associates the request with the default MSRID of the NI-PRI.

- bearer capability

  The DMS-100 switch does not process the bearer capability optional argument in an MWI control request.

- calling party number

  The DMS-100 switch does not process the calling party number optional argument in an MWI control request.

- timestamp

  The DMS-100 switch does not process the timestamp optional argument in an MWI control request.

- MWI type

  The DMS-100 switch does not process the MWI type optional argument in an MWI control request.

PRI MWI control provisioning-default MSRID

The MSRID entered for the default MSRID must exist in table MSRTAB.

If the default MSRID entered is not in table MSRTAB, the verification process of table LTDATA fails the attempt to add or change the tuple and the following error message generates:

```
Default MSRID entered is not in table MSRTAB.
```

Table MSRTAB has one limitation. Table MSRTAB does not fail the attempt to delete an MSRID entry even if it is in use by table LTDATA.

PRI MWI control provisioning-option MWIC

The verification process of table LTDATA fails the attempt to add the MWIC option under the following conditions:

- NCAS option not assigned to NI-PRI LTID

  The MWIC option assigned on an NI-PRI LTID in table LTDATA is dependent on the NCAS option assigned on the NI-PRI LTID with PUBLIC service type in table LTCALLS. If the NCAS option does not exist, the verification process generates the following error message:

  ```
  MWIC option is only valid with NCAS option. Ensure that NCAS
  option is assigned to the NI PRI LTID with PUBLIC service
  type in table LTCALLS
  ```

- MWIC option being added to non-NI-PRI LTIDs

  The MWIC option is delivered according to GR-866-CORE requirements, and thus is only applicable to NI-PRI LTIDs. If the MWIC option is being added to a non-NI-PRI LTID, the verification process generates the following error message:

  ```
  MWIC option is only valid on NI-PRI LTID
  ```

- MWIMAX exceeds MAX_NUM_PRI_MWIC_CONTROL

  The MWIMAX parameter, or the total MWIMAX of NI-PRI LTIDs assigned with the MWIC option, must not exceed the OFCENG parameter MAX_NUM_PRI_MWIC_CONTROL. If MWIMAX exceeds parameter MAX_NUM_PRI_MWIC_CONTROL, the verification process generates the following error message:

  ```
  The total MWIMAX must not exceed OFCENG office parm
  MAX_NUM_PRI_MWIC_CONTROL. The current total is
  <total_mwimax>. The allowable MWIMAX value must be less than
  or equal to <allowable_mwimax>
  ```

  Note: Total_mwimax and allowable_mwimax are calculated before displaying the error message.

PRI NCAS processing

The DMS-100 switch does not initiate NCAS connection clearing. Also, the DMS-100 switch does not send Q.931 SETUP NCAS messages to the customer premise equipment (CPE) to initiate an NCAS connection establishment.

PRI: Base MWI Control Using NI-PRI (continued)

PRI NCAS provisioning

The verification process of table LTCALLS fails the attempt to remove the NCAS option when assigning options to NI-PRI LTID that are dependent on NCAS, such as the MWIC option in table LTDATA. The process generates the following error message:

```
NCAS option cannot be removed. There is at least one service
depending on NCAS which must be removed first.
```

Series completion

Series completion is not supported by NI-PRI and message services.

Interactions

The paragraphs that follow describe how PRI: Base MWI Control Using NI-PRI interacts with other functionalities.

Advanced intelligent network

The SHPRN feature interacts with advanced intelligence network (AIN) during construction of the terminating NI-PRI SETUP Message. Existing AIN capabilities are not altered by this feature.

The AIN feature can query a signaling control point (SCP) database and change the controlling components of a call. AIN invokes prior to referencing the SHPRN option of a single or serving PRI group. If AIN is involved in the call, the CGN and RN information in the AIN response message will be utilized. The SHPRN option can override the delivery based on the features CGNDELV and RNDELV provisioned against the corresponding NI-PRI trunk.

Call forwarding/redirecting numbers

NI-PRI supports call forwarding or redirecting numbers (RN) by delivering the original and last forwarding (redirecting) numbers. AF6862, Redirecting Numbers, assists the MSR system in locating the appropriate mailbox to leave the message, and in providing an appropriate greeting when answering the call by the MSR.

The SHPRN feature interacts with RN by providing the capability of disregarding the presentation status of the RN and delivering the redirecting numbers to the MSR system. When the SHPRN feature overrides an RN presentation status of ``prohibited'' and delivers the RN IE to the MSR system, the presentation status is unchanged.

Calling number

The original CGN can be utilized by the MSR system to assist in locating a client user's mailbox to retrieve messages and identify the CGN to the client during message storage. The SHPRN feature provides the capability of disregarding the presentation status of the CGN and delivering the calling number to the MSR system. When the SHPRN feature overrides a CGN presentation status of “prohibited" and delivers the CGN IE to the MSR system, the presentation status is unchanged.

Circular hunt

Message Services employs the NA010 feature AF7338, Circular Hunting, during route selection to a terminating NI-PRI trunk group. A message services DN associated with a PRI super trunk group can apply the circular hunt selection algorithms CHCL and CHCCL to determine a terminating channel.

The datafill sequence is the same as dictated prerequisite for a single PRI, except when provisioning the valid routing table tuple. A route selector of SG is entered with the chosen selection algorithm and the number of hunting attempts. A valid PRI super trunk group of table SUPERTKG completes the necessary provisioning to map a message service DN to a PRI super trunk group.

Electronic key telephone set

The EKTS functionality only supports MWI on the primary member of the EKTS group. When audible MWI per DN is assigned and active, the audible indication is only provided for call originations on a primary member basis.

Two B-channel transfer

The NI-PRI interface connected to an MSR system supports TBCT functionality. A direct call or forwarded call to an MSR system can be one leg of a TBCT. The second leg can be an outgoing call from the MSR system that is in the alerting or unanswered state.

AU2636, Two B-Channel Transfer, allows a user on an NI-PRI trunk to request the DMS-100 switch to connect two independent calls on the controller's interface. If the DMS-100 switch accepts the request, the controller releases itself from the calls and connects the other two users directly.

Action and deactivation by the user

-PRI does not require activation or deactivation by the user.

PRI: Base MWI Control Using NI-PRI (continued)

Billing

The figure that follows is an example of an AMA record generated for call code 183.

Call code 183

```
HEX ID:AA STRUCTURE CODE:40690C CALL CODE:183C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C DATE:21208C ORIG NPA:613C ORIG
NUMBER:7223001C CONNECT TIME: 1922219C MODULE CODE:072C
SERVICE CAPABILITY:030 INTRASTATE EVENT COUNT:
00006C INTERSTATE EVENT COUNT: FFFFFF CHARGING
INDICATOR: 101C IC/INC PREFIX: FFFFFF BEARER
CAPABILITY:299C MODULE CODE:072C SERVICE CAPABILITY:
031C INTRASTATE EVENT COUNT: 00005C INTERSTATE EVENT
COUNT: FFFFFF CHARGING INDICATOR: 101C IC/INC PREFIX:
FFFFFF BEARER CAPABILITY:299C MODULE CODE:000C
```

The table that follows provides information for module code 072.

Module code 072

Information	Field number	Number of characters
Module code	88	4
ISDN signalling or supplementary service capability identification	414	4
Five-digit number (intrastate count)	803	6
Five-digit number (interstate count)	803	6
Charging indicator	64	4
Interexchange carrier	57	6
Bearer capability/call type	412	4

The table that follows provides information for structure code 0690.

Structure code 0690

Information	Field number	Number of characters
Record descriptor word	000	-
Hexadecimal identifier	00	2
Structure code	0	6
Call type	1	4
Sensor type	2	4
Sensor identification	3	8
Recording office type	4	4
Recording office identification	5	8
(Connect) date	6	6
Originating NPA	13	4
Originating number	14	8
(Connect) time	18	8

Of ce parameter s used by PRI: Base MWI Control Using NI-PRI

The table that follows lists the office parameters used by PRI: Base MWI Control Using NI-PRI. For additional information about office parameters, refer to the *Office Parameters Reference Manual.*

Of ce parameter s used by PRI: Base MWI Control Using NI-PRI

Table name	Parameter name	Explanation and action
MAX_NUM_PRI_ MWIC_CONTROL	Maximum number of PRI message waiting indicator control	This office parameter limits the number of outstanding MWI transactions in the DMS switch.

PRI: Base MWI Control Using NI-PRI (continued)

Data ll sequence

The table that follows lists the tables that require datafill to put PRI: Base MWI Control Using NI-PRI into operation. You must enter data into the tables in this order.

Data ll requirements f or PRI: Base MWI Control Using NI-PRI

Table	Purpose of table
LTCALLS	Logical Terminal Calls. Stores service-related data, such as translations, that the DMS switch associates with the call type.
LTDATA	Logical Terminal Data. Stores service-related data associated with the logical terminal identifier (LTID), field LTDKEY, which is the key to this table.
SVPRIGRP	Serving PRI Groups. Defines serving PRI groups.
MSRTAB	Message Storage and Retrieval System. Supports feature Update Message Support for MWI (AU2903).
AMAOPTS	Automatic Message Accounting Options. Controls the activation and scheduling of the recording options for automatic message accounting (AMA).

Data ll related to PRI: Base MWI Contr ol Using NI-PRI for table LTDATA

The table that follows provides the datafill related to PRI: Base MWI Control Using NI-PRI for table LTDATA. This table includes only those fields that apply directly to PRI: Base MWI Control Using NI-PRI.

Data ll related to tab le LTDATA (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
SHPRN		SHPRN_PARM	Special Handling of Presentation Restricted Numbers. This field affects subfield SHPRN_PARM.
	SHPRN_PARM	NNNN, YYYY, YNNY, NNNY, YNYY, NNYY	First letter represents Direct Calls-Calling Party Number. Second letter represents Forwarded Calls-Calling Party Number. Third letter represents Forwarded Calls-Original Number on calls forwarded multiple times. Fourth letter represents Forwarded Calls-Last (or only) Forwarding Number. Default is NNNN.

PRI: Base MWI Control Using NI-PRI (continued)

Data ll related to tab le LTDATA (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
MWIC		MWIMAX, SPLITNNX, and DMSRID	Message Waiting Indication Control Option provides the DMS-100 switch with the capability of accepting an MWI control request over an ISDN NI-PRI trunk group. This field affects subfields MWIMAX, SPLITNNX, and DMSRID.
	MWIMAX	8 to 2000	Maximum number of outstanding MWI Control requests that are supported on the NI-PRI. Default is 200.
	SPLITNNX	Y or N	Used only if the host DMS-100 switch shares the client user's code with another switch. This parameter indicates whether to consider the MWI control request received by the host DMS-100 switch as a remote MWI control request. Y indicates a remote request. N indicates a local request. Default is N.
	DMSRID	10 (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)	Default parameter when no MSRID is supplied by the ISDN MSR system. No default value.

Data ll e xample for table LTDATA

The figure that follows shows sample datafill for table LTDATA.

MAP example for table LTDATA, datatype SERV, option SHPRN

```
LTDKEY    LTDRSLT

------------------------------------------------------------------------
ISDN    502 SERV SERV Y SCREENED ALWAYS (RNDELV SCREENED) (SHPRN YYYY)
```

MAP example for table LTDATA, datatype SERV, option MWIC

```
LTDKEY
                                                              LTDRSLT

------------------------------------------------------------------------
ISDN    503 SERV
SERV N N ALWAYS ALWAYS (MWIC 500 N 9195551234)$
```

PRI: Base MWI Control Using NI-PRI (continued)

Error messages for table LTDATA

The error messages that follow apply to table LTDATA.

Error messages for table LTDATA

Error message	Explanation and action
`The SHPRN option is only supported by the NI-PRI variant defined in table LTDEF`	An attempt was made to provision SHPRN and the corresponding LTID in table LDEF is not defined as NI-PRI.
`INVALID CHANGE: Delete the SHPRN option entry from table LTDATA for this interface before changing the PRI variant`	An attempt was made to change the variant from NI-PRI to another variant while the SHPRN option was provisioned.
`The RNDELV option of table LTDATA must be provisioned to datafill SHPRN`	An attempt was made to provision SHPRN and the RNDELV option was not present.

Data ll related to PRI: Base MWI Contr ol Using NI-PRI for table LTCALLS

The table that follows provides the datafill related to PRI: Base MWI Control Using NI-PRI for table LTCALLS. This table includes only those fields that apply directly to PRI: Base MWI Control Using NI-PRI.

Data ll related to tab le LTCALLS

Field	Subfield	Entry	Explanation and action
NCAS		MNNCAS	Non-Call-Associated Signaling option. This field affects subfield MNNCAS.
	MNNCAS	1 to 20	The MNNCAS (maximum number of NCAS) of the NCAS option provides the maximum number of NCAS connections established against only a NI-PRI trunk with a PUBLIC service type at any given time. The default value is 1.

Data ll e xample for table LTCALLS

The figure that follows shows sample datafill for table LTCALLS.

MAP display example for table LTCALLS for PRI: Base MWI Control Using NI-PRI for the NCAS option

```
           LTID                     XLARTSEL
                                                         OPTIONS
________________________________________________________________________

ISDN  500    PUB XLALEC          0  (NCAS 5) $
```

Data ll related to PRI: Base MWI Contr ol Using NI-PRI for table SVPRIGRP

The table that follows provides the datafill related to PRI: Base MWI Control Using NI-PRI for table SVPRIGRP. This table includes only those fields that apply directly to PRI: Base MWI Control Using NI-PRI.

Data ll related to tab le SVPRIGRP

Field	Subfield	Entry	Explanation and action
SHPRN		SHPRN_PARM	Special Handling of Presentation Restricted Numbers. This field affects subfield SHPRN_PARM.
	SHPRN_PARM	NNNN, YYYY, YNNY, NNNY, YNYY, NNYY	This optional parameter enables the DMS switch to override the delivery of presentation restricted numbers for a servicing PRI group interface. Under specific conditions, calls offered to a terminating servicing PRI group can override the delivery restrictions and can provide an MSR system and/or intelligent peripheral (IP) with the calling number (CGN) and/or the redirected number (RN). The presentation status of the information elements (IE) remains unchanged. The DMS switch delivers the CGN and RN IE to an MSR system or IP with an unaltered presentation status. The default value is NNNN.

Data ll e xample for table SVPRIGRP

The figure that follows shows sample datafill for table SVPRIGRP.

PRI: Base MWI Control Using NI-PRI (continued)

MAP display example for table SVPRIGRP for PRI: Base MWI Control Using NI-PRI with the SHPRN option

```
PGRPID                    NUMMEM    MEMBERS
-------------------------------------------------------
MSR_SRVGRP1 3 (ISDN 109) (ISDN 110) (ISDN 111)
(SHPRN YYYY)
```

Note: CGNDELV and RNDELV of table LTDATA must be set to screened for SHPRN to be provisioned.

Data ll related to PRI: Base MWI Contr ol Using NI-PRI for table MSRTAB

The table that follows provides the datafill related to PRI: Base MWI Control Using NI-PRI for table MSRTAB. This table includes only those fields that apply directly to PRI: Base MWI Control Using NI-PRI.

Data ll related to tab le MSRTAB

Field	Subfield	Entry	Explanation and action
MSRID		10-digit string(0,1,2,3,4,5, 6,7,8,9)	Message storage and retrieval system identification. This field affects subfields BILLNUM and BILLNUM_PREF.
	BILLNUM	10-digit string(0,1,2,3,4,5, 6,7,8,9)	The billnum option associates a billing number with an MSRID.
	BILLNUM_PREF	Y or N	Indicates whether to generate billing or not if activation/deactivation count is equal to zero. Default value of Y.

Data ll e xample for table MSRTAB

The figure that follows shows sample datafill for table MSRTAB.

MAP display example for table MSRTAB

```
        MSRID       OPTLIST

_____________________________________________________________

6137216050                $
8197228907                $
7777777777   (BILLNUM 6137223001 Y) $
```

Data ll related to PRI: Base MWI Contr ol Using NI-PRI for table AMAOPTS

The table that follows provides the datafill related to PRI: Base MWI Control Using NI-PRI for table AMAOPTS. This table includes only those fields that apply directly to PRI: Base MWI Control Using NI-PRI.

Data ll related to tab le AMAOPTS

Field	Subfield	Entry	Explanation and action
OPTION		MWIC_AUDIT	Recording options for Automatic Message Accounting (AMA). This field affects subfield MWIC_AUDIT.
	MWIC_AUDIT	PERIODIC yymmdd 0000 24 HRS	This option provides the DMS-100 switch the ability to generate daily AMA records of aggregate counts of successful MWI control activations and deactivations on an MSRID basis. The MWIC_AUDIT option works in conjunction with the BILLNUM option in table MSRTAB. MWIC_AUDIT schedules the audit to capture the metrics of the new BILLNUM option.

Data ll e xample for table AMAOPTS

The figure that follows shows sample datafill for table AMAOPTS.

PRI: Base MWI Control Using NI-PRI (end)

MAP example for table AMAOPTS

```
OPTION      SCHEDULE
-----------------------------------------------------------
MWIC_AUDIT  PERIODIC 980620 0000 24 HRS
```

Translation veri cation tools

The NCAS portion of this feature does not use translation verification to confirm translations.

SERVORD

-PRI does not use the Service Order System (SERVORD).

Redirecting Number and Reason Delivery for ISDN CFW

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: does not apply

Release applicability

NA011 and up

Software release NA011 introduced Redirecting Number and Reason Delivery for ISDN CFW.

Prerequisites

This document includes all the data table information for this functionality. Complete use of this functionality can require software or hardware not described in this document.

Description

Redirecting Number and Reason Delivery (RND) for integrated services digital network (ISDN) call forwarding (CFW) delivers two redirecting numbers and reasons. This terminator-side feature applies to ISDN Basic Rate Interface (BRI), interswitch, and intraswitch calls over the signaling system 7 (SS7) network. Operating company personnel can control the delivery of the redirecting number (RN) on ISDN BRI lines.

This feature creates the following provisioning options:

- Service Order System (SERVORD) line option RND, which assigns RND to the line
- SERVORD option ARR (Aggregate RND Recording), which records RN availability by call type for billing
- customer group option RND, which assigns RND to all members in the customer group
- option RNID, which allows operating company control of the availability of RND on ISDN BRI lines

The SS7 ISDN user part (ISUP) trunks support delivery of the first and last redirecting numbers/reasons. The SETUP message now includes additional redirecting number and reason for terminations to ISDN lines on the current switch. The incoming ISUP message or the current switch, or both, pull the information.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Without this feature, the operating company cannot control the delivery of the redirecting number or reason. Unless the SUPPRESS option was active, the redirecting number always delivered. Provisioning of RND, like Calling Number Delivery (CND), controls the availability and delivery of the RN. Option ARR, like option ACR (Aggregate CND Recording), separates the billing counts by call type. After the upgrade to NA011 is complete, you can disable or remove the RND functionality, or limit it to each line.

See the “Calling Number Information Services Uniformity (CNISU)" feature description in this document for a description of the NA012 and up office parameter RND_BRI_OFFICE, which is another delivery mechanism for RND.

See the “ISDN Calling Number Delivery/Name and Number Privacy" feature description in this document for more information on CND. See the “ISDN Redirection Services (CFW)" feature description in this document for more information on Call Forwarding.

Operation

For the redirecting number to display, the number passes through three delivery phases: presentation, availability, and delivery. To provision this feature, you can assign RND as a customer group option and a line option. You can provision the RND line option for billing, and you can assign line option ARR to specify billing by call type. Operation of this feature requires the following areas:

- messaging
- presentation
- availability
- delivery
- customer group option RND
- line option RND (which requires office option RND in table RESOFC)
- line option ARR

Messaging

The following flowchart shows the different conditions under which the switch provides redirection information, either by way of common channel signaling 7 (CCS7), SS7/ISUP, or Recommendation Q.931 (ISDN BRI) signaling.

CCS7

The DMS-100 switch completely supports SS7 messaging for RND. This feature makes no changes to current functionality.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Q.931

This feature does change Q.931 messaging. The Q.931 SETUP message now contains Redirecting Number Information Elements (RNIE) for both the first and the last RN. The display information element contains redirection information about the first redirection only. The switch delivers RNIEs if the end user has the RND option on the line or customer group. The switch does not deliver RNIEs if the end user does not have RND on the line.

An RNIE with an RN on the current switch appears as follows.

RNIE full coding-RN on current switch

Field	Coding
TN/NPI	National number in ISDN numbering E.164 plan
SI/PI	Presentation allowed of network-provided numberorpresentation prohibited of network-provided number
RFR	One of (unknown, call forward busy, call forwarding no reply, call forwarding unconditional)
RN digits	NPA-NXX-XXXX whenever availableor no digits if presentation is prohibited

An RNIE with an RN mapped from SS7 appears as follows.

RNIE full coding-mapped from SS7 (Sheet 1 of 2)

SETUP RNIE	ISUP IAM message parameter
First redirecting number RNIE	*Original called number OCN*
Type of number (TON)	Nature of address indication
Numbering plan identification (NPI)	Numbering plan
Origin of number	Screening indicator (SI)
Presentation status	Presentation restriction indicator (PI)
Digits	Digits
Second redirecting number RNIE	*Redirecting number RN*
TON	Nature of address indication

Redirecting Number and Reason Delivery for ISDN CFW (continued)

RNIE full coding-mapped from SS7 (Sheet 2 of 2)

SETUP RNIE	ISUP IAM message parameter
NPI	Numbering plan
Origin of number	SI
Presentation status	PI
Digits	Digits
First redirecting number RNIE	*Redirection information RI*
Reason for redirection (RFR)	Original redirecting reason (ORR)
	Redirecting counter
Second redirecting number RNIE	
RFR	Redirecting reason

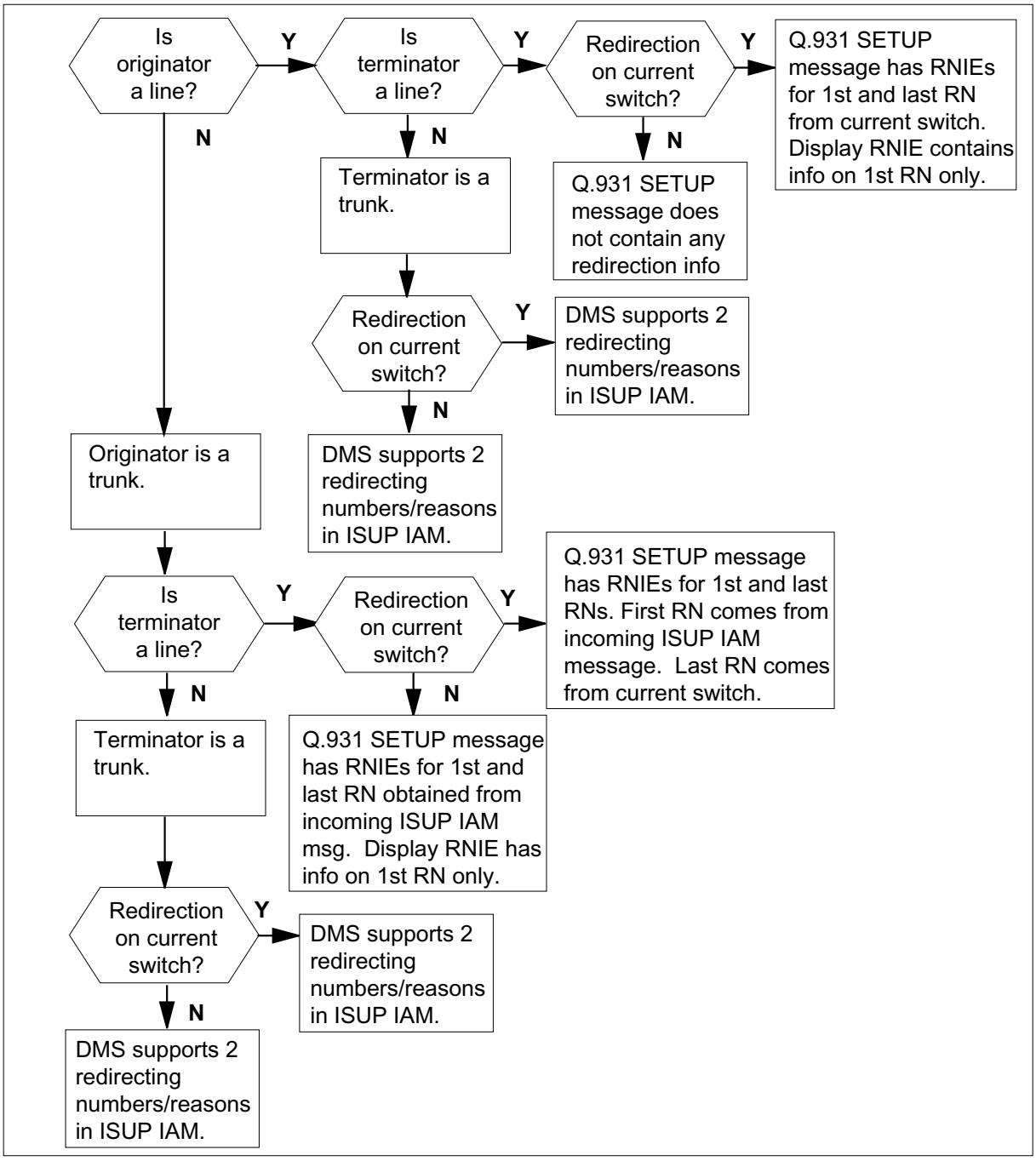
If the end user has the RND option but the RN is not available, the RNIE changes. See the following table.

RNIE modi ed coding f or RN not available

Field	Coding
TN/NPI	Unknown
SI/PI	Presentation prohibited of network-provided number
RFR	Unknown
RN digits	None

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Table o w for DMS-100 messaging for Redirecting Number and Reason Delivery



Presentation

If the presentation indicator equals presentation restricted because of the SUPPRESS option, the RN does not display. The SUPPRESS option operates

Redirecting Number and Reason Delivery for ISDN CFW (continued)

as it does for CND, which means the originator can suppress delivery of the calling number. If call redirectors suppress their calling number, their redirecting number is suppressed.

Availability

For the RN to be available, one of the following three availability mechanisms must exist:

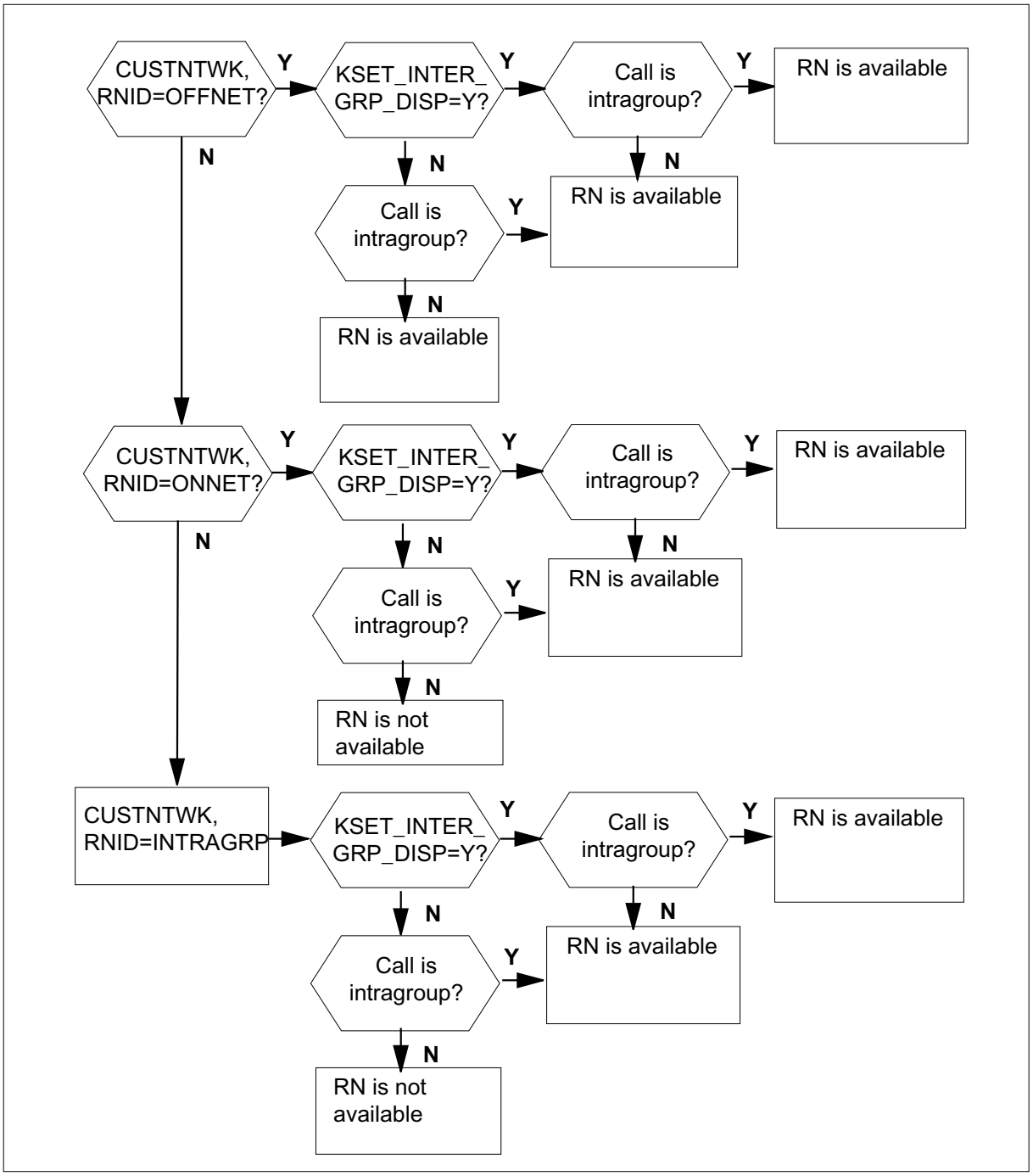
- Enter RNID in table CUSTNTWK with ONNET, OFFNET, or INTRAGRP on the terminator's customer group. The value of the RNID option compared to the network of the call determines the RN's availability (like Calling Line Identification [CLID]).
- The RN is intragroup. All RNs are automatically available to the terminator.
- Set the office parameter KSET_INTER_GRP_DISP in table OFCENG to Y. This setting makes all RNs available to the terminator.

This feature creates the RNID option in table CUSTNTWK, which controls intragroup availability of RND. Indicate the type of network calls for which the option applies in field RNIDOPT. Set this field to ONNET for calls that originate on the same network as the called party. Set this field to OFFNET for all network calls. Set this field to INTRAGRP for intragroup calls.

The following flowcharts assume that the presentation indicator in the SETUP message equals presentation allowed. RND uses the suppression status method that CND uses. The following flowchart shows if the RN is available for delivery when the call is OFFNET. The RN is always available unless field RNID equals INTRAGRP and the office parameter equals N for an intragroup call.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Table o w for availability of RN when call is OFFNET

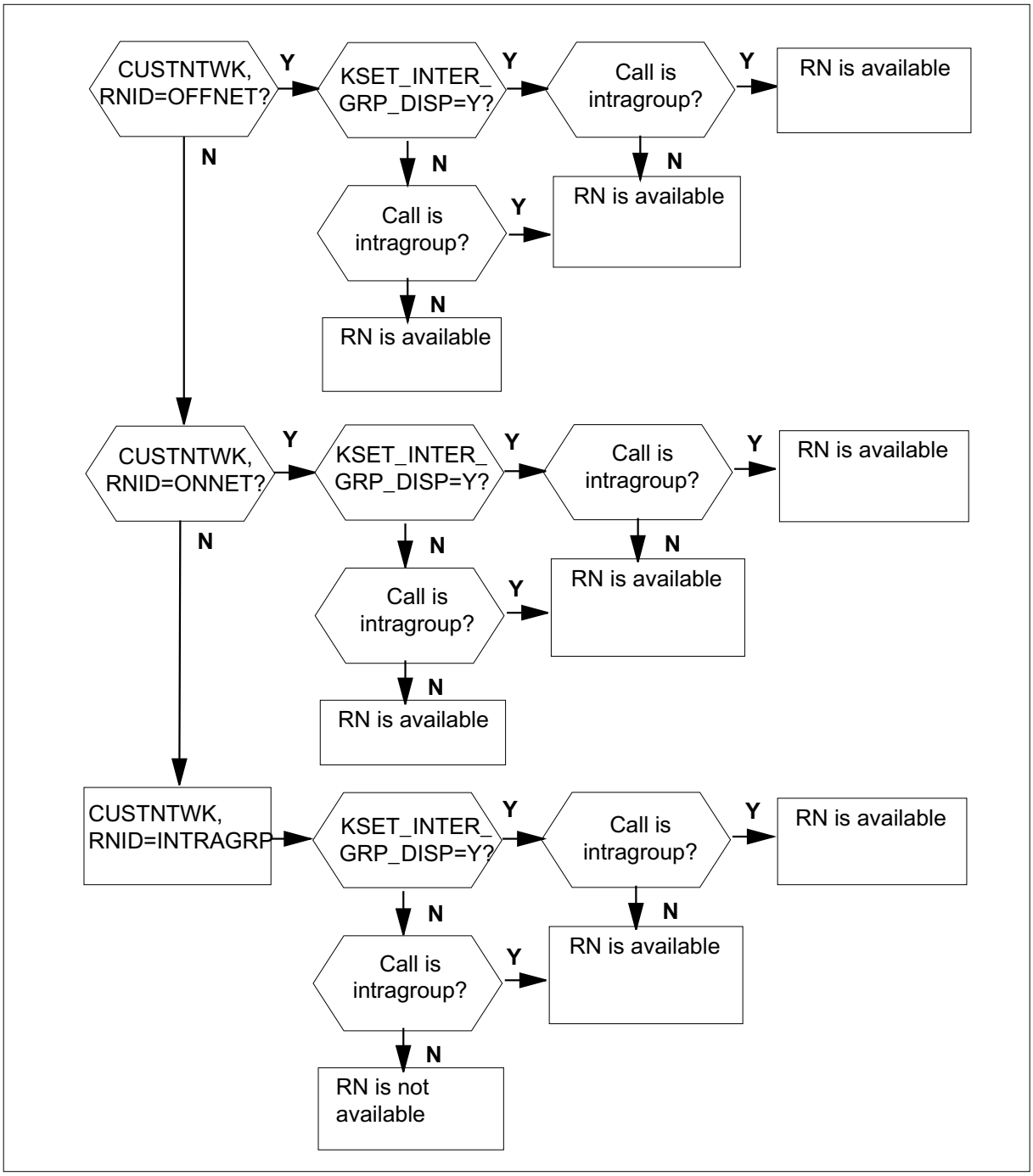


Redirecting Number and Reason Delivery for ISDN CFW (continued)

The following flowchart shows if the RN is available for delivery when the call is ONNET. The RN is always available unless field RNID equals INTRAGRP and the office parameter equals N for an intragroup call.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Table o w for availability of RN when call is ONNET



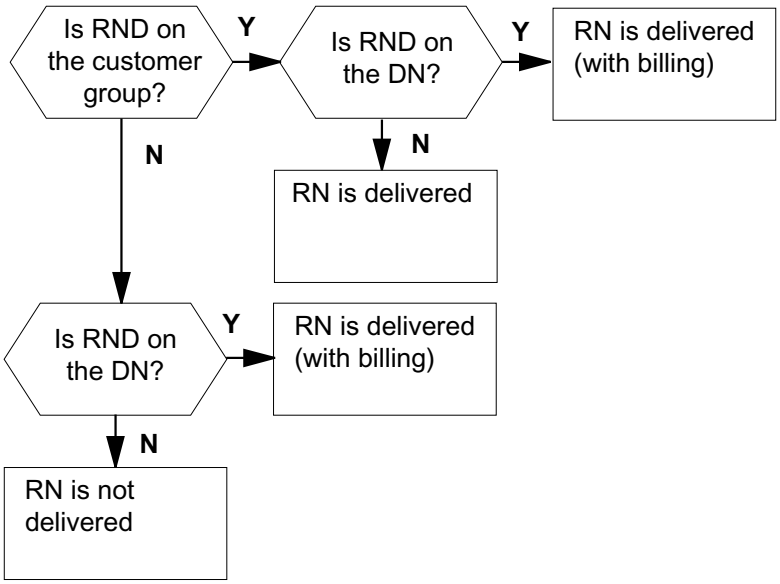
Redirecting Number and Reason Delivery for ISDN CFW (continued)

Delivery

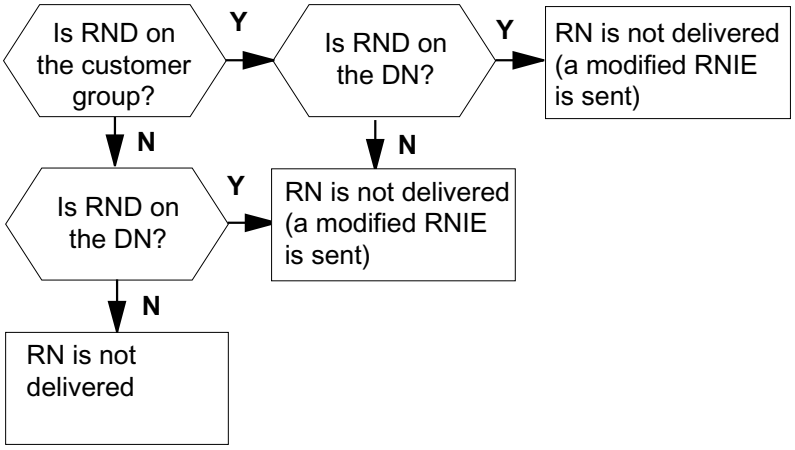
The following flowchart, depending on the availability status, shows if the RN delivers.

Table o w for delivery of RN when available and not available

When RN is available



When RN is not available



Redirecting Number and Reason Delivery for ISDN CFW (continued)

You can provision this service for each customer group and for each ISDN line. In each event, the subscriber receives RN delivery if an availability mechanism is present. The SUPPRESS option cannot be on the redirector, or the number is suppressed.

Customer group option RND

Add option RND to the customer group in table CUSTSTN to set RND for a customer group. Billing does not apply.

Line option RND

Add option RND to the DN by SERVORD to set RND for an ISDN line as flat-rate or SUSP. SERVORD automatically updates table RESFEAT with a tuple for each DN assigned the RND option.

For the line option to work, enter Y in the ENABLED subfield for the RND tuple in table RESOFC. Set field ACCESS to SUBSCR for subscription access only billing. Universal access does not apply to RND. You cannot set RND to apply to an entire office in table RESOFC. The RND tuple in table RESOFC only enables the RND line option.

SUSP billing

Set RND to bill as subscription usage sensitive pricing (SUSP) by setting SUSP to ON in table AMAOPTS. You must also indicate AMA when you assign RND by SERVORD. As a SUSP option, the subscriber uses the CNDA and CNDD access codes from table IBNXLA. These access codes, which other display features use, activate and deactivate RND.

The status of SUSP RND is inactive on a DN by default. To activate RND the subscriber dials the CNDA activation code. Enter a tuple for CNDA and CNDD in the FEATURE subfield of table IBNXLA with the chosen key assignment.

One billing record is produced. If option ARR is on the DN, then two call type-specific records output.

Flat-rate billing

Set RND to bill flat rate by setting SUSP to OFF in table AMAOPTS. Flat-rate still applies if SUSP is ON and you indicate NOAMA when you assign RND by SERVORD.

The status of flat-rate RND is active when you add the option to a DN. The subscriber does not have to activate the option.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Line option ARR

This feature creates line option ARR, which records the number of available and not available RND deliveries by call type. Option ARR determines the difference between voiceband information (VI) and circuit-mode data (CMD) RND deliveries. Counts output based on call type in the AMA records for ARR, which allows you to monitor and bill according to call type.

Like option ACR, which applies to CND, option ARR produces two call type-specific billing records when ARR is on the DN.

Translations table o w

The list that follows includes the Redirecting Number and Reason Delivery for ISDN CFW translations tables:

- Table RESOFC enables line option RND for an office. Set field ENABLED to Y for RND to function when you add RND to a DN. Enter SUBSCR in subfield ACCESS, field FEATDATA for subscription access.
- Table CUSTSTN lists the station options assigned to each customer group. Add the RND option to the customer group to assign it to a business group. Enter RND in field OPTNAME and field OPTION.
- Table RESFEAT contains the assignment of CLASS features for residential lines, many of which apply to ISDN lines also. SERVORD automatically updates or creates a tuple for RND.
- Table AMAOPTS controls the activation and planning of the recording options for automatic message accounting (AMA). Table AMAOPTS contains one tuple for every option, and at the start contains the default values for each of these options. Enter SUSP in field OPTION and specify ON or OFF depending on if you want to bill for usage or flat rate.
- Table IBNXLA stores the data for the digit translation of calls. This table also stores the access codes for features that require them. Option RND uses the display codes CNDA and CNDD for subscriber activation of RND SUSP.
- Table KSETLINE contains a tuple for each DN on a set which indicates the features that exist on the DN. SERVORD automatically updates or creates a tuple for line option ARR.
- Table CUSTNTWK allows the operating company to assign or prevent calling features to customer groups. Option RNID controls if number delivery is available for all BRI lines in the customer group. Enter RNID in field OPTIONS of the terminator's customer group tuple and a value of

Redirecting Number and Reason Delivery for ISDN CFW (continued)

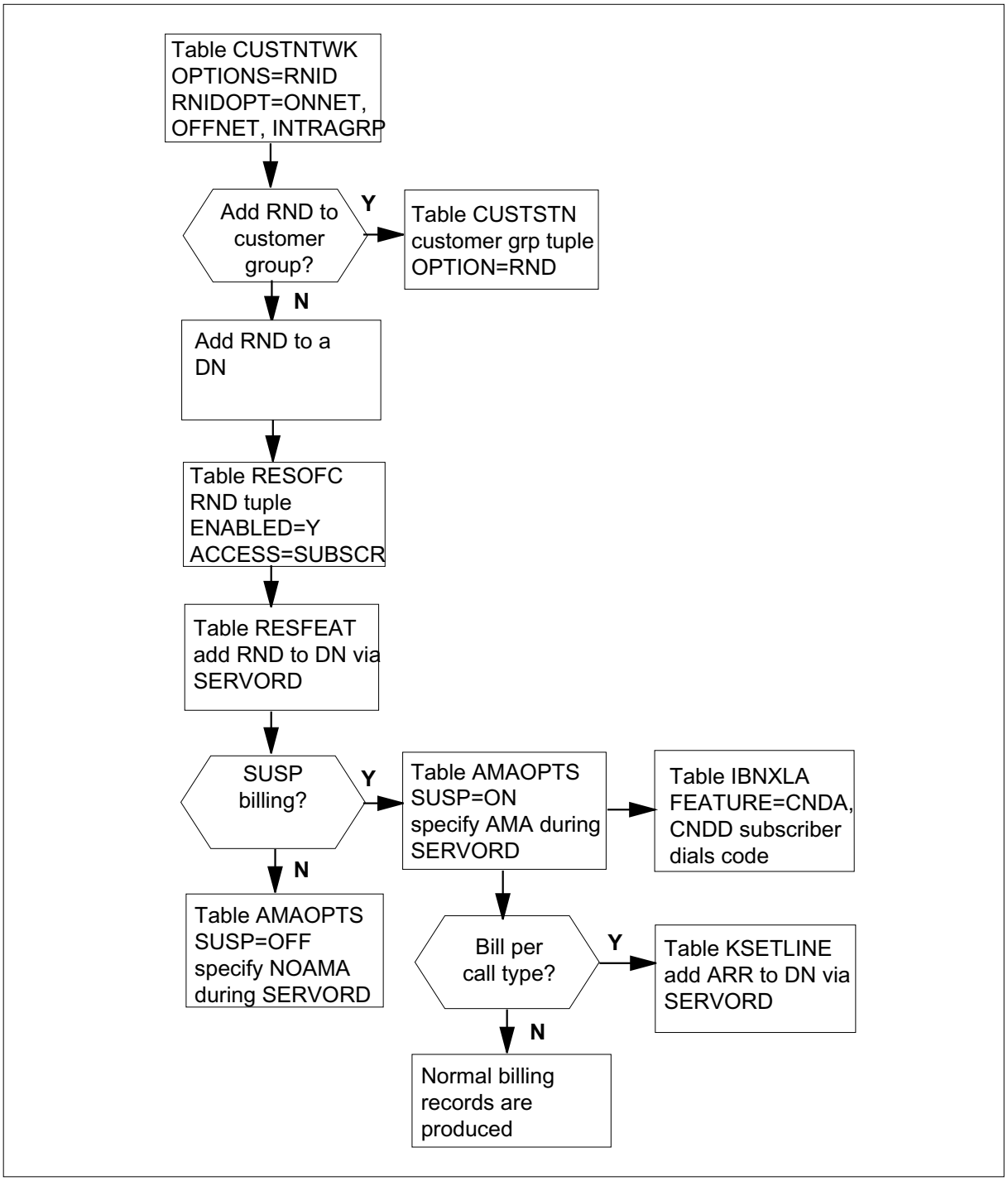
INTRAGRP, ONNET, or OFFNET in subfield RNIDOPT. This value, compared to the network of the call, determines the RN's availability.

- Table OFCENG contains data on engineering parameters for the office. Refer to “Datafilling office parameters" for how this feature affects office parameters.

The flowchart that follows provides the Redirecting Number and Reason Delivery for ISDN CFW translations process.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Table o w for Redirecting Number and Reason Delivery for ISDN CFW



Redirecting Number and Reason Delivery for ISDN CFW (continued)

The table that follows lists the datafill content used in the flowchart.

Data ll e xample for Redirecting Number and Reason Delivery for ISDN CFW

Datafill table	Example data
RESOFC	RND N RND SUBSCR $
CUSTSTN	ISDNGRP RND RND
RESFEAT	WITS 1 1 RND RND AMA ACT 0 0 0 0
AMAOPTS	CIDSUSPAUD ONSUSP ON
IBNXLA	ISDNXLA 72 FEAT N N CNDAISDNXLA 75 FEAT N N CNDD
KSETLINE	WITS 1 1 DN Y 7235201 BNR 0 0 613 (ARR) $ BRI UNDEF

Limitations and restrictions

The limitations and restrictions that follow apply to Redirecting Number and Reason Delivery for ISDN CFW:

Redirection display is not supported on ISDN BRI sets if the forwarded base station is a POTS line using POTS call forwarding.

This feature applies to PVC Functional terminals only.

Interactions

The paragraphs that follow describe how Redirecting Number and Reason Delivery for ISDN CFW interacts with other functionalities.

Advanced Intelligent Network (AIN)

This feature does not support redirection information from AIN.

Automatic Line (AUL)

You cannot add RND SUSP to the same line as AUL.

Call Reference Busy Limit (CRBL)

The parent DN controls RN delivery to CRBL call appearances.

Denied Origination (DOR)

You cannot add RND SUSP to the same line as DOR.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Hunt groups

Each DN in a hunt group must have the RND option assigned to receive redirecting number delivery. The DMS switch does not support the delivery of redirecting numbers to a Directory Number Hunt (DNH) pilot or member for local (non-ISUP) redirections. The switch does support the delivery of RNs to a DNH pilot or member for ISUP redirections.

The DMS switch does not support the delivery of RNs to a Distributed Line Hunt (DLH) or Multiline Hunt (MLH) pilot or member for local (non-ISUP) no answer redirections. The switch does support RN delivery to a DLH or MLH pilot or member for ISUP no answer redirections.

EKTS Multiple Appearance DN (MADN) Call Appearance Call Handling (CACH)

For ISDN lines, RND on the primary member of a MADN group controls RND for the group. Non-ISDN lines always get RND. If the primary member of a MADN group is non-ISDN, all secondary ISDN and non-ISDN members always get the redirection information. If the primary member is ISDN, the RND control of the primary controls the secondary ISDN members also. The non-ISDN secondary members continue to get the redirection information.

Shared DNs

You must assign option RND to each DN appearance on separate logical terminal identifiers (LTID). When you assign RND to one appearance of a shared DN on an LTID, RND does not appear on that shared DN on other LTIDs.

Activation/deactivation by the end user

The subscriber activates and deactivates RND SUSP. First, set the SUSP tuple in table AMAOPTS to Y. Then, add the RND option by SERVORD to the DN with field BILLING_OPTION set to AMA. The subscriber then uses the CNDA and CNDD activation codes for RND. RND SUSP is inactive when you first add it to a DN. The subscriber activates RND by dialing the CNDA code.

The subscriber does not activate or deactivate flat-rate RND.

Activation of RND by the end user

At your telephone

1 Go off-hook.

Response:

Dial tone

Redirecting Number and Reason Delivery for ISDN CFW (continued)

2 Dial the CNDA activation code.

Response:

Con r mation tone

3 Go on-hook.

Response:

You receive redirecting party information when you receive a call, depending on the setting of RNID in table CUSTNTWK. Billing occurs when a number displays on your set.

Deactivation of RND by the end user

At your telephone

1 Go off-hook.

Response:

Dial tone

2 Dial the CNDD deactivation code.

Response:

Con r mation tone

3 Go on-hook.

Response:

You do *not* receive redirecting party information when you receive a call, no matter what the setting of RNID in table CUSTNTWK. Billing does not occur when the feature is inactive.

Billing

This feature creates module code 507, which allows operating companies to bill for RND. The CLASS AMA record of call code 264/structure code 0110 with module code 507 added to the end generates for daily RND use. Structure code 0110 has the Calling Number Delivery (CND) feature code 080 and two counts set to hex *Fs*. This datafill, with module code 507, indicates an RND record.

When the ARR option is on a DN that has RND, two separate billing records (RND available and not available by VI and CMD call type) are produced. The ISDN core module, code 071, appends with the call type.

This record outputs for the following reasons:

- daily audit
- when you remove option RND from a DN
- when you add option ARR to a DN with RND present, or you remove option ARR from a DN

Redirecting Number and Reason Delivery for ISDN CFW (continued)

If ARR is present when the audit runs or when you remove RND from a DN, call type-specific records generate. One VI and one CMD record generate, each with module 071 (ISDN core module) added to the end to indicate the call type.

To produce the RND AMA record, ensure that the following conditions occur:

- The office has the Bellcore AMA package.
- Set SUSP in table AMAOPTS to ON.
- Add the RND option with AMA to the line.
- Add the ARR option to the line (if you want call type-specific records).
- Set the ENABLED field of the RND tuple to Y in table RESOFC.
- The subscriber activates RND on the line.
- Schedule the CIDSUSPAUD entry in table AMAOPTS.

The following example AMA billing record combinations for RND, ARR, CND, ACR, and CNAMD are described in this section:

- RND only
- RND and ARR
- RND and CND
- RND/ARR and CND
- RND and CND/ACR
- RND and CND/CNAMD
- RND/ARR and CND/ACR
- RND/ARR, CND, and CNAMD

RND only

The figure that follows is an example of an AMA record generated for call code 264 for RND alone.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Call code 264-RND only

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:507C AVAIL
ALL COUNT:00012C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00023C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C
```

RND and ARR

The figure that follows is an example of an AMA record generated for call code 264 for RND and ARR.

Call code 264-RND and ARR

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:071C BEARER
CAPABILITY:101C NETWORK INTERWORKING:0C RELEASE CAUSE
INDICATOR:00016C MODULE CODE:507C AVAIL ALL COUNT:00012C
AVAIL BBG COUNT:00000C AVAIL INTERCOM COUNT:00000C
UNAVAIL ALL COUNT:00023C UNAVAIL BBG COUNT:00000C
UNAVAIL INTERCOM COUNT:00000C MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC
MODULE CODE:071C BEARER CAPABILITY:203C NETWORK
INTERWORKING:0C RELEASE CAUSE INDICATOR:00016C MODULE
CODE:507C AVAIL ALL COUNT:00034C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00045C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C
```

RND and CND

The figure that follows is an example of an AMA record generated for call code 264 for RND and CND.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Call code 264-RND and CND

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:17747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:507C
AVAIL ALL COUNT:00012C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00023C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C
```

RND/ARR and CND

The figure that follows is an example of an AMA record generated for call code 264 for RND/ARR and CND.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Call code 264-RND/ARR and CND

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:071C
BEARER CAPABILITY:101C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:507C AVAIL ALL
COUNT:00012C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00023C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:071C
BEARER CAPABILITY:203C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:507C AVAIL ALL
COUNT:00034C AVAIL BBG COUNT:00000C AVAIL INTERCOM
COUNT:00000C UNAVAIL ALL COUNT:00045C UNAVAIL BBG
COUNT:00000C UNAVAIL INTERCOM COUNT:00000C MODULE
CODE:000C
```

RND and CND/ACR

The figure that follows is an example of an AMA record generated for call code 264 for RND and CND/ACR.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Call code 264-RND and CND/ACR

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C MODULE CODE:071C
BEARER CAPABILITY:101C NETWORK INTERWORKING:0C
RELEASE CAUSE INDICATOR:00016C MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C MODULE CODE:071C
BEARER CAPABILITY:203C NETWORK INTERWORKING:0C
RELEASE CAUSE INDICATOR:00016C MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:507C
AVAIL ALL COUNT:00012C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00023C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C
```

RND and CND/CNAMD

The figure that follows is an example of an AMA record generated for call code 264 for RND, CND, and CNAMD. CND and CNAMD have a joint record.

The office parameter ISDNBRI_CNAMD_CND_ONE_AMA in table ISDNVAR controls the CND/CNAMD joint record.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Call code 264-RND and joint CND/CNAMD record

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C MODULE CODE:049C
AVAIL COUNT:00012C UNAVAIL COUNT:00023C MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:507C
AVAIL ALL COUNT:00012C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00023C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C
```

RND/ARR and CND/ACR

The figure that follows is an example of an AMA record generated for call code 264 for RND/ARR and CND/ACR.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Call code 264-RND/ARR and CND/ACR

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C MODULE CODE:071C BEARER
CAPABILITY:101C NETWORK INTERWORKING:0C RELEASE CAUSE
INDICATOR:00016C MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C MODULE CODE:071C BEARER
CAPABILITY:203C NETWORK INTERWORKING:0C RELEASE CAUSE
INDICATOR:00016C MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:071C
BEARER CAPABILITY:101C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:507C AVAIL ALL
COUNT:00012C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00023C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:071C
BEARER CAPABILITY:203C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:507C AVAIL ALL
COUNT:00034C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00045C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C
```

RND/ARR, CND, and CNAMD

The figure that follows is an example of an AMA record generated for call code 264 for RND/ARR, CND, and CNAMD. CND and CNAMD have separate records.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Call code 264-RND/ARR and separate CND/CNAMD records

```
HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:082C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:00012C UNAVAIL COUNT:00023C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:071C
BEARER CAPABILITY:101C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:507C AVAIL ALL
COUNT:00012C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00023C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C

HEX ID:AA STRUCTURE CODE:00110C CALL CODE:264C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C CLASS FEATURE:080C DATE:81116C CONNECT
TIME:1747558C NPA:613C DIR NUMBER:7235203C AVAIL
COUNT:FFFFFC UNAVAIL COUNT:FFFFFC MODULE CODE:071C
BEARER CAPABILITY:203C NETWORK INTERWORKING:0C RELEASE
CAUSE INDICATOR:00016C MODULE CODE:507C AVAIL ALL
COUNT:00034C AVAIL BBG COUNT:00000C
AVAIL INTERCOM COUNT:00000C UNAVAIL ALL COUNT:00045C
UNAVAIL BBG COUNT:00000C UNAVAIL INTERCOM COUNT:00000C
MODULE CODE:000C
```

Station Message Detail Recording

Redirecting Number and Reason Delivery for ISDN CFW does not require Station Message Detail Recording.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Of ce parameter s used by RND

The table that follows lists the office parameters used by Redirecting Number and Reason Delivery for ISDN CFW. For additional information about office parameters, refer to the *Office Parameters Reference Manual*.

Of ce parameter s used by Redirecting Number and Reason Delivery for ISDN CFW

Table name	Parameter name	Explanation and action
OFCENG	KSET_INTER_ GRP_DISP	This office parameter overrides the value of field RNIDOPT in table CUSTNTWK. For displays to work according to datafill in subfield RNIDOPT, set KSET_INTER_GRP_DISP to N. When you set KSET_INTER_GRP_DISP to Y, all redirecting numbers are available to the terminator. This parameter determines if calls that arrive from outside the customer group display information on the display set of the terminator.

Data ll sequence

The table that follows lists the tables that require datafill to put Redirecting Number and Reason Delivery for ISDN CFW into operation. You must enter data into the tables in this order.

Data ll requirements f or Redirecting Number and Reason Delivery for ISDN CFW (Sheet 1 of 2)

Table	Purpose of table
OFCENG	Table OFCENG contains data on engineering parameters for the office. Refer to “Datafilling office parameters" for how this feature affects office parameters.
RESOFC	Table RESOFC enables line option RND. Set field ENABLED to Y for RND to function when it is assigned to a DN. Enter SUBSCR in subfield ACCESS, field FEATDATA for subscription access.
CUSTSTN	Table CUSTSTN lists the station options assigned to each customer group. Add the RND option to the customer group to assign it to an entire business group. Enter RND in field OPTNAME and field OPTION.
RESFEAT(Note)	Table RESFEAT contains the assignment of custom local area signaling services (CLASS) features for residential lines, many of which apply to ISDN lines as well. SERVORD updates this table with option RND.
AMAOPTS	Table AMAOPTS controls the activation and scheduling of the recording options for automatic message accounting (AMA). Table AMAOPTS contains one tuple for every option, and initially contains the default values for each of these options. Enter SUSP in field OPTION to bill for usage.
Note: SERVORD automatically enters data into this table. Refer to “SERVORD" for an example of using SERVORD to enter data into this table.	

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Data ll requirements f or Redirecting Number and Reason Delivery for ISDN CFW (Sheet 2 of 2)

Table	Purpose of table
IBNXLA	Table IBNXLA stores the data for the digit translation of calls. This table stores the access codes for features that require them. Option RND uses the CNDA and CNDD activation codes.
KSETLINE(Note)	Table KSETLINE contains a tuple for each DN on a set indicating what features exist on the DN. SERVORD updates this table with option ARR.
CUSTNTWK	Table CUSTNTWK allows the operating company to assign or deny calling features to customer groups. Option RNID controls whether number delivery is available for all BRI lines in the customer group. Enter RNID in field OPTIONS of the terminator's customer group tuple and a value of INTRAGRP, ONNET, or OFFNET in subfield RNIDOPT. This value, compared to the network of the call, determines the RN's availability.
Note: SERVORD automatically enters data into this table. Refer to “SERVORD" for an example of using SERVORD to enter data into this table.	

Data ll related to RND f or table RESOFC

The table that follows provides the datafill related to Redirecting Number and Reason Delivery for ISDN CFW for table RESOFC. This table includes only those fields that apply directly to RND.

Data ll related to tab le RESOFC (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
KEY		see subfield	Key. This field consists of subfield FEATNAME.
	FEATNAME	RND	Class feature name. This field is the key to the table. Enter RND.
ENABLED		Y or N	Enabled. Enter Y (yes) to specify that the feature is enabled within the office. Enter N (no) to indicate the feature deactivation.
FEATDATA		see subfield	Feature data. This field consists of subfield FEATNAME.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Data ll related to tab le RESOFC (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	FEATNAME	RND	Class feature name. Enter RND.
	ACCESS	SUBSCR	Feature access. This field determines who can access the feature. Enter SUBSCR for subscribers only. Enter UNIVER for all residential (RES) line access to the feature. Enter SUBSCR for RND. Universal access does not apply to RND.

Data ll e xample for table RESOFC

The figure that follows shows sample datafill for table RESOFC.

MAP example for table RESOFC

```
KEY     ENABLED      FEATDATA          FNALANN
_____________________________________________________
RND        N          RND    SUBSCR       $
```

Data ll related to RND f or table CUSTSTN

The table that follows provides the datafill related to Redirecting Number and Reason Delivery for ISDN CFW for table CUSTSTN. This table includes only those fields that apply directly to RND.

Data ll related to tab le CUSTSTN (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
CUSTNAME		alphanumeric (1 to 16 characters)	Customer group name. Enter the customer group name.
OPTNAME		RND	Option name. Enter the name assigned to the option, RND.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Data ll related to tab le CUSTSTN (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
OPTION		see subfield	Option. This field consists of subfield OPTION.
	OPTION	RND	Option. Enter the name assigned to the option, RND.

Data ll e xample for table CUSTSTN

The figure that follows shows sample datafill for table CUSTSTN.

MAP example for table CUSTSTN

```
CUSTNAME     OPTNAME      OPTION
_____________________________________________________________
ISDNGRP       RND          RND
```

Data ll related to RND f or table AMAOPTS

The table that follows provides the datafill related to Redirecting Number and Reason Delivery for ISDN CFW for table AMAOPTS. This table includes only those fields that apply directly to RND.

Data ll related to tab le AMAOPTS (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
OPTION		see subfield	Option. This field consists of subfield AMAOPT.
	AMAOPT	CIDSUSPAUD, SUSP	AMA option. Enter one of the option values.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Data ll related to tab le AMAOPTS (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
SCHEDULE		see subfield	Schedule. This field consists of subfield AMASEL, ONDATE, OFFDATE, SCHED, ONTIME and OFFTIME.
	AMASEL	ON, OFF, DEFAULT, PERIODIC, TIMED	AMA selector. Enter one of the following values: • ON: Activate the option immediately. • OFF: Deactivate the option immediately. • DEFAULT: Use the default schedule for the option. The value DEFAULT never appears in table AMAOPTS, since table control replaces it with the actual default value. The DEFAULT selector can be used at any time and the switch recalculates the default value if the default AMASEL value is PERIODIC. • PERIODIC: Activate the option at the specified date and time and perform the activity periodically at the interval specified. Datafill subfields ONDATE and ONTIME to specify the date and time for activation, and datafill SCHED for the time intervals at which to perform the activity. For PERIODIC refinements, refer to AMASEL=PERIODIC conditional datafill table. • TIMED: Activate the option between the specified dates and times. Datafill refinements ONDATE and ONTIME to activate the option, and refinements OFFDATE and OFFTIME to deactivate the option. For TIMED refinements, refer to AMASEL=TIMED conditional datafill table.

Data ll e xample for table AMAOPTS

The figure that follows shows sample datafill for table AMAOPTS.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

MAP example for table AMAOPTS

```
OPTION                          SCHEDULE
-------------------------------------------------------
CIDSUSPAUD                    PERIODIC 980806 0000 24HRS
SUSP                           ON
```

Data ll related to RND f or table IBNXLA

The table that follows provides the datafill related to Redirecting Number and Reason Delivery for ISDN CFW for table IBNXLA. This table includes only those fields that apply directly to RND.

Data ll related to tab le IBNXLA (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
KEY		see subfields	Key. This field consists of subfields XLANAME and DGLIDX.
	XLANAME	alphanumeric (1 to 8 characters)	Translator name. Enter the name that is assigned to the translator.
	DGLIDX	vector of up to 18 digits	Digilator index. Enter the digit or digits assigned as an ambiguous code. The range of this field depends on field MAXDIG in table XLANAME. The DGLIDX can accept overdecadic digits. The allowable values for the digilator portion of DGLIDX of table IBNXLA are as follows: 9 digits 0 to 9 C digits 0 to 9 and B to C F digits 0 to 9 and B to F The allowable digit range for table IBNXLA digilator values is determined for each translator.
RESULT		see subfields	Result. This field consists of subfield TRSEL, ACR, SMDR, and FEATURE.
	TRSEL	FEAT	Translator selector. Enter the translation selector FEAT.
	ACR	Y or N	Account code entry. Enter Y (yes) if an account code entry is required for all calls to the special feature access code. Enter N (no) when the feature is equal to SCPL or SCPS (see field FEATURE).

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Data ll related to tab le IBNXLA (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	SMDR	Y or N	Station Message Detail Recording. Enter Y if all calls from a customer group station or attendant console to any station in the block of station numbers are recorded. Enter N if no recording is required. ***Note:*** If field SMDR is set to Y, only the feature that originates a call is SMDR recorded. This field has no effect and no SMDR record is produced for features that do not originate calls. For dump and restore purposes, an N must be datafilled after the SMDR field if field TRSEL is datafilled with NET, ROUTE, TTTR, AMBI, EXTN, CUTTD, or FEAT. The Station Message Detail Recording fields SMDR and SMDRB [TRKSEL=NET] can only be set to Y if the switching unit has the option SMDR_OFFICE set to Y in table OFCOPT. SMDR bills each leg of the call. The option must be turned on in IBN translations to generate SMDR billing. Turning on the option for one leg of the call does not carry over to another leg of the call. Virtual facility groups (VFG) for routing SMDR must be turned on for the leg of the call that requires billing and must be routed through IBN translations. Neither SMDR nor SMDRB can be turned on for calls from plain ordinary telephone service (POTS) VFGs.
	FEATURE	CNDA, CNDD	Feature. Enter CNDA for Calling Name/Number Delivery SUSP activation. This code is also used for ISDN Redirecting Number Delivery SUSP.

Data ll e xample for table IBNXLA

The figure that follows shows sample datafill for table IBNXLA.

MAP example for table IBNXLA

```
KEY                          RESULT
-----------------------------------------------
ISDNXLA       50               FEAT   N N    CNDA
ISDNXLA       51               FEAT   N N    CNDD
```

Redirecting Number and Reason Delivery for ISDN CFW (continued)

Data ll related to RND f or table CUSTNTWK

The table that follows provides the datafill related to Redirecting Number and Reason Delivery for ISDN CFW for table CUSTNTWK. This table includes only those fields that apply directly to RND.

Data ll related to tab le CUSTNTWK

Field	Subfield	Entry	Explanation and action
OPTIONS		see subfields (up to 13 multiples)	Options. This field consists of subfield OPTION and refinements.
	OPTION	RNID	Option. This subfield lists options assigned to the customer group. Option RNID controls whether number delivery is available for all BRI lines in the customer group.
	RNIDOPT	INTRAGRP, ONNET, or OFFNET	RNID option. Enter INTRAGRP to indicate option RNID is available only to terminating agents in the same customer group as the originating agent. Enter ONNET to indicate option RNID is enabled on calls originating in the same network as option RNID that is associated with the called party. Enter OFFNET to indicate option RNID is enabled on all networked calls, regardless of their origin. ***Note:*** Office parameter KSET_INTER_GRP_DISP of table OFCENG overrides the value of field RNIDOPT. For displays to work according to datafill in subfield RNIDOPT, set KSET_INTER_GRP_DISP to N. When you set KSET_INTER_GRP_DISP to Y, all redirecting numbers are available to the terminator, unless the call comes in on an IT ISUP or ATC ISUP trunk.

Data ll e xample for table CUSTNTWK

The figure that follows shows sample datafill for table CUSTNTWK.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

MAP example for table CUSTNTWK

```
CUSTNAME    NETNAME      NETCGID     DNREVXLA     OPTIONS
_____________________________________________________________
ISDNGRP PRIVATE 10 (PUBLIC ISDNGRP_DDN 10) (PRIVATE
ISDNGRP_DDN 10) $ (NTWKRAG 30 5 3 12 3 5 OFFNET) (CLID
OFFNET) (RNID OFFNET) $
```

Translation veri cation tools

Redirecting Number and Reason Delivery for ISDN CFW does not use translation verification tools.

SERVORD

Use SERVORD to add options RND and ARR to a line with the NEW, EST, ADO, or ADD commands. Use the CHF command to change the billing option, and the DEO or OUT command to delete the options. SERVORD automatically updates table RESFEAT when you modify option RND.

SERVORD automatically updates table KSETLINE when you modify option ARR. SERVORD option ARR (like ACR for CND) pegs fields AVAILDLY and UNAVAILDLY for the VI call type, and fields CMDAVAILDLY and CMDUNAVAILDLY for the CMD call type in table RESFEAT.

SERVORD limitations and restrictions

The SERVORD limitations and restrictions that follow apply to Redirecting Number and Reason Delivery for ISDN CFW:

- Option ARR requires option RND. Add option ARR to a line that already has option RND assigned. You can add option ARR to a line when you add option RND.
- If you remove option RND from a line, you also remove ARR.
- Option RND is incompatible with the following SERVORD options: AVT, BLOCKCGN, BNN, CCSA, DCND, LDTPSAP, PCWT, PREMTBL, and 3WCPUB.
- Option RND SUSP is incompatible with options DOR and AUL.
- You cannot add option RND to a secondary member of a MADN group—either SCA or CACH.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

SERVORD prompts

The table that follows provides the SERVORD prompts used to add Redirecting Number and Reason Delivery for ISDN CFW to a DN.

SERVORD prompts for Redirecting Number and Reason Delivery for ISDN CFW

Prompt	Correct input	Explanation
OPTION	ARR, RND	Describes the option related to the service you want to establish, modify, or delete
BILLING_OPTION:NOAMA	AMA, NOAMA	Describes the billing option, if required, when adding or modifying the RND option

SERVORD example to add Redirecting Number and Reason Delivery for ISDN CFW

The SERVORD example that follows shows how to add Redirecting Number and Reason Delivery for ISDN CFW (both options RND and ARR) to a DN with the NEW command in prompt mode.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

SERVORD example for Redirecting Number and Reason Delivery for ISDN CFW in prompt mode

```
>NEW
SONUMBER:  NOW 96 10 31 PM
>
DN:
> 6755000
LCC:
> ISDNKSET
GROUP:
> ISDNGRP
SUBGRP:
> 0
SNPA:
> 619
KEY:
> 1
RINGING:
>Y
LATANAME:
> LATA1
LTG:0
>
LEN_OR_LTID:
> ISDN 20
OPTKEY:
> 1
OPTION:
> RND
BILLING_OPTION:NOAMA
>AMA
OPTKEY:
>1
OPTION:
>ARR
OPTKEY:
>$
```

The SERVORD example that follows shows how to add Redirecting Number and Reason Delivery for ISDN CFW to a DN with the NEW command in no-prompt mode.

Redirecting Number and Reason Delivery for ISDN CFW (continued)

SERVORD example for Redirecting Number and Reason Delivery for ISDN CFW in no-prompt mode

```
> NEW NOW 96 10 31 PM 6755000 ISDNKSET ISDNGRP 0 0 619 1 Y 0
ISDN 20 (1 RND AMA) (1 ARR) $
```

SERVORD example to add Redirecting Number and Reason Delivery for ISDN CFW

The SERVORD example that follows shows how to add Redirecting Number and Reason Delivery for ISDN CFW (RND only) to a DN with the ADO command in prompt mode.

SERVORD example for Redirecting Number and Reason Delivery for ISDN CFW in prompt mode

```
>ADO
SONUMBER:  NOW 96 10 31 PM
>
DN_OR_LEN:
> ISDN 20
OPTKEY:
> 2
OPTION:
> RND
BILLING_OPTION:NOAMA
> AMA
OPTKEY:
> $
```

The SERVORD example that follows shows how to add Redirecting Number and Reason Delivery for ISDN CFW to a DN with the NEW command in no-prompt mode.

SERVORD example for Redirecting Number and Reason Delivery for ISDN CFW in no-prompt mode

```
> ADO  NOW 96 10 31 PM ISDN 20 (2 RND AMA) $
```

SERVORD example to add Redirecting Number and Reason Delivery for ISDN CFW

The SERVORD example that follows shows how to add Redirecting Number and Reason Delivery for ISDN CFW to a secondary DN with the ADO

Redirecting Number and Reason Delivery for ISDN CFW (end)

command in prompt mode. The AMA prompt does not appear because SUSP is OFF in table AMAOPTS.

SERVORD example for Redirecting Number and Reason Delivery for ISDN CFW in prompt mode

```
>ADO
SONUMBER: NOW 96 10 31 PM
>
DN_OR_LEN:
> ISDN 20
OPTKEY:
> 2
OPTION:
> RND
OPTKEY:
> $
```

The SERVORD example that follows shows how to add Redirecting Number and Reason Delivery for ISDN CFW to a secondary DN with the ADO command in no-prompt mode.

SERVORD example for Redirecting Number and Reason Delivery for ISDN CFW in no-prompt mode

```
> ADO NOW 96 10 31 PM ISDN 20 (2 RND) $
```

Redirecting Number Privacy for ISDN Call Forward

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: does not apply

Release applicability

NA012 and up

NA012 introduced Redirecting Number Privacy for ISDN Call Forward.

Requirements

Redirecting Number Privacy for ISDN Call Forward has no functional group requirements.

Description

Redirecting Number Privacy (RNP) for ISDN Call Forward provides control over delivery or suppression of the redirecting number (RN) for forwarded calls. The delivery or suppression of the RN is the presentation, or privacy, status. This feature creates the Service Order System (SERVORD) line option SUPPRND, which allows the DN to control its presentation status. You can provision RNP on a DN basis as a line option for all call types, but not at the customer group or network level.

This feature improves Redirecting Number and Reason Delivery (RND) for ISDN CFW, AF7736, which created RND for ISDN BRI lines in NA011. This feature improves RND by providing DN level control over RND with the SUPPRND option on the redirector's DN. The NA011 feature provided control of RN delivery by the existing Calling Number Delivery (CND) SUPPRESS option. Now you can have different presentation status values for the redirecting DN and the calling DN.

See the feature description “Redirecting Number and Reason Delivery for ISDN CFW" in this document for details on the RND feature, which is a prerequisite.

Operation

This section describes these aspects of RNP: RNP presentation indicator status, SUPPRND option, and QLT and QDN displays.

RNP indicator

The privacy status encoded in the Q.931 SETUP message and the ISDN User Part (ISUP) initial address message (IAM) carries the correct RNP status of

Redirecting Number Privacy for ISDN Call Forward (continued)

"Allowed" or "Restricted" based on the type of redirection. When a call redirects as a result of a busy, unconditional, or no-answer redirection, the RNP indicator is checked on the DN.

SUPPRND option

The SUPPRND option is a DN feature, which you can assign to a primary or secondary DN. Assign the option on a network basis, and use the network names from table NETNAMES.

The SUPPRND option controls the presentation status (delivery or suppression) of the DN that redirects for unconditional, busy, and no-answer redirections. SERVORD option SUPPRND on the redirector's DN determines when to deliver or suppress the DN. SERVORD updates table DNATTRS with the SUPPRND values.

Unconditional, busy, and no-answer

The three values for suppress RND address the three types of redirections: unconditional, busy, and no answer. You must assign a value for each type, once you assign SUPPRND. The unconditional SUPPRND value is for redirections caused by call forward universal (CFU), call forward intragroup (CFI), and call forward fixed (CFF). For line redirections, the busy SUPPRND value is for redirections caused by call forward busy (CFB). For line redirections, the no-answer SUPPRND value is for redirections caused by call forward no answer (CFD).

For trunk redirections, the busy value is for redirections caused by line overflow to DN (LOD), line overflow to route (LOR), and key short hunt (KSH) overflow, as well as CFB.

When an ISDN set with the SUPPRND option redirects a call, its DN presentation status is determined by two factors: the type of redirection, and the SUPPRND value matching the type of redirection. For example, if a call redirects due to CFB and the DN has SUPPRND_BUSY=Y, the redirecting DN does not display on the terminator's set.

> ***Note:*** The Calling Number Delivery (CND) SUPPRESS option, on the terminator's DN, determines the RN presentation status in absence of the SUPPRND option on the redirector. If the set does not have SUPPRESS, the default is to deliver the DN. Option SUPPRND takes precedence over option SUPPRESS.

SERVORD commands

Add this option to a new DN with the NEW command, or to an existing primary or secondary DN with the ADO command. Remove the option with the OUT and DEO commands. Use the CHF command to change the

SUPPRND values once a DN has this option. Use the DEL command to delete this option from a directory number hunt (DNH) group. You cannot use the EST or the ADD commands to add this option to a hunt group.

See the “SERVORD" section in this feature description for more information on SERVORD commands used with option SUPPRND.

QLT and QDN display

If you assign option SUPPRND to the primary DN (key 1 DN), SUPPRND displays when you issue the QLT or QDN command. If you assign SUPPRND to a secondary DN (key 2 or higher), QLT and QDN do not display the option. All members of multiple appearance directory number (MADN) call appearance call handling (CACH) and single call arrangement (SCA) groups, multiline hunt (MLH) and distributed line hunt (DLH) groups, and shared DNs display the option if you assign it to the MADN, hunt, or shared DN.

QLT command display example

```
>QLT
LTID: NI2          1
SNPA: 613
DIRECTORY NUMBER:    7234201
LT GROUP NO: 15
LTCLASS: BRAFS   DEFAULT LOGICAL TERMINAL:N
EKTS:N  CACH:N
SLBRI:N
CS:NI2 PS:N
ELN:N
VERSION: FUNCTIONAL  ISSUE:2
TSPID:      6137234201
LEN: HOST 01 0 00 04    TEI:DYNAMIC
CUSTGRP:    BNR   SUBGRP:0 NCOS:0 RING: Y
LINE CLASS CODE:ISDNKSET
MAXKEYS:64
OPTIONS:
SFC SUPPRESS PRIVATE Y Y SUPPRND PUBLIC N N Y PRIVATE Y
Y N SMOH VI $ $ N CMD BOTH $ $ N
AR NOAMA $ DCC CRBL 3 3 NDNAP 6 ACB NOAMA $ TRANSFER EXP
CTALL DROP FC 3 AFC 5
```

Translations table o w

The table that follows shows the Redirecting Number Privacy for ISDN Call Forward translations.

Table DNATTRS contains attributes for DNs. The key is the DN, which the numbering plan area, office code, and station code describe. DN attributes

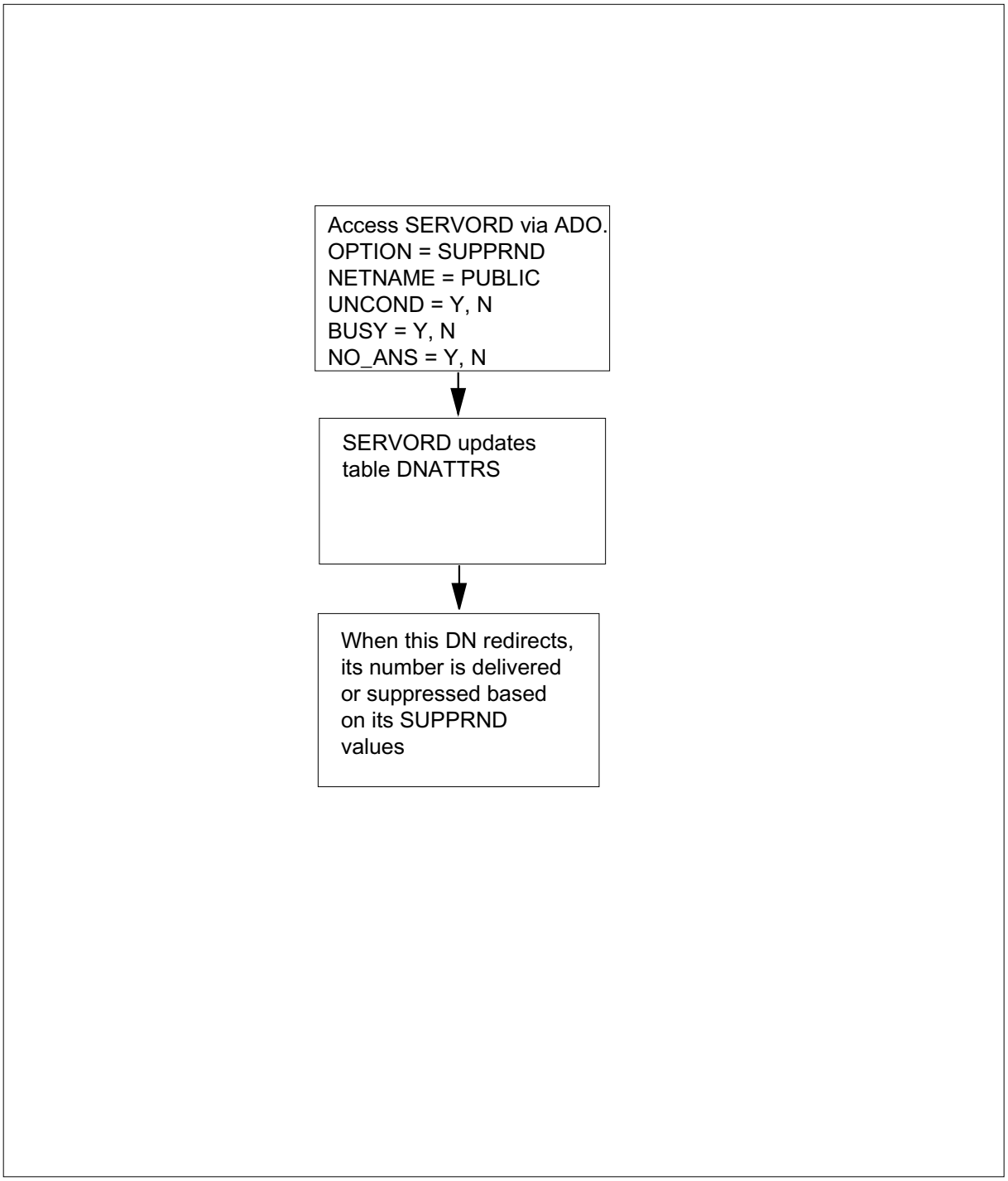
Redirecting Number Privacy for ISDN Call Forward (continued)

exist for up to two logical networks. SERVORD automatically updates this table with SUPPRND values when you assign it to a DN in SERVORD.

The flowchart that follows provides the Redirecting Number Privacy for ISDN Call Forward translations process.

Redirecting Number Privacy for ISDN Call Forward (continued)

Table o w for Redirecting Number Privacy for ISDN Call Forward



Redirecting Number Privacy for ISDN Call Forward (continued)

The table that follows lists the datafill content used in the flowchart.

Data ll e xample for Redirecting Number Privacy for ISDN Call Forward

Datafill table	Example data
DNATTRS	613 723 4201 (PUBLIC (SUPPRND N N Y) $)(PRIVATE (SUPPRESS N Y) (SUPPRND Y Y N) $) $(BC (SPEECH NILC N $) (3_1_KHZ NILC N $) (56KDATA NILC N $)(64KDATA NILC N $) $) $

Limitations and restrictions

The limitations and restrictions that follow apply to Redirecting Number Privacy for ISDN Call Forward:

- Option SUPPRND applies to PVC Functional Issue 2 terminals only.
- For trunk redirections, if the second or higher redirection is to a primary rate interface (PRI) trunk, then party C's DN never presents. For example, party A redirects to B, who redirects to C, which is a PRI trunk, which redirects to D. If party C has SUPPRND N N N (which means never suppress), party D does not receive its DN, due to a PRI restriction.

Interactions

The paragraphs that follow describe how Redirecting Number Privacy for ISDN Call Forward interacts with other functionalities.

AIN

Option SUPPRND and option SUPPRESS do not work with AIN redirections. AIN redirections do not follow the SUPPRND presentation status of the redirecting DN.

Calling Number Delivery

If you do not assign SUPPRND to the DN, the SUPPRESS option determines the RND presentation status.

Activation and deactivation by the user

Redirecting Number Privacy for ISDN Call Forward does not require activation or deactivation by the user.

Billing

Redirecting Number Privacy for ISDN Call Forward does not generate changes to billing records. See the feature description “Redirecting Number and Reason Delivery for ISDN CFW" in this document for billing information.

Station Message Detail Recording

Redirecting Number Privacy for ISDN Call Forward does not require Station Message Detail Recording.

Of ce parameters used by Redirecting Number Privacy for ISDN Call Forward

Redirecting Number Privacy for ISDN Call Forward does not generate office parameters.

Data ll sequence

The table that follows lists the table that requires datafill to put Redirecting Number Privacy for ISDN Call Forward into operation.

Data ll requirements f or Redirecting Number Privacy for ISDN Call Forward

Table	Purpose of table
DNATTRS	Directory Number Attributes contains attributes for DNs. The key is the DN, which the numbering plan area, office code, and station code describe. DN attributes exist for up to two logical networks. SERVORD automatically updates this table with SUPPRND values, so no datafill section follows.

Translation veri cation tools

Redirecting Number Privacy for ISDN Call Forward does not use translation verification tools.

SERVORD

The SUPPRND option controls the presentation status of the redirecting DN for unconditional, busy, and no-answer redirections. SERVORD option SUPPRND on the redirecting DN determines when to deliver or suppress the DN.

You can add this option to the following DNs with the ADO command:

- an existing primary or secondary DN
- a pilot of a multiline hunt (MLH) group
- a pilot of a distributed line hunt (DLH) group
- a pilot or a member of a KSH group
- a pilot or a member of a DNH group
- a MADN CACH controller
- a MADN SCA primary member

Redirecting Number Privacy for ISDN Call Forward (continued)

- a voice band information (VI) or circuit-mode data (CMD) call appearance of a single DN
- a VI or CMD call appearance of a shared DN

Add this option to a new DN with the NEW command. Remove this option with the OUT and DEO commands. Use the CHF command to change the SUPPRND values after you add this option to a DN. Use the DEL command to delete this option from a DNH member.

SERVORD limitations and restrictions

The SERVORD limitations and restrictions that follow apply to Redirecting Number Privacy for ISDN Call Forward:

- You can assign this option to an ISDN pilot of a hunt group only. If the pilot has this option, the hunt group DN does not display when the pilot redirects a call (if SUPPRND is Y for the redirection type). If you remove the pilot from the group, SERVORD removes this option from the correct hunt group DN tuple in table DNATTRS.
- You can assign this option to the ISDN primary member of a MADN group. When the controller has this option, the MADN group DN does not display when the primary member redirects a call (if SUPPRND is Y for the redirection type). If you remove the primary member from the group, SERVORD removes this option from the correct MADN group tuple in table DNATTRS.
- This option applies to all call appearances of a shared DN. You must first remove all DN call appearances before SERVORD removes this option and updates table DNATTRS. You can use the DEO command to remove the option.
- This option applies to both DN appearances of a single DN. SUPPRND applies to both DN appearances of a single DN with two call appearances (one VI and one CMD). Remove the DN with the SERVORD OUT command to remove this option from table DNATTRS. You can use the DEO command to remove the option.
- You cannot add this option to an Additional Functional Call (AFC) key.
- You cannot use the EST or the ADD commands to add this option to a hunt group.
- You cannot use the CHF command to change this option on a non-pilot member of a MADN, MLH, or DLH group on a shared DN. Use the CHF command only on the pilot DN, which has this option, to change the SUPPRND values.

Redirecting Number Privacy for ISDN Call Forward (continued)

- You cannot use the DEO command to delete this option from a non-pilot member of a MADN, MLH, or DLH group on a shared DN. Use the DEO command only on the pilot DN, which has this option, to delete it.
- The DEL command, when used to remove an MLH or DLH group member, does not remove this option from the hunt DN.

SERVORD prompts

The table that follows provides the SERVORD prompts used to add Redirecting Number Privacy for ISDN Call Forward to a DN.

SERVORD prompts for Redirecting Number Privacy for ISDN Call Forward

Prompt	Correct input	Explanation
OPTION	SUPPRND	The Suppress RND option, which controls the presentation status of the redirecting DN for unconditional, busy, and no-answer redirections
NETNAME	alphanumeric (up to 32 characters)	The logical network name, which must be in table NETNAMES
SUPPRND_ UNCOND	Y or N	The suppression value for unconditional redirections, which CFU, CFF, and CFI cause. A value of Y means suppress the redirecting DN for unconditional redirections; N means do not suppress.
SUPPRND_BUSY	Y or N	The suppression value for busy redirections, which CFB causes for lines; or which CFB, LOD, LOR, and KSH overflow cause for trunks. A value of Y means suppress the redirecting DN for busy redirections; N means do not suppress.
SUPPRND_NO_ ANS	Y or N	The suppression value for no-answer redirections, which CFD causes for lines and trunks. A value of Y means suppress the redirecting DN for busy redirections; N means do not suppress.
Note: SERVORD automatically updates table DNATTRS		

SERVORD example to add Redirecting Number Privacy for ISDN Call Forward to a DN

The SERVORD example that follows shows how to add Redirecting Number Privacy for ISDN Call Forward to a DN with the NEW command in prompt mode. In this example, the RN does not deliver for any type of redirection over the private network.

Redirecting Number Privacy for ISDN Call Forward (continued)

SERVORD example for Redirecting Number Privacy for ISDN Call Forward in prompt mode

```
>new
SONUMBER: NOW 96 7 1 PM
>
DN:
> 6755000
LCC:
> isdnkset
GROUP:
> bnr
SUBGRP:
> 0
NCOS:
>0
SNPA:
> 619
KEY:
> 1
RINGING:
> y
LTG:0
>
LEN_OR_LTID:
> isdn 20
OPTKEY:
> 1
OPTION:
> supprnd
NETNAME:
> private
SUPPRND_UNCOND:
> y
SUPPRND_BUSY:
> y
SUPPRND_NO_ANS:
> y
NETNAME:
> $
OPTKEY:
> $
```

The SERVORD example that follows shows how to add Redirecting Number Privacy for ISDN Call Forward to a DN with the NEW command in no-prompt mode.

Redirecting Number Privacy for ISDN Call Forward (end)

SERVORD example for Redirecting Number Privacy for ISDN Call Forward in no-prompt mode

```
> new 6755000 isdnkset bnr 0 0 619 1 y isdn 20 1 supprnd private y y y
$ $
```

Remote Access to ISDN Call Forwarding

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA011 and up

Prerequisites

Complete use of this functionality can require software or hardware not described in this document.

To operate, Remote Access to ISDN Call Forwarding has the following prerequisites:

- BAS Generic, BAS00003
- MDC Minimum, MDC00001
- MDC Standard, MDC00003
- RES Service Enablers, RES00006

Description

This feature makes the remote access to Call Forwarding (CFW) features available on ISDN basic rate interface (BRI) lines. ISDN lines must subscribe to one of the following CFW features before this feature can work:

- Call Forwarding Fixed (CFF)
- Call Forwarding Intragroup (CFI)
- Call Forwarding Universal (CFU)
- CFF, CFI, or CFU as provisioned by option Call Forwarding per Directory Number per Call Type (CFXDNCT) (NI-2 terminals)

Note: CFF, CFI, and CFU are exclusive CFW features. Option CFXDNCT provisions CFF, CFI, or CFU on NI-2 lines only. In this functionality, *NI-2 CFW* refers to NI-2 lines that have CFW sub-features provisioned by option CFXDNCT.

Operation

This feature requires the use of the Service Order System (SERVORD) to set up ISDN lines with remote CFW features. This section describes the use of SERVORD to provision ISDN lines with the remote CFW features.

Remote Access to ISDN Call Forwarding (continued)

Because this feature does not change the functionality of remote CFW features, this section provides brief information about those features. The functionality of remote access to CFW is the same for ISDN as it is for Meridian Digital Centrex (MDC) and Residential Enhanced Services (RES). Within this section, look for references to other documentation that provide more information about functionality and required datafill for the remote CFW features.

SERVORD use

A technician uses SERVORD to provision remote CFW features on ISDN lines. The SERVORD prompts that display for NI-2 lines are different from those that display for pre-NI-2 lines.

NI-2 CFW

Option CFXDNCT provisions NI-2 CFW sub-features through SERVORD. Before this feature, Call Forwarding Remote Access (CFRA) was not a sub-feature of option CFXDNCT. This feature adds CFRA as a sub-feature to option CFXDNCT. A technician can add CFRA to a line only when CFF, CFI, or CFU exists on the line as provisioned by option CFXDNCT. Refer to the feature description “ISDN Redirection Services (CFW)" for more information on how option CFXDNCT provisions CFW sub-features.

Note: For NI-2 CFW, CFRA applies to voice call types only.

Pre-NI-2 CFW

This feature adds CFRA as a SERVORD option to lines with pre-NI-2 CFW. A technician adds CFRA to pre-NI-2 lines that already have CFF, CFI, or CFU assigned through SERVORD.

Functionality for remote access to CFW features

This feature does not change the functionality of remote access to CFW features. The functionality of those features is the same for ISDN as it is for RES. The features of remote access to CFW include

- Call Forwarding Remote Access (CFRA)
- Remote Call Forwarding without Unique Pin, also known as Station Programmable PIN (SPP)

Call Forwarding Remote Access and Remote Call Forwarding without Unique Pin cannot exist on the same load.

CFRA description

CFRA allows end users to program CFW on their Direct Inward System Access (DISA) telephone from a remote set. The remote set can exist on the same or a different switch than the end user's own set. ISDN lines can access

Remote Access to ISDN Call Forwarding (continued)

CFRA using the DISA or the access code defined for the base station customer group.

CFRA requires the use of announcements. Announcements prompt the end user to enter a directory number (DN) and personal identification number (PIN). If the DN and PIN match, more announcements prompt the end user to activate or deactivate CFRA. Announcements can be two types: standard or customized. CFRA uses both standard and customized announcements. The digital recorded announcement machine (DRAM) stores announcements. Also, announcements require datafill in translations tables.

For details about CFRA and the use of announcements, refer to the following information in the RES section of this document:

- “Call Forwarding Remote Activation"
- “Appendix A - Datafilling announcements"

Also, see *Digital Recorded Announcement Machine DRAM and EDRAM Guide, 297-1001-527,* for information about the DRAM Record (DRAMREC) utility and the content of prerecorded phrases.

SPP description

The Remote Call Forwarding without Unique PIN feature allows CFRA personal identification numbers (PIN) to be non-unique. Remote Call Forwarding without Unique PIN also allows end users to change their CFRA PINs from their telephone by dialing a feature access code called an SPP. The use of SPP is optional by customer group. The operating company is responsible for the initial PIN assignment. After the end user changes a PIN, the operating company cannot view it.

Like CFRA, SPP requires the use of announcements. For details about SPP and announcements, refer to the following information in the RES section of this document:

- “Remote Call Forwarding without Unique PIN"
- “Appendix A - Datafilling announcements"

Also, see *Digital Recorded Announcement Machine DRAM and EDRAM Guide, 297-1001-527,* for information about the DRAM Record (DRAMREC) utility and the content of prerecorded phrases.

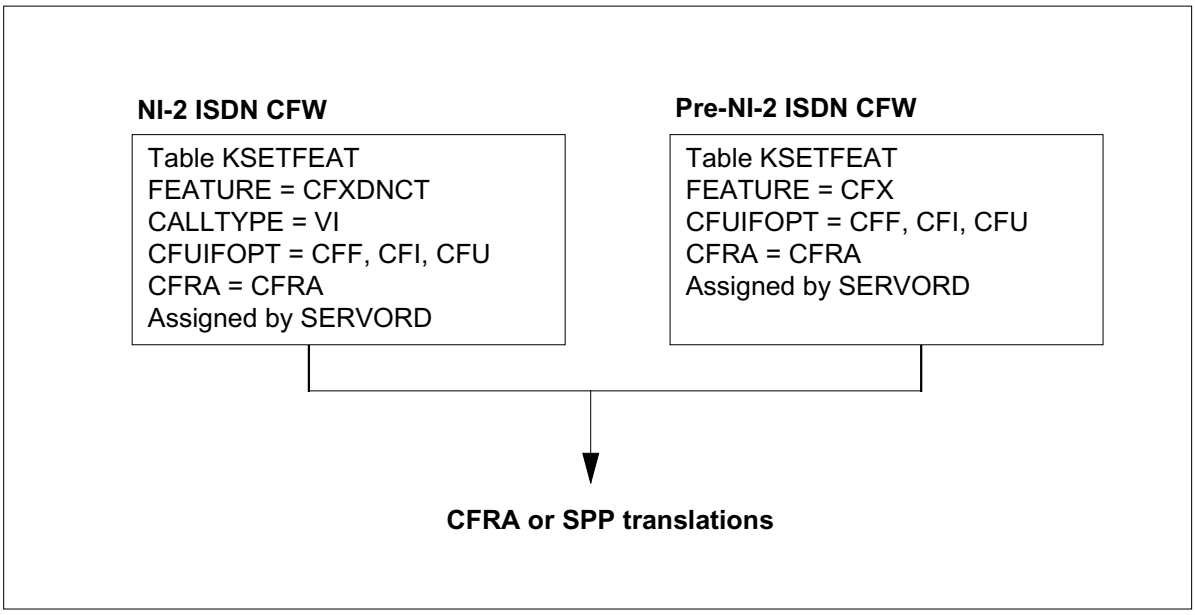
Translations table o w

Remote Access to ISDN Call Forwarding updates table KSETFEAT (Business Set and Data Unit Features). Table KSETFEAT contains the line features assigned to the business sets.

- For NI-2 CFW, SERVORD updates table KSETFEAT when you add sub-feature CFRA (provisioned by option CFXDNCT) to a line. The call type must be voice (VI). Sub-feature CFF, CFI, or CFU (as provisioned by option CFXDNCT) must be present on the line before you can assign CFRA. If CFF, CFI, or CFU is not present, use SERVORD to assign one of these sub-features, and then assign sub-feature CFRA.
- For pre-NI-2 CFW, SERVORD updates table KSETFEAT when you add option CFRA to a line. Option CFF, CFI, or CFU must be present on the line before you can add option CFRA. If CFF, CFI, or CFU is not present, use SERVORD to assign one of these options, and then assign option CFRA.

After updates to table KSETFEAT, translations table flow for CFRA or SPP translations continues. Refer to “Call Forwarding Remote Activation" and “Remote Call Forwarding without Unique PIN" in the RES section of this document for detailed information.

Table o w for Remote Access to ISDN Call Forwarding



Remote Access to ISDN Call Forwarding (continued)

The following table lists the datafill content used in the flowchart. The table shows example datafill for CFRA to NI-2 CFW.

Data ll e xample for KSETFEAT (NI-2 CFW)

Datafill table	Example data
KSETFEAT	ISDN 1 14 CFXDNCT CFXDNCT CFRA N 6 CFB P N N (1,5) VI $ISDN 1 CFXVAL CFXVAL Y $

Limitations and restrictions

For limitations and restrictions related to CFRA and SPP, refer to “Call Forwarding Remote Activation" and “Remote Call Forwarding without Unique PIN" in the RES section of this document.

The following limitations and restrictions apply to Remote Access to ISDN Call Forwarding:

- This feature is available to
  - — NI-1 initializing terminals
  - — 2B non-initializing and initializing terminals
  - — NI-2 non-initializing and initializing terminals
- The ISDN BRI terminal must be NI-1 or NI-2 compliant to support the interworking with announcements.
- CFF, CFI, and CFU are exclusive options and cannot exist on the same line.
- CFRA does not support Call Forwarding Busy (CFB) or Call Forwarding Don't Answer (CFDA).
- CFRA provides remote activation and deactivation for voice call types only.
- The directory number (DN) must have a valid type of call forwarding or CFXDNCT assigned before you can assign CFRA.

Interactions

Additional information about interactions related to CFRA and SPP are in “Call Forwarding Remote Activation" or “Remote Call Forwarding without Unique PIN" in the RES section of this document.

The following paragraphs describe the interactions between Remote Access to ISDN Call Forwarding and other functionalities.

Bridged Night Number (BNN)

CFRA for ISDN CFW is not compatible with BNN.

Call Forwarding Busy (CFB)

CFRA does not support CFB.

Call Forwarding Don't Answer (CFDA)

CFRA does not support CFDA.

Free Number Terminating (FNT)

CFRA for ISDN CFW is not compatible with FNT.

Hotel/Motel (HOT)

CFRA for ISDN CFW is not compatible with HOT.

Operator Number Identi cation (ONI)

CFRA for ISDN CFW is not compatible with ONI.

Terminating Billing Option (TBO)

CFRA for ISDN CFW is not compatible with TBO.

Activation/deactivation by the end user

An end user activates or deactivates CFRA from a remote set. An end user activates SPP at the user's own set. Details about the announcements that the end user responds to are in

- “Call Forwarding Remote Activation" or “Remote Call Forwarding without Unique PIN" in the RES section of this document
- “Appendix A - Datafilling announcements" in the RES section of this document

Activation of CFRA by the end user

Note: If you go on-hook or receive a treatment that indicates the activation failed, the CFRA status of your set does not change. If you try to use CFRA to activate CFW on a set that is already call forwarded, CFRA functions as if CFW were not active.

From a remote set

1. Go off-hook.

   Response:

   Dial tone

2. Enter a DISA DN to the office serving the CFRA subscriber set.

Remote Access to ISDN Call Forwarding (continued)

Response:

“Please enter the N-digit telephone number to forward, followed by your PIN number."

If hardware resources are not available to process the call, you receive no service circuit (NOSC) treatment and must try the call again. If software resources are not available to process the call, you receive no software resources (NOSR) treatment and must try the call again.

3. Enter the DN of the subscriber set that is being call forwarded, a PIN, and #.

   Response:

   “Please enter a code to activate or deactivate call forwarding." This request asks you to dial the standard call forward activation code for CFU, CFI, or CFF.

   If you do not enter the correct DN or PIN, you receive the previous announcement again. If you do not enter the correct DN or PIN beyond the last allowed try, you receive negative acknowledgment (NACK) treatment.

4. Enter the activation code.

   Response is one of the following:

   - If the set being call forwarded has CFF assigned, you receive a confirmation tone. The confirmation tone indicates CFF has been

successfully activated. You have now completed the steps to activate CFRA from a remote set.

- If the set being call forwarded has CFI or CFU assigned, you receive the announcement “Calls to your number will be forwarded to another number. Please enter the number now." Go to the next step.

5. Enter the DN to indicate where calls will be forwarded.

   Response:

   “Calls to your telephone will be forwarded to nnn nnnn. To confirm this, press 1; to forward to a different number, press 2; to cancel this, please hang up now."

   If you dial 1, you receive a confirmation tone. CFRA activation is complete. If you dial 2, you receive a message that asks you to dial the DN to which calls are to be forwarded.

   If you dial a number different from 1 or 2, and you exceed the number of allowed retries, you receive NACK treatment.

   If you go on-hook (with or without dialing another number), you cancel CFRA activation. Also, the status of the set does not change.

   If the DN you enter fails screening, you receive the announcement: “Your calls cannot be forwarded to nnn nnnn. Please enter another number now." If, beyond the number of allowed retries, you enter a DN that does not pass screening you recieve an invalid number annoucement followed by NACK treatment.

Deactivation of CFRA by the end user

Note: If an end user tries to use CFRA to deactivate CFW on a set where CFW is not active, the end user receives a confirmation announcement.

From a remote station

1. Go off-hook.

   Response:

   Dial tone

2. Enter the DISA DN.

   Response:

   “Please enter the n-digit DN to forward, followed by your PIN number."

3. Enter the DN, PIN, and #.

Remote Access to ISDN Call Forwarding (continued)

Response:

"Please enter a code to activate or to deactivate call forwarding."

4. Enter the CFF, CFU, or CFI deactivation code.

   Response:

   You receive a confirmation tone and your set is no longer call forwarded.

Activation of SPP by the end user

You program SPP at your telephone only. This restriction improves security.

At your telephone:

1. Enter the SPP feature access code.

   Response:

   An announcement prompts you to enter the access code of the feature that requires a PIN change (for CFRA, enter the CFRA access code).

   Note: Because PINs exist on an individual line and individual-feature basis, determine which feature requires a PIN change. A PIN change is only a requirement when you first use the PIN.

2. Enter the CFRA feature access code.

   Response:

   If the access code is correct, an announcement provides the name of the PIN feature related to the access code entered. An announcement the prompts you for the current PIN.

   If you enter an invalid access code, you can retry the code again. If you exceed the retry count, you receive feature re-order treatment. Examples of invalid entries for the code are no digits, an access code for a non-PIN feature, or digits which do not activate an IBN.

   Note: The retry count is a customer group option. The retry count determines the number of times you can re-enter a PIN during the SPP function. Use this number for each part of the SPP function: current PIN entry, new PIN entry, or new PIN reentry. The value of this option ranges from 1 to 3. The operating company enters datafill for this option.

3. Enter the current PIN.

   Response:

If you enter the correct PIN, an announcement prompts you to enter a new PIN.

If you enter an invalid PIN, an announcement prompts you to re-enter the PIN. If you exceed the retry count, you receive an error announcement (and an IBN136 log generates). After the error announcement, you route to feature re-order treatment.

4. Enter the new PIN.

   Response:

   If the new PIN is acceptable, an announcement prompts you to enter the new PIN again. If the PIN is not acceptable, an announcement prompts you to enter a different PIN. If you exceed the retry count for PIN entries, you receive an error announcement and the attempt routes to feature re-order treatment.

   Note: You cannot enter a new PIN that equals the current PIN.

5. Enter the new PIN again.

   Response:

   If you correctly enter the new PIN again, an announcement confirms the successful PIN change.

   If you incorrectly enter the new PIN again, an announcement prompts you to enter the new PIN again. If you exceed the retry count for PIN entries, you receive an error announcement. You then route to feature re-order treatment.

Billing

Remote Access to ISDN Call Forwarding does not affect billing.

Station Message Detail Recording

Remote Access to ISDN Call Forwarding does not affect Station Message Detail Recording.

Data lling of ce parameter s

Remote Access to ISDN Call Forwarding does not affect office parameters.

Remote Access to ISDN Call Forwarding (continued)

Data II sequence

The following table shows the table that requires datafill to implement Remote Access to ISDN Call Forwarding.

Data II tab les required for Remote Access to ISDN Call Forwarding

Table name	Purpose of table
KSETFEAT	Business Set and Data Unit Features. Table KSETFEAT contains line features assigned to the business sets. Because SERVORD updates this table, this section does not include a detailed description of datafill. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

Translation veri cation tools

Remote Access to ISDN Call Forwarding does not use translation verification tools.

SERVORD

Use SERVORD to provision remote access to ISDN CFW. Enter CFRA as input to indicate remote activation to ISDN CFW. The prompt where you enter CFRA differs by pre-NI-2 CFW and NI-2 CFW. This section provides separate examples for both.

- For pre-NI-2 CFW, enter CFRA at the OPTION prompt to provision CFRA.
- For NI-2 CFW, enter CFRA at the CFXTYPE prompt for SERVORD option CFXDNCT. CFRA applies to voice call types only.

If you enter Y at the FIRSTUSE prompt, the SPP feature is in use (if correct datafill exists to support SPP). For details about SPP datafill, see “Call Forwarding Remote Activation" and “Remote Call Forwarding without Unique PIN" in the RES section of this document.

SERVORD limitations and restrictions

An ISDN line must have CFF, CFI, or CFU provisioned before you can provision CFRA.

- For pre-NI-2 CFW, option CFF, CFI, or CFU must be present on the line before you can provision option CFRA.
- For NI-2 CFW, sub-feature CFF, CFI, or CFU (as provisioned by option CFXDNCT) must be present on the line before you can provision CFRA.

Remote Access to ISDN Call Forwarding (continued)

SERVORD prompts

The following table shows specific SERVORD prompts used to assign or add Remote Access to ISDN Call Forwarding to a line.

SERVORD prompts for remote access to ISDN CFW (Sheet 1 of 2)

Prompt	Valid input	Explanation
CALLTYPE	VI	The call type is voice (prompt appears when OPTION = CFXDNCT; for NI-2 CFW only).
CFXDNCT_KEYS	Numeric	Keys for CFXDNCT use
CFXTYPE	CFU, CFI, CFF, CFRA	This field indicates the CFW sub-feature. ***Note:*** CFRA is valid input for NI-2 CFW only.
CFRAPIN	2- to 4-digit PIN	The initial PIN assigned to the line by the operating company.
DN	Numeric	The directory number (DN)
DN_OR_KEYLIST	DN, KEYLIST	This field indicates if you must enter the required key list as a list of DNs or a list of key numbers. The keys in the list are assigned the CFW sub-feature indicated with prompt CFXTYPE.
FIRSTUSE	Y or N	This field indicates if the user needs to change the PIN before the first use of CFRA. This field applies when option SPP is datafill in table CUSTSTN. Refer to “Call Forwarding Remote Activation" and “Remote Call Forwarding without Unique PIN" in the RES section of this document for more details.
GROUP	Alpha-numeric	The name of the customer group
KEY	1 to 64	The number associated with the key set assigned the DN
KEYLIST	1 to 64	The list of keys available on the terminal.
LATANAME	Alpha-numeric	The calling local access and transport area name associated with the originator of the call.
LCC_ACC	ISDNKSET	Line class code

Remote Access to ISDN Call Forwarding (continued)

SERVORD prompts for remote access to ISDN CFW (Sheet 2 of 2)

Prompt	Valid input	Explanation
LEN_OR_LTID	1 to 8 alpha-numeric followed by a space and a terminal number	The LTID of the DN
LTG	0 to 255	Line treatment group
NCOS	0 to 255	Network class of service
NOTIFY	Y, N	Provides the switching mechanism for Reminder Notification (prompt appears when CFXTYPE = CFF, CFI, or CFU)
OPTION	CFXDNCT, CFU, CFF, CFI, CFRA	SERVORD option ***Note:*** CFXDNCT is a valid option for NI-2 CFW only. CFU, CFF, CFI, or CFRA is valid input for pre-NI-2 CFW only.
OPTKEY	1 to 64	The feature activator on the ISDN set assigned the option
OVRDACR	Y, N	This field indicates if override for account code is necessary (datafill for CFU).
RINGING	Y, N	This field indicates if a ring from a telephone speaker is necessary.
SUBGRP	0 to 7	Subgroup of the customer group

SERVORD example for adding remote access to pre-NI-2 CFW with the NEW command

The following SERVORD example shows the addition of remote access to pre-NI-2 CFW using the NEW command. CFRA is a SERVORD option. The Y response to prompt FIRSTUSE indicates that SPP is in use.

Remote Access to ISDN Call Forwarding (continued)

SERVORD example for adding remote access to pre-NI-2 CFW with the NEW command in prompt mode

```
>NEW
SONUMBER:  NOW 98 4 23 AM
> $
DN:
> 6137234444
LCC_ACC:
> ISDNKSET
GROUP:
> BNR
SUBGRP:
> 0
NCOS:
> 0
KEY:
> 1
RINGING:
> Y
LATANAME:
> NILLATA
LTG:
> 0
LEN_OR_LTID:
>NI1 1
OPTKEY:
>11
OPTION:
>CFU
```

– continued –

Remote Access to ISDN Call Forwarding (continued)

SERVORD example for adding remote access to pre-NI-2 CFW with the NEW command in prompt mode (continued)

```
OVRDACR:
>N
KEYLIST:
>1
KEYLIST:
>$
OPTKEY:
>11
OPTION:
>CFRA
CFRAPIN:
>60
FIRSTUSE:
>Y
OPTKEY:
>$
                                        – end –
```

SERVORD example for adding remote access to pre-NI-2 with the NEW command in no-prompt mode

```
> NEW $ 6137234444 ISDNKSET BNR 0 0 1 Y NILLATA 0 NI1 1 11 CFU N
1 $ 11 CFRA 60 Y $
```

SERVORD example for adding remote access to NI-2 CFW with the NEW command

The following SERVORD example shows the addition of CFRA to NI-2 CFW using the NEW command. For NI-2 CFW, CFRA is a sub-feature of option CFXDNCT. The Y response to prompt FIRSTUSE indicates that SPP is in use.

Remote Access to ISDN Call Forwarding (continued)

SERVORD example for adding remote access to NI-2 CFW with the NEW command in prompt mode

```
>NEW
SONUMBER:  NOW 98 5 12 AM
> $
DN:
> 6137231111
LCC_ACC:
> ISDNKSET
GROUP:
> BNR
SUBGRP:
> 0
NCOS:
> 0
KEY:
> 1
RINGING:
> Y
LATANAME:
> NILLATA
LTG:
> 0
LEN_OR_LTID:
>NI2 1
OPTKEY:
>13
OPTION:
>CFXDNCT
CALLTYPE:
>VI
CFXTYPE:
>CFU
OVRDACR:
>N
```

– continued –

Remote Access to ISDN Call Forwarding (continued)

SERVORD example for adding remote access to NI-2 CFW with the NEW command in prompt mode (continued)

```
NOTIFY:
>N
DN_OR_KEYLIST:
>KEYLIST
CFXDNCT_KEYS:
> 1
CFXDNCT_KEYS:
> $
OPTKEY:
> 13
OPTION:
> CFXDNCT
CALLTYPE:
> VI
CFXTYPE:
> CFRA
CFRAPIN:
> 600
FIRSTUSE:
> Y
OPTKEY:
> $
```

– end –

SERVORD example for adding remote access to NI-2 CFW with the NEW command in no-prompt mode

```
> NEW $ 6137231111 ISDNKSET BNR 0 0 1 Y NILLATA 0 NI2 1 13
CFXDNCT VI CFU N N KEYLIST 1 $ 13 CFXDNCT VI CFRA 600 Y $
```

SERVORD example for adding remote access to pre-NI-2 CFW with the ADO command

The following SERVORD example shows the addition of CFRA to pre-NI-2 CFW using the ADO command. For pre-NI-2 CFW, CFRA is a SERVORD option. The Y response to prompt FIRSTUSE indicates that SPP is in use. The following examples assume the terminal already has option CFF, CFU, or CFI provisioned.

Remote Access to ISDN Call Forwarding (continued)

SERVORD example for adding remote access to pre-NI-2 CFW with the ADO command in prompt mode

```
SO:
>ADO
SONUMBER: NOW 97 9 10 PM
>$
DN_OR_LEN:
> NI1 4
OPTKEY:
> 11
OPTION:
> CFRA
CFRAPIN:
>600
FIRSTUSE:
>Y
OPTKEY:
> $
```

SERVORD example for adding remote access to pre-NI-2 CFW with the ADO command in no-prompt mode

```
> ADO $ NI1 4 11 CFRA 600 Y $
```

SERVORD example for adding remote access to NI-2 CFW with the ADO command

The following SERVORD examples show the addition of CFRA to NI-2 CFW using the ADO command. CFRA is a sub-feature of option CFXDNCT. The Y response to prompt FIRSTUSE indicates that SPP is in use. The following examples assume the terminal already has CFF, CFU, or CFI provisioned by option CFXDNCT.

Remote Access to ISDN Call Forwarding (end)

SERVORD example for adding remote access to NI-2 CFW with the ADO command in prompt mode

```
SO:
>ADO
SONUMBER: NOW 97 9 10 PM
>$
DN_OR_LEN:
>NI2 1
OPTKEY:
> 7
OPTION:
> CFXDNCT
CALLTYPE:
>VI
CFXTYPE:
>CFRA
CFRAPIN:
> 600
FIRSTUSE:
> Y
OPTKEY:
> $
```

SERVORD example for adding remote access to NI-2 CFW with the ADO command in no-prompt mode

```
> ADO $ NI2 1 7 CFXDNCT VI CFRA 600 Y $
```

Uniform Usage Measurements for BBG

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: not applicable

Release applicability

NA010 and up

Uniform Usage Measurements for BBG was introduced in NA010.

Prerequisites

This document includes all the data table information for this functionality. Complete use of this functionality can require software or hardware not described in this document.

Description

The Uniform Usage Measurements for Basic Business Group (BBG) feature facilitates automatic message accounting (AMA) recording for the office, customer group, or line. The AMA records track the use of ISDN basic rate interface (BRI) BBG facilities and services. This feature consists of enhancements to table control, call processing, and billing record formatting.

Feature AF7503 introduces module code 074, ISDN basic business group. This module code identifies

- the BBG ISDN (BBG-I) call type
- the billing number of the BBG customer
- the associated virtual facility group (VFG) or trunk group number (TGN) used in the call

This feature appends module code 074 to all BBG-I enabled BRI AMA records.

Option ISDNBBGBILL in table AMAOPTS permits activation or deactivation of this feature for the office or switch. Option BBGI in table CUSTHEAD and option BBGI Y (or BBGI N) in table KSETFEAT complete the primary user interface. These two options allow the operating company to assign this feature for an office, customer group, or line.

Use the table editor to update tables AMAOPTS and CUSTHEAD. The Service Order System (SERVORD) utilities provide the interface to table KSETFEAT.

Uniform Usage Measurements for BBG (continued)

The Uniform Usage Measurements for BBG feature creates AMA records for four BBG-I capabilities as follows:

- Intercom Dialing—for station-to-station or intra-BBG ISDN calling
- Public Network Access—for calls that originate from and terminate to the public network from within a BBG-I
- Private Facility, Network Access—for calls that originate from and terminate to BBG-I private facilities
- Facility Overflow—identifies when a VFG for public or private access reaches its limit of calls and is allowed to overflow

The Uniform Usage Measurements for BBG feature improves the record generation capabilities of the AMA system. These improvements include

- Updated applications of ISDN call type records. These applications include AMA records with call codes 045 and 184 for non-billable originating and terminating BBG-I calls.
- Updated applications of existing ISDN module codes and the introduction of ISDN module code 074. AMA records for BBG-I calls use module codes 070/071 and 074. Uniform Usage Measurements for BBG does not affect module codes 070 and 071. This feature only appends module code 074 to the AMA record if the call uses a BBG-I facility or service.

The Uniform Usage Measurements for BBG feature improves AMA reporting for both billable and non-billable ISDN BRI user services. This feature supports BBG-I AMA record generation for calls that originate from or terminate to a BRI facility. Operating companies can generate detailed information on customer use of BBG-I facilities and features.

Operation

The following sections of this document describe each of the functionalities included in this activity:

- Table control for Uniform Usage Measurements for BBG
- Call processing
- BBG-I AMA record formatting

BBG-I table control

Table control provides the primary user interface that controls the activation and deactivation of the BBG-I AMA recording. Tables AMAOPTS, CUSTHEAD, and KSETFEAT provide this interface as indicated:

- AMAOPTS—permits the assignment of the Uniform Usage Measurements for BBG feature by the office or the switch. Select option

Uniform Usage Measurements for BBG (continued)

ISDNBBGBILL and assign it a value of ON to permit BBG-I AMA recording office wide. Option ISDNBBGBILL in table AMAOPTS completely deactivates BBG-I AMA billing for the office when set to OFF. This state overrides the values of the BBGI options set in table CUSTHEAD and table KSETFEAT.

- CUSTHEAD—permits activation or deactivation of BBG-I AMA recording by the customer group. Assign option BBGI for a customer group in table CUSTHEAD. Use of option BBGI Y (or BBGI N) in table KSETFEAT overrides option BBGI in table CUSTHEAD.
- KSETFEAT—permits the activation or deactivation of BBG-I AMA recording for each line. Option BBGI has a boolean enhancement. BBGI N indicates that BBG-I AMA recording is not active for this line. BBGI Y indicates that BBG-I AMA recording is active for this line. If neither option BBGI Y nor option BBGI N is in table KSETFEAT, the customer group option in table CUSTHEAD controls BBG-I AMA recording. When present, option BBGI Y (or option BBGI N) in table KSETFEAT overrides the customer group data setting.

BBG-I AMA call processing

The three ISDN BBG capabilities produce AMA records as follows:

- Intercom Dialing—produces records for station-to-station or intra-BBG ISDN calling. The types of network connections supported for intercom dialing are
  - — BRI-to-BRI
  - — BRI-to-non-BRI
  - — non-BRI-to-BRI
- Public Network Access—produces records for calls originating from and terminating to the public network for calls within a BBG-I. The types of network connections supported for public network access are
  - — BRI-to-trunk/VFG
  - — trunk/VFG-to-BRI
- Private Facility, Network Access—produces records for calls that originate from and terminate to BBG-I private facilities. The types of network connections supported for private network access are
  - — BRI-to-trunk/VFG
  - — trunk/VFG-to-BRI

Note: Tandem network connections (trunk-to-trunk) are not supported.

Uniform Usage Measurements for BBG (continued)

When a VFG for public or private access reaches its limit of calls and overflows, the switch produces records. The types of network connections supported for VFG access are

- BRI-to-VFG
- VFG-to-BRI

Note: VFG-to-VFG calls are not supported.

Call routing datafill provides VFG overflow. If a VFG reaches its limit, the switch attempts to continue, or overflow, to the next route element in the route list. If no route is available, the switch blocks the following calls and produces no additional records.

The switch transmits the recorded information to the revenue accounting office (RAO) in the same data stream as the AMA records for the switch.

BBG-I AMA record formatting

Station-to-station or intra-BBG ISDN calls produce intercom dialing records as follows:

- BRI-to-BRI—forces an originating call code 045 record and appends module code 074
- BRI-to-non-BRI
  - — forces an originating call code 045 record and appends module code 074
  - — generates no record for the terminating facility because it is not an ISDN line
- non-BRI-to-BRI—presents a terminating billing condition. In this case the switch forces a call code 184 record and appends module code 074.

Uniform Usage Measurements for BBG (continued)

Calls that originate from and terminate to the public network from a BBG-I facility produce Public Network Access records as follows:

- BRI-to-trunk/VFG (public)
  - — If the call is billable, append module code 074.
  - — If the call is not billable, force a call code 045 record and append module code 074.
- trunk/VFG-to-BRI (public)
  - — If the call is billable, append module code 074.
  - — If the call is not billable and the terminating BRI line is a BBG-I facility, the switch forces a call code 184 record and appends module code 074.

Calls that originate on and terminate to BBG-I private facilities produce Private Facility, Network Access records as follows:

- BRI-to-trunk/VFG (private)
  - — If the call is billable, append module code 074.
  - — If the call is not billable, force a call code 045 record and append module code 074.
- trunk/VFG-to-BRI (private)
  - — If the call is billable, append module code 074.
  - — If the call is not billable and the terminating BRI line is a BBG-I facility, force a call code 184 record and append module code 074.

Note: The two previous paragraphs also describe the records generated for facility overflow for BRI-to-VFG calls.

Translations table o w

The Uniform Usage Measurements for BBG translations tables are described in the following list:

- Table AMAOPTS controls the activation and scheduling of the recording options for AMA. This table contains the OPTION and SCHEDULE fields.
- Table CUSTHEAD lists the values and options assigned to customer groups.
- Table KSETFEAT lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE. This table also lists the Meridian digital telephone sets and DUs listed in table IVDINV. SERVORD automatically datafills field FEATKEY, subfield FEAT with

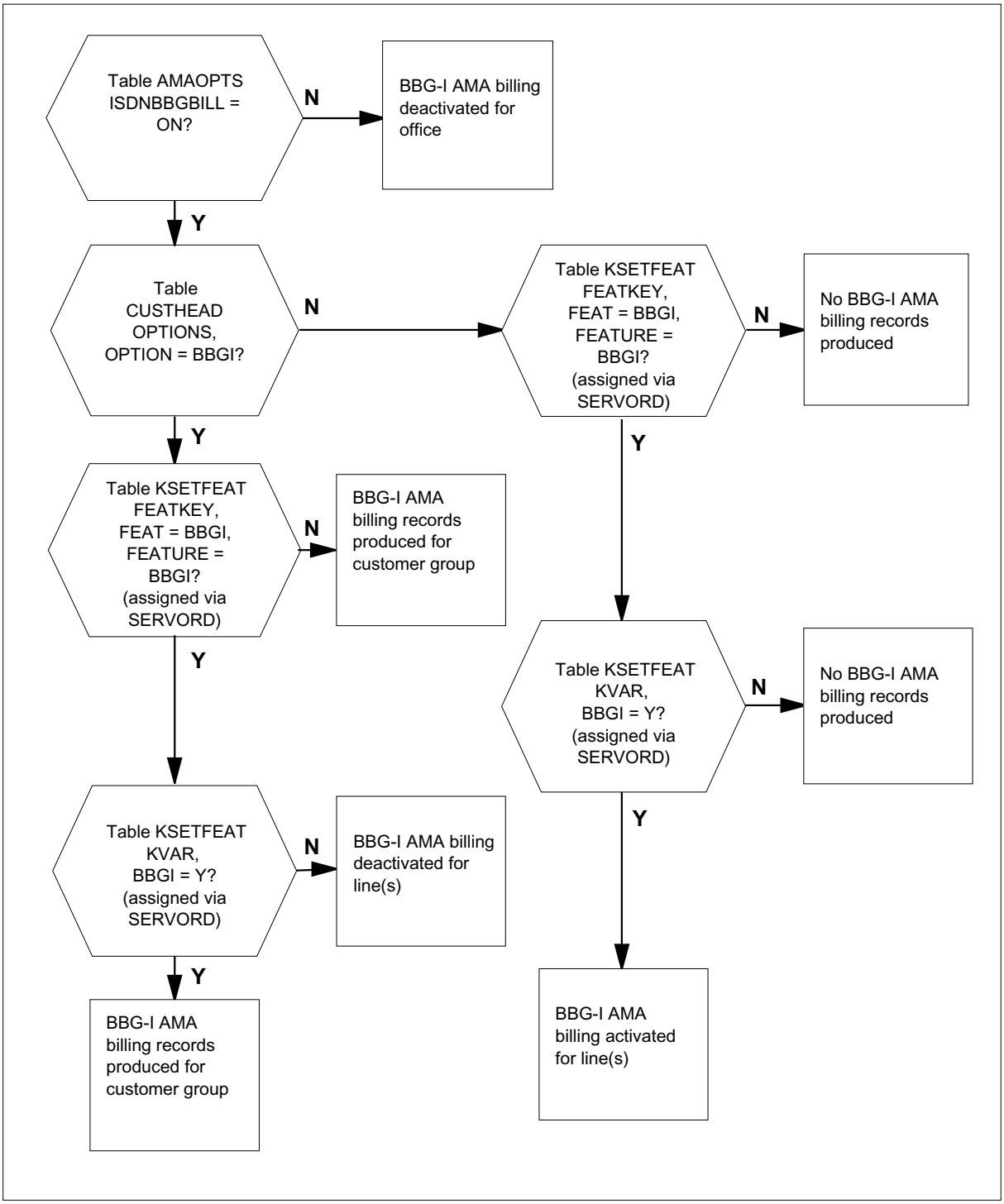
Uniform Usage Measurements for BBG (continued)

BBGI. SERVORD automatically fills field FEATURE with BBGI. Field KVAR contains the keylist for BBGI, which is 1.

The following flowchart shows the Uniform Usage Measurements for BBG translation process.

Uniform Usage Measurements for BBG (continued)

Table o w for Uniform Usage Measurements for BBG



Uniform Usage Measurements for BBG (continued)

The following table lists the datafill content used in the flowchart.

Data II e xample for Uniform Usage Measurements for BBG

Datafill table	Example data
AMAOPTS	ISDNBBGBILL ON
CUSTHEAD	CXT3 TST1 NIL (VACTRMT 0) (EXTNCOS 0) (ACCT 6 N N) (FETXLA RXCFN) (AUTH EAST N N) (ACR ACCT 0) (LPA 60 8) (BBGI) $
KSETFEAT	WITS 2 11 BBGI BBGI NWITS 8 1 BBGI BBGI Y

Limitations and restrictions

Uniform Usage Measurements for BBG has no limitations or restrictions.

Interactions

Uniform Usage Measurements for BBG has no functionality interactions.

Activation/deactivation by the end user

Uniform Usage Measurements for BBG requires no activation or deactivation by the end user.

Billing

The Uniform Usage Measurements for BBG feature enhances the record generation capabilities of the AMA system. This feature implements the following changes:

- modified applications of ISDN call type records
  - — This feature introduces production of AMA records with call codes 045 and 184 for non-billable originating and terminating BBG-I calls.
- modified applications of existing ISDN module codes and the introduction of module code 074
  - — AMA records for BBG-I calls that contain module codes 070/071 and 074. Module codes 070 and 071 are unchanged. Module code 074 indicates that a call uses a BBG-I facility or service.

Uniform Usage Measurements for BBG supports record generation for calls that originate or terminate to a BRI facility. This feature supports originations on VFGs and trunk groups if they are members of a BBG-I customer group that terminates to a BRI facility.

Uniform Usage Measurements for BBG (continued)

The descriptions for call codes 045 and 184 are

- call code 045: ISDN User Service
- call code 184: ISDN Terminating User Service

Call code 045 identifies instances of the use of ISDN BRI service for non-billable originating BBG-I calls. Call code 184 identifies instances of the use of ISDN BRI service for non-billable terminating BBG-I calls. Call codes 045 and 184 are now supported DMS switch call types. The Uniform Usage Measurements for BBG feature causes no modifications to their applications or their record structures.

Uniform Usage Measurements for BBG introduces module code 074: ISDN Basic Business Group. This module code identifies the BBG-I call type, BBG customer billing number, and the VFG or TGN used in the call. The Uniform Usage Measurements for BBG feature appends module code 074 to all BBG-I enabled BRI AMA records. The record produced is like the following example:

```
MODULE CODE:074C BBG CALL TYPE:022C BBG CHARGEABLE DATA
NPA:613C BBG CHARGEABLE DATA CO ENDPT NUM:6215982C
VIRTUAL FACILITY GROUP:91234C MODULE CODE:000C
```

Record: structure code 0001/call code 045

The following figure is an example of an AMA record generated for call code 045 (ISDN User Service). This example has a structure code 0001 with an appended module code 074.

This example shows an originating record for a BRI-to-trunk call. For originating BBG-I customers, a structure code 0001 record provides for forced detailed records. Advanced Intelligent Network (AIN) calls would have structure code 0220.

Uniform Usage Measurements for BBG (continued)

Call code 045

```
*HEX ID:AA STRUCTURE CODE:40001C CALL CODE:045C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C DATE:80520C TIMING IND:00000C STUDY
IND:0000000C CLD PTY OFF-HK:0C SERVICE OBSERVED:0C OPER
ACTION:0C SERVICE FEATURE:000C ORIG NPA:613C ORIG
NUMBER:6215982C OVERSEAS IND:0C TERM NPA:00613C TERM
NUMBER:6215988C CONNECT TIME:0917374C ELAPSED
TIME:000000044C MODULE CODE:306C OLIP:031C MODULE
CODE:071C BEARER CAPABILITY:101C NETWORK INTERWORKING:0C
RELEASE CAUSE INDICATOR:00016C MODULE CODE:074C BBG CALL
TYPE:021C BBG CHARGEABLE DATA NPA:613C BBG CHARGEABLE
DATA CO ENDPT NUM:6215982C VIRTUAL FACILITY GROUP:31099C
MODULE CODE:000C
```

Record: structure code 0001/call code 184

The following figure is an example of an AMA record for call code 184 (ISDN Terminating User Service). This example has a structure code 0001 with an appended module code 074.

This example shows an originating record for a trunk-to-BRI call. For terminating BBG-I customers, a structure code 0001 record provides for forced detailed records. AMA records for AIN calls have structure code 0221.

Call code 184

```
*HEX ID:AA STRUCTURE CODE:40001C CALL CODE:184C SENSOR
TYPE:036C SENSOR ID:0619351C REC OFFICE TYPE:036C REC
OFFICE ID:0619351C DATE:80520C TIMING IND:00000C STUDY
IND:0000000C CLD PTY OFF-HK:0C SERVICE OBSERVED:0C OPER
ACTION:0C SERVICE FEATURE:000C ORIG NPA:613C ORIG
NUMBER:6215982C OVERSEAS IND:1C TERM NPA:00613C TERM
NUMBER:6215988C CONNECT TIME:0919037C ELAPSED
TIME:000000034C MODULE CODE:306C OLIP:031C MODULE
CODE:073C TERM SIG OR SUP SERVICE USAGE:111111000000000C
IC/INC PREFIX:FFFFFF BEARER CAPABILITY:101C MODULE
CODE:074C BBG CALL TYPE:051C BBG CHARGEABLE DATA NPA:613C
BBG CHARGEABLE DATA CO ENDPT NUM: 6215988C VIRTUAL
FACILITY GROUP:31088C MODULE CODE:000C
```

Module code 074

The switch produces an AMA record with module code 074 when

- option ISDNBBGBILL is ON in table AMAOPTS
- option BBGI is active in table CUSTHEAD or table KSETFEAT

Uniform Usage Measurements for BBG (continued)

Module code 074 identifies the BBG-I call type and the VFG or TGN used in the call. The following table lists the characters in the BBG call type field (field 407) of module code 074.

BBG call type eld 407 in module code 074

Character	Value	Meaning
1	0	BBG call
2—3	10	Intercom (station-to-station)
	11	Intercom VFG controlled access
	12	Intercom VFG overflow
	20	Originating public network access
	21	Originating public network VFG controlled access
	22	Originating public network VFG overflow
	30	Terminating public network access
	31	Terminating public network VFG controlled access
	32	Terminating public network VFG overflow
	40	Originating private network access
	41	Originating private network VFG controlled access
	42	Originating private network VFG overflow
	50	Terminating private network access
	51	Terminating private network VFG controlled access
	52	Terminating private network VFG overflow

Uniform Usage Measurements for BBG (continued)

The following table lists the characters in the VFG field (field 83) of module code 074.

VFG/TGN eld 83 in module code 074

Character	Value	Meaning
1	1	Indicates that the call is routed over a non-SS7 trunk
	3	Indicates that the call is routed over an SS7 trunk
	9	If the BBG call uses VFG routing, the value “9" indicates that the signaling type is unknown.
	F	Indicates that the call is not routed over a trunk or a VFG
2—5	nnnn	Indicates the 4-digit trunk group number (TGN) or virtual facility group (VFG) number
	FFFF	Indicates that the call is not routed over a trunk or a VFG

The following table provides information for module code 074.

Module code 074

Information	Field number	Number of characters
Module code identification	88	4
BBG call type	407	4
BBG billing NPA	188	4
BBG billing CO - end point number	189	8
Virtual Facility Group	83	6

Station Message Detail Recording

Uniform Usage Measurements for BBG does not affect Station Message Detail Recording.

Data lling of ce parameter s

The following table shows the office parameters used by Uniform Usage Measurements for BBG. For more information about office parameters, refer to *Office Parameters Reference Manual.*

Of ce parameter s used by Uniform Usage Measurements for BBG

Table name	Parameter name	Explanation and action
OFCENG	CRS_SUBRU_POOL2_ SIZE	Uniform Usage Measurements for BBG increases the use of the recording units controlled by this parameter. The increase occurs when billing occurs for originating and terminating BBG-I calls. If option ISDNBBGBILL in table AMAOPTS is ON, and BBGI is active for a customer group, the increased use of recording units can be substantial depending on the number of billable BBG-I calls.
OFCENG	CRS_PRU_POOL2_ SIZE	Uniform Usage Measurements for BBG increases the use of the recording units controlled by this parameter. The increase occurs when billing occurs for originating and terminating BBG-I calls. If option ISDNBBGBILL in table AMAOPTS is ON, and BBGI is active for a customer group, the increased use of recording units can be substantial depending on the number of billable BBG-I calls.
Note: If an office does not activate option ISDNBBGBILL in table AMAOPTS, this feature does not affect the CRS_SUBRU_POOL2_SIZE and CRS_PRU_POOL2_SIZE parameters.		

Data ll sequence

The following table lists the tables that require datafill to implement Uniform Usage Measurements for BBG. The tables are listed in the order in which they are to be datafilled.

Data ll tab les required for Uniform Usage Measurements for BBG (Sheet 1 of 2)

Table	Purpose of table
AMAOPTS	Automatic Message Accounting Options. Use this table to control the activation and scheduling of the recording options for AMA. To activate BBGI Billing, set ISDNBBGBILL in the OPTION field to ON.

Uniform Usage Measurements for BBG (continued)

Data ll tab les required for Uniform Usage Measurements for BBG (Sheet 2 of 2)

Table	Purpose of table
CUSTHEAD	Customer Group Head. Table CUSTHEAD defines the basic translation and routing characteristics for the customer group. The BBGI parameter allows operating companies to control the recording of BBG-I calls for members of a customer group.
KSETFEAT	Business Set and Data Unit Feature. This table lists the line features that are assigned to the business sets and data units (DU) listed in table KSETLINE, and also the Meridian digital telephone sets and DUs listed in table IVDINV. This table is automatically updated when new options are added to a business set by SERVORD. SERVORD configures the line option BBGI here. ***Note:*** This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.

Data lling tab le AMAOPTS

The following table shows the datafill related to Uniform Usage Measurements for BBG for table AMAOPTS. Only those fields that apply directly to Uniform Usage Measurements for BBG are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le AMAOPTS (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
OPTION		see subfield	Option. This field consists of subfield AMAOPT.
	AMAOPT	ISDNBBGBILL	AMA option. This option controls BBG-I recording options switch-wide. If ISDNBBGBILL is OFF (the default), BBG-I recording cannot occur. If option ISDNBBGBILL is ON • table CUSTHEAD controls BBG-I billing by customer group • table KSETFEAT controls BBG-I billing for each line ***Note:*** The BBGI N or BBGI Y options in table KSETFEAT override option BBGI in table CUSTHEAD.

Data lling tab le AMAOPTS (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
SCHEDULE		see subfield	Schedule. This field consists of subfield AMASEL, ONDATE, OFFDATE, SCHED, ONTIME and OFFTIME.
	AMASEL	ON	ON: Activate the option immediately.

Data ll e xample for table AMAOPTS

The following example shows sample datafill for table AMAOPTS.

MAP display example for table AMAOPTS

```
OPTION            SCHEDULE
-------------------------------------------------------
ISDNBBGBILL       ON
```

Data lling tab le CUSTHEAD

The following table shows the datafill related to Uniform Usage Measurements for BBG for table CUSTHEAD. Only fields that apply directly to Uniform Usage Measurements for BBG are shown. For a description of the other fields, refer to the data schema section of this document.

Data lling tab le CUSTHEAD

Field	Subfield or refinement	Entry	Explanation and action
CUSTNAME		alphanumeric (1 to 16 characters)	Customer group name. Enter the customer group name.
OPTIONS		see subfield	Options. This field consists of subfield OPTION.
	OPTION	BBGI	Option. This subfield specifies the Uniform Usage Measurements for BBG feature. Enter BBGI.

Uniform Usage Measurements for BBG (continued)

Data Il e xample for table CUSTHEAD

The following example shows sample datafill for table CUSTHEAD. Option BBGI allows the operating company to activate or deactivate BBG-I recording at the customer group level.

The BBGI Y and BBGI N options in table KSETFEAT override option BBGI in table CUSTHEAD. Option BBGI Y and option BBGI N in table KSETFEAT give the operating company the ability to control BBG-I recording at the line level.

MAP display example for table CUSTHEAD

```
CUSTNAME CUSTXLA DGCOLNM IDIGCOL OPTIONS
------------------------------------------------------------------------
IBNTEST  CXT3 TST1 NIL(VACTRMT 0) (EXTNCOS 0) (ACCT 6 N N) (FETXLA
        RXCFN) (AUTH EAST N N) (ACR ACCT 0) (LPA 60 8) (BBGI) $
```

SERVORD

You must use SERVORD to assign option BBGI in table KSETFEAT.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to Uniform Usage Measurements for BBG:

- Assign option BBGI at any time. This option does not affect BBG-I billing unless the AMAOPTS tuple ISDNBBGBILL is ON.
- If option BBGI is present in table CUSTHEAD, enabling option BBGI in table KSETFEAT activates BBG-I recording for the entire customer group. Otherwise, option BBGI in table KSETFEAT controls BBG-I recording for each ISDN BRI line.

Uniform Usage Measurements for BBG (end)

SERVORD prompts

The following table shows the SERVORD prompts used to assign Uniform Usage Measurements for BBG to an ISDN BRI line or customer group.

SERVORD prompts for Uniform Usage Measurements for BBG

Prompt	Valid input	Explanation
DN_OR_LEN	7-digit DN or LEN	Specifies the 7-digit DN or LEN of the line to be changed
BBGI_STATE	Y or N	Indicates if the feature is enabled for the line
OPTION	BBGI	Indicates the name of the option
OPTKEY	1 to 69	Indicates the key on an MBS to which an option is assigned

SERVORD example for adding Uniform Usage Measurements for BBG

The following SERVORD example shows how to add Uniform Usage Measurements for BBG to an existing ISDN BRI line with the ADO command.

SERVORD example for Uniform Usage Measurements for BBG in prompt mode

```
> ADO
SONUMBER:  NOW 98 1 23 PM
>
DN_OR_LEN:
> 6211590
OPTKEY:
> 1
OPTION:
> BBGI
BBGI_STATE:
> Y
OPTKEY:
> $
```

SERVORD example for Uniform Usage Measurements for BBG in no-prompt mode

```
> ADO 6211590 1  BBGI Y $
```

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