

# 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 3 of 25

Common Datafill and Miscellaneous Services Part 3 of 3

LET0015 and up Standard 14.02 May 2001

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DMS-100 Family

## **North American DMS-100**

Translations Guide Volume 3 of 25

Common Datafill and Miscellaneous Services Part 3 of 3

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Information, TOPS Position Controller, Unbundling



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# 1 Datafilling BAS Generic (continued)

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The CCS7 system divides into layers that serve many applications. This chapter describes the tables that the Base CCS7 operating software use. This chapter also describes the datafill in tables that configure the hardware for link peripheral processor (LPP)-based platforms.

This chapter describes the following equipment tables:

- PMLOADS
- LTCINV
- LIMINV
- LIMCDINV
- LIMPTINV
- SUSHELF
- LIUINV

This chapter describes the following message transfer part (MTP) tables:

- C7TIMER
- C7CNGSTN
- C7NETWRK
- C7ALIAS
- C7LKSET
- C7LINK
- C7RTESET

This chapter describes the following signaling connection control part (SCCP) tables:

- C7NETSSN
- C7LOCSSN
- C7RSSCRN

1-2 Datafilling BAS Generic (continued)

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- C7RPLSSN
- C7GTTYPE
- C7GTT

---

## Feature Group A - AMA

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### Order codes

Functional group order code: BAS00003

Functionality order code: does not apply

### Release applicability

BCS34 and later versions

### Requirements

Feature Group A - AMA does not have requirements.

### Description

Several procedures are available for an inter-LATA carrier (IC) to connect facilities to operating company networks. These procedures are feature groups. The earliest and most simple of these procedures is Feature Group A (FGA). The FGA provides line-side access from an end office (EO) to a specified IC.

To gain FGA access to the IC, a subscriber dials a local seven-digit directory number (DN) assigned to a specified IC. An IC with an FGA access arrangement with an EO is an FGA carrier.

Other access arrangements include Feature Group B (FGB), Feature Group C (FGC) and Feature Group D (FGD).

### Stages of an FGA call

An FGA call occurs in two stages. These two stages are the originating part of the call and the terminating part of the call. The originating part of an FGA call occurs between a subscriber and an FGA carrier. The terminating part of an FGA call occurs between an FGA carrier and the called party.

When access between the originating EO and an IC is over FGA access lines, the call is an originating FGA call. When access between an IC and the terminating EO is over FGA access lines, the call is a terminating FGA call. The originating EO is the EO to which the subscriber line connects. The terminating EO is the EO to which the called party line connects. The line between the calling party and the originating EO is a normal subscriber-to-EO line. The line between the terminating EO and the called party are normal subscriber-to-EO line. These lines are not FGA lines. The lines between an IC and an EO are FGA lines.

## **Feature Group A - AMA** (continued)

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The three following FGA call events can occur:

- A call can be FGA originating (FGA lines between the originating EO and the IC). A call can be FGA terminating (FGA lines between the IC and the terminating EO).
- A call can be FGA originating (FGA lines between the originating EO and the IC). This call can use FGB, FGC, or FGD trunks between the IC and the terminating EO.
- A call can use FGB, FGC, or FGD trunks between the originating EO and the IC. This call can be FGA terminating (FGA lines between the IC and the terminating EO).

### **Billing Terminating Calls to a Line (BR0520)**

The following line class codes are compatible with the terminating billing option (TRMBOPT):

1FR single party, flat rate

1MR single party, metered rate

CFW plain old telephone service (POTS) call forwarding

PBX private brach exchange

PBM PBX message register

IBN Integrated Business Network

*Note:* IBN is now the Meridian Digital Centrex (MDC).

### **FGA Terminating Record (BR0768)**

An FGA carrier that makes an inter-LATA call from a 1FR or a 1MR line normally produces one billing record with call code 110. The system now generates an additional Bellcore automatic message accounting (AMA) record with call code 132.

The following line options are compatible with the terminating FGA option:

CLI calling line identification

SHU stop hunt

RSUS requested suspension

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**Feature Group A - AMA** (continued)

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SLU	subscriber line usage
SDY	line studies
DOR	denied originating service
DTM	denied terminating service
LCDR	local call detail recording
CLF	malicious call hold
NLT	no line insulation test
NOH	no receiver off hook tone
SUS	suspended service
DGT	Digitone
PIC	primary inter-LATA carrier

**Operation**

The description of operation provides the operational description and specifications for feature package NTX083AA.

**Billing on Terminating Calls to a Line (BR0520)**

Feature BR0520 causes the system to generate an AMA record. The system generates this record for calls that terminate on a specified line. This ability allows the system to produce an AMA record for an originating FGA call.

The use of hunt groups allows the production of an AMA record for calls that terminate on a specified line. The FGA lines in the originating EO are arranged as a hunt group.

*Note:* The system accepts single-line hunt groups.

The TRMBOPT option is assigned in table HUNTGRP to the pilot DN of the hunt group. The system generates an AMA record when a call goes to a member of a hunt group with the TRMBOPT.

Feature BR0520 is compatible with Bellcore AMA record formats. Bellcore AMA format identifies each type of call by call code. Each call code can have different structure codes associated with it. These structure codes define the

## Feature Group A - AMA (continued)

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attributes of each call code. Call code 131 132 indicates an originating FGA call.

### FGA Terminating Record (BR0768)

Feature BR0768 is present as a line option. Feature BR0768 causes the system to produce an AMA record for terminating FGA calls. Assign the FGA to the line in table LENLINES to define a terminating FGA line.

FGA is assigned in the terminating EO to a line from an FGA carrier. The system generates an AMA record when a call occurs from an FGA carrier to the terminating EO.

This feature is compatible with Bellcore AMA record format. Call code 132 indicates a terminating FGA call.

### Translations table flow for feature BR0520

A description of the Feature Group A - AMA translations tables for feature BR0520 appears in the following list:

- Table LENLINES contains the hardware assignments of working lines and options assigned to the lines.
- Table LINEATTR determines the index in screening tables and first defines the type of line that generates the call.
- Table STDPRTCT sets the type of call that is processed (NP, DD, OA). Table STDPRTCT performs other functions that relate to call routing and screening. Screening in table STDPRTCT originates from field PRTNM in table LINEATTR.
- The leading digits of the dialed number determines the subtable STDPRT index. When leading digits are present, the call type is set. The leading digits are stripped when appropriate. Routing is set to continue translations.
- Table HNPACONT contains a list of appropriate home or serving numbering plan areas (NPA) and serving translation schemes (STS). Table LINEATTR stores the serving NPA for the FGA lines. The serving NPA for the FGA lines associate with the line attribute assigned to the lines.
- Subtable HNPACODE lists the route, treatment or table to which translations must route for each three-digit serving NPA (SNPA) or STS. Table HNPACONT defines the SNPA and STS. The assignment of a code type occurs for each code that table HNPACONT defines. The assignment of a code type of DN must occur to the FGA line. Use of the DN selector occurs with lines that terminate in the EO.

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**Feature Group A - AMA** (continued)

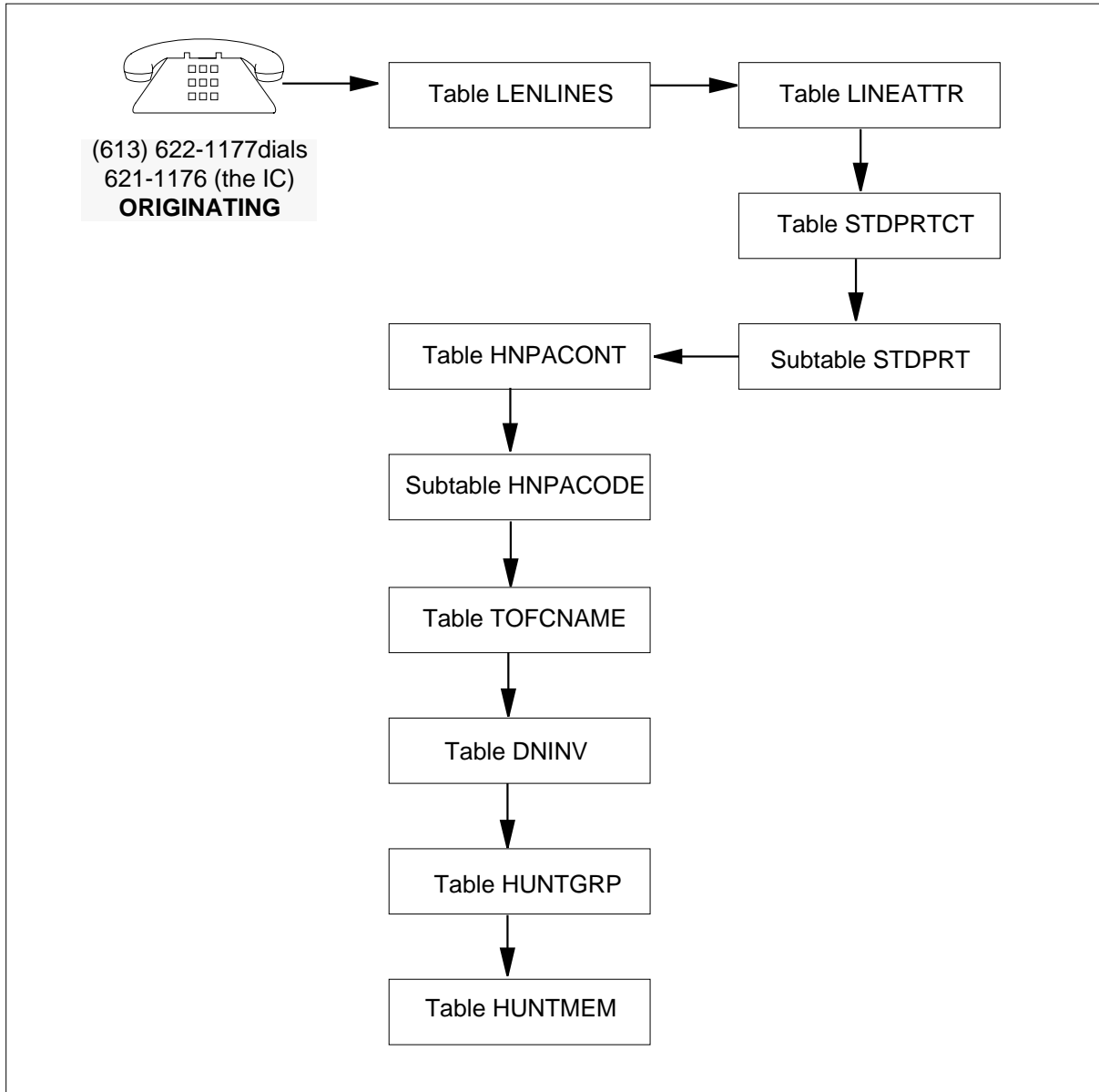
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- Table TOFCNAME defines terminating offices in the switch. A terminating office is a different group of area code and office code.
- Table DNINV lists the DNs in the switch and any important information. Important information can include to which LEN each DN is assigned, or to which hunt group.
- Table HUNTGRP defines the hunt groups that associate with an office. Table HUNTGRP is the table that defines the FGA carrier hunt group. For feature BR0520, table HUNTGRP defines the hunt group associated with the FGA carrier. For an originating FGA call to be billed correctly, assign the TRMBOPT to the pilot DN of the FGA carrier hunt group. Enter a Y (yes) in the TRMBOPT field of table HUNTGRP to assign this option. This entry allows the system to generate an AMA record for each call to an FGA carrier hunt group member.
- Table HUNTMEM lists the members assigned to the hunt groups that table HUNTGRP lists.

The Feature Group A - AMA translation process for feature BR0520 appears in the following flowchart.

## Feature Group A - AMA (continued)

Table flow for Feature Group A - AMA





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**Feature Group A - AMA** (continued)

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A list of the datafill content that the flowchart uses appears in the following table. In the following datafill table example the calling number is (613) 622-1177. The called number is 622-1176, with a call code of 131.

**Datafill example for Feature Group A - AMA (origination)**

Datafill table	Example data
LENLINES	HOST 00 0 00 2 S 0 6221177 DT 0 DGT
LINEATTR	0 1FR NONE NT FR01 0 613 PRT1 L613 TSPS 10 NIL LATA2 0 NIL (LCABILL) \$
STDPRTCT	PRT1 ( 1) ( 1)
STDPRTCT .STDPRT	50 60 N NP 0 NA
HNPACONT	613 128 1 ( 16) ( 1) ( 0) ( 0)
HNPACONT .HNPACODE	622 622 DN 613 622
TOFCNAME	613 622
DNINV	613 622 1176 H 0 01
HUNTGRP	0 613 6211176 DNH N N Y RCVD N N N N 10
HUNTMEM	0 1 N D 6211176 N

**Description of translations progression (origination)**

The earlier translations flow as follows.

- Line (613) 622-1177 dials 622-1176 to access an inter-LATA carrier.
- The line equipment number (LEN) of the calling party determines the table LENLINES index.
- Table LINEATTR is indexed from table LENLINES with the Line attribute index number.
- From table LINEATTR, the translations move to table STDPRTCT with the use of the Pretranslator name specified in table LINEATTR.
- From table STDPRTCT, translations index in subtable STDPRT with the leading digits dialed (622). The tuple that associates with this number sets the call type as No prefix (NP) or local. This tuple routes the call to table

## Feature Group A - AMA (continued)

---

HNPACONT with an N and NA selector. This tuple indicates that the number dialed does not include a prefix digit (0 or 1).

*Note:* A check of subtable STDPRT occurs. The check does not find tuple (6221176). The system ignores the table.

- From subtable STDPRT, translations index in table HNPACONT with the area code of the calling line (613).
- Subtable HNPACODE is indexed from table HNPACONT with the leading digits dialed (622). The tuple associated with this NXX specifies a DN selector that provides an area code for the number dialed and routes the call to table TOFCNAME.
- Table TOFCNAME is indexed with the area code and NXX that subtable HNPACODE provides.
- From table TOFCNAME, table DNINV is indexed with the area code, NXX and the last four digits of the number dialed. The last four digits are the DEFG digits. The tuple associated with the number dialed indicates that the tuple is part of a hunt group.
- In table HUNTGRP, the appropriate tuple is indexed with the hunt group number that table DNINV provides. The tuple provides information about the hunt group. For this feature, field TRMBOPT is Y. This action generates an AMA call code of 131.
- Table HUNTMEM is indexed with the hunt group number and the member number that table DNINV provides. The tuple associated with this table indicates information about the member.
- Translations continue to LENLINES and connect to the inter-LATA carrier. The carrier returns dial tone to the subscriber that enters appropriate codes and the long-distance number wanted.

### Translations table flow for feature BR0768

A description of the Feature Group A translation tables for feature BR0768 appears in the following list.

- Table LENLINES contains the hardware assignments of all working lines and the options assigned to the lines.
- Table LINEATTR determines the index in screening tables and first defines the type of line that generates the call.
- Table STDPRTCT sets the type of call processed (NP, DD, OA). This table performs other functions that relate to call routing and screening. The screen in table STDPRTCT originates from field PRTNM in table LINEATTR.

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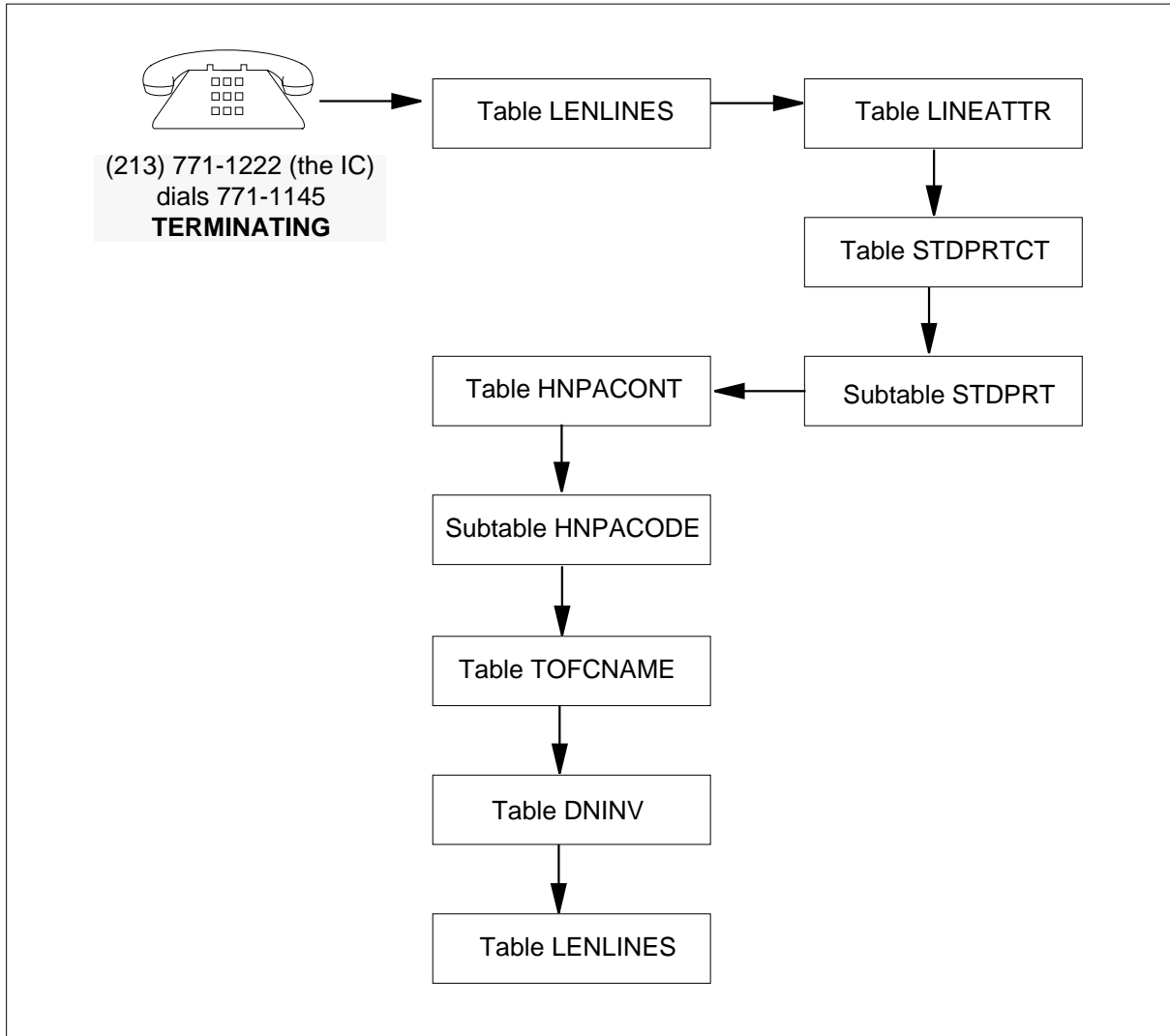
**Feature Group A - AMA** (continued)

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- The leading digits of the dialed number determine the subtable STDPRT index. When leading digits are present, the call type is set. The leading digits are stripped when appropriate. Routing is set to continue translations.
- Table HNPACONT contains a list of the correct home or serving NPA and STS. Table LINEATTR stores the serving NPAs for the FGA lines. The serving NPA for the FGA lines associate with the line attribute assigned to the lines.
- Subtable HNPACODE lists the route, treatment or table to which translations must route for each three-digit serving NPA (SNPA) or STS. Table HNPACONT defines SNPA or STS. The assignment of a code type to each code that table HNPACONT defines occurs. The assignment of a code type of DN to the FGA line must occur. The use of the DN selector occurs with lines that terminate in the EO.
- Table TOFCNAME defines terminating offices in the switch. A terminating office is a different group of area code and office code.
- Table DNINV lists the DNs in the switch and any important information. Important information includes to which LEN or hunt group each DN is assigned.

## Feature Group A - AMA (continued)

### Table flow for DNINV



A list of the datafill content that the flowchart uses appears in the following table.

**Feature Group A - AMA** (continued)

In the following datafill example, the calling number is (213) 771-1222. The called number is 771-1145, with a call code of 132.

**Datafill example for Feature Group A - AMA(terminating)**

Datafill table	Example data
LENLINES	HOST 00 0 01 24 S 0 7711222 DT 0 DGT FGA
LINEATTR	0 1FR NONE NT NSCR 0 213 P771 L213 TSPS 14 NIL LATA0 0 NIL (LCABILL) \$
STDPRTCT	P771 ( 11) ( 0)
STDPRTCT .STDPRT	20 90 N NP 0 NA
HNPACONT	213 65 1 ( 18) ( 5) ( 0) ( 0)
HNPACONT. HNPACODE	771 771 DN 213 771
TOFCNAME	213 771
DNINV	213 771 1145 L 00 1 17 23
LENLINES	HOST 00 1 17 23 S 1 7711145 DT 0 DGT CWT

**Description of translations progression (terminating)**

The earlier translations flow as follows.

- Inter-LATA carrier line (213) 771-1222 dials 771-1145.
- The LEN of the calling party determines the table LENLINES index.
- Table LINEATTR is indexed from table LENLINES with the Line attribute index number.
- From table LINEATTR, the translations transfer to table STDPRTCT with the Pretranslator name specified in table LINEATTR.
- From table STDPRTCT, translations index in subtable STDPRT with the leading digits dialed (771). The tuple associated with this number sets the call type as No prefix (NP) or local. This tuple routes the call to table HNPACONT with an N and NA selector. This tuple indicates that the number dialed does not include a prefix digit (0 or 1).

**Note:** Subtable STDPRT is checked. The tuple (6221176) is not found. The table is ignored.

- From subtable STDPRT, translations index in table HNPACONT with the area code of the calling line (213).

## Feature Group A - AMA (continued)

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- Subtable HNPACODE is indexed from table HNPACONT with the leading digits dialed (771). The tuple associated with this NXX specifies a DN selector. The DN selector provides an area code for the number dialed and routes the call to table TOFCNAME.
- Table TOFCNAME is indexed with the area code and NXX that subtable HNPACODE provides.
- From table TOFCNAME, table DNINV is indexed with the area code, NXX and last four digits of the number dialed. The last four digits are the DEFG digits. The tuple associated with the number dialed indicates that the tuple is part of a hunt group.
- Translations continue to LENLINES and connect to the line dialed.

*Note:* The long-distance number coded in the originating IC is the line the terminating IC dials.

## Limits

The following limits apply to Feature Group A - AMA:

- Feature BR0520 allows the system to generate an AMA record for the calls that terminate to a specified line. This ability allows the system to generate an AMA record for an originating FGA call. This feature is compatible with Bellcore AMA record formats.
- The following feature options are not compatible with TRMBOPT:
  - DTM   denied termination
  - CF     IBN call forwarding
- BR0520 is not compatible with trunks of any type, including PBX trunks.
- BR0520 is optional for each hunt group. This selection means that you must add an office that has package NTX083AA, TRMBOPT to the pilot DN of the hunt group.
- The Service Order system (SERVORD) allows the addition of TRMBOPT to a hunt group when package NTX083AA is not present.
- BR0768 allows the system to generate an AMA record for a terminating FGA call. This feature is compatible with Bellcore AMA record format.
- The terminating FGA line option (FGA) is limited to POTS lines with the following line class codes:
  - 1FR single party, flat rate.
  - 1MR single party, metered rate.

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**Feature Group A - AMA** (continued)

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**Interactions**

Feature Group A - AMA does not have functionality interactions.

**Activation/deactivation by the end user**

Feature Group A - AMA does not require activation or deactivation by the end user.

**Billing**

A Bellcore AMA format record identifies each type of call by a call code. A call code of 131 associates with originating FGA calls. This information is in Field 1 of the AMA record, after the structure code

Each call code can use a number of different structure codes. The attributes of the call determine the type of structure code. The definition of a structure code occurs for each recognized call code. Each structure code defines the set of data fields that comprise the billing record and field order.

The following structure codes associate with a call code of 131:

0079 answered call

0080 unanswered call

0179 long duration

**Note 1:** The definition of long-duration calls are calls that connect through a minimum of two midnights in a row.

**Note 2:** The system can generate call code 131 when the switch forwards a call through a line assigned with line option TRMBOPT.

BR0768 allows the system to generate an AMA record for terminating FGA calls. This feature is compatible with Bellcore AMA record format. A call code of 132 associates with terminating FGA calls. The call code information is in Field 1 of the AMA record, after the structure ID code.

The structure codes that can associate with a call code of 132 include the following items:

00500 high runner-answered

00001 answered

00101 long duration

## Feature Group A - AMA (continued)

00625 inter-LATA

### Station Message Detail Recording

Feature Group A - AMA does not affect Station Message Detail Recording.

### Datafilling office parameters

The office parameters that Feature Group A - AMA uses appears in the following table. Refer to the *Office Parameters Reference Manual* for additional information about office parameters.

#### Office parameters that are used by Feature Group A - AMA

Table nameParameter	Explanation and action
OFCENG	This parameter defines the translations environment of the switch. Set the value to North_American to limit the correct datafill to the North American dialing plan.
ACTIVE_DN_SYSTEM	

### Datafill sequence

A list of the tables that require datafill to implement Feature Group A - AMA appears in the following table. The tables appear in the correct entry order.

#### Datafill requirements for Feature Group A - AMA

Table	Purpose of table
HNPACONT	List of home number plan area (HNPA) Code Subtables Table. Lists the home or serving NPA and STS.
HNPACONT. HNPACODE	HNPA CODE Subtable. Lists the route, treatment, or table to which translations must route for each three-digit SNPA or STS that table HNPACONT defines.
TOFCNAME	Terminating Office Name Table. Lists all the correct terminating offices in the switch. A terminating office is a different group of area code and office code. The area code must be previously defined through table HNPACONT or SNPANAME.
LINEATTR	Line Attribute Table. Provides a list of attributes that associate with the line index assigned to each subscriber line.
HUNTGRP	Hunt Group Table. Defines the hunt groups that associate with an office.
LENLINES	Line Assignment Table. Contains information about LENs, the associated DN, and options that apply to those lines.
HUNTMEM	Hunt Group Member Table. Lists the members assigned to the hunt groups that table HUNTGRP lists.



**Feature Group A - AMA (continued)**

**Datafilling table HNPACONT**

Datafill for Feature Group A - AMA for table HNPACONT appears in the following table. The fields that apply to Feature Group A - AMA appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table HNPACONT**

Field	Subfield or refinement	Entry	Explanation and action
NPA (or STS in some loads)		alphanumeric	Serving translation scheme. Enter the three-digit SNPA or STS code.
NORTREFS		1 to 1023	Number of route references. Enter the number of the route references. The system extends field NORTREFS to the highest route index in subtable HNPACONT.RTEREF.
NOAMBIGC		0 to 1000	Number of ambiguous codes. Enter the number of ambiguous codes required, from 0 to 1000.

**Datafill example for table HNPACONT**

Sample datafill for table HNPACONT appears in the following example.

**MAP example for table HNPACONT**

NPA	NORTREFS	NOAMBIGC	RTEREF	HNPACODE	ATTRIB	RTEMAP
819	128	1	( 16 )	( 1 )	( 0 )	( 0 )

**Datafilling subtable HNPACODE**

Datafill for Feature Group A - AMA for table HNPACODE appears in the following table. The fields that apply to Feature Group A - AMA appear in

**Feature Group A - AMA** (continued)

this table. See the data schema section of this document for a description of the other fields.

**Datafilling subtable HNPACODE**

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		alphanumeric	From digits. Enter a numeric string where the leading three digits represent an office code in the home NPA. This number can represent a single code or the first in a block of subsequent codes with the same input data.
TODIGS		alphanumeric	To digits. When field FROMDIGS represents a single code, enter the same single code as in FROMDIGS.  When field FROMDIGS represents the first number of a block of subsequent numbers, enter the last number in the block.
CDRRTMT		see subfield	Code type, route reference and treatment. This field contains the subfields CD and RR. Descriptions of these subfields follow.
	CD	LRTE	Code type. Enter LRTE for local route.
	RR	1 to 1023	Route reference index. Enter the route reference index (1 to 1023) of the route list in subtable HNPACONT.RTEREF. Enter this index at the same position SNPA as this subtable HNPACONT.HNPACODE, to which translation is to proceed.

**Datafill example for subtable HNPACODE**

Sample datafill for subtable HNPACODE appears in the following example.

**MAP example for subtable HNPACODE**

FROMDIGS	TODIGS		
	CDRRTMT		
<hr/>			
622	622		
	LRTE	38	

**Feature Group A - AMA** (continued)

**Datafilling table TOFCNAME**

Datafill for Feature Group A - AMA for table TOFCNAME appears in the following table. The fields that apply to Feature Group A - AMA appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table TOFCNAME**

Field	Subfield or refinement	Entry	Explanation and action
AREACODE		alpha	Area code. Enter the area code in which the terminating office (TOFC) resides.
OFCCODE		alphanumeric	Office code. Enter the office code.
			<b>Note:</b> A number cannot be an AREACODE and OFCCODE. For example, when 613 is an AREACODE, the number cannot be an OFCCODE in an AREACODE.

The addition and deletion of tuples from this table can occur. The system does not deallocate the store when the store is allocated.

**Datafill example for table TOFCNAME**

Sample datafill for table TOFCNAME appears in the following example.

**MAP example for table TOFCNAME**

AREACODE	OFCCODE
-----	-----
613	621

**Note:** Do not use the same OFCCODE in two different area codes. For example, 613 849 and 819 849. The system does not control this limit.

**Datafilling table LINEATTR**

Datafill for Feature Group A - AMA for table LINEATTR appears in the following table. The fields that apply to Feature Group A - AMA appear in

**Feature Group A - AMA** (continued)

this table. See the data schema section of this document for a description of the other fields.

**Datafilling table LINEATTR (Sheet 1 of 5)**

Field	Subfield or refinement	Entry	Explanation and action
LNATTIDX		0 to 31 999	Line attribute index. Enter the line attribute index number.
LCC		alphanumeric	Line class code. Enter the line class code assigned to the line attribute index. You cannot change the LCC of a current tuple.
CHGCLSS		NONE	Charge class. When the arrangement of a switching unit is for local automatic message accounting (LAMA), enter the charge class assigned to the line attribute index.  When this condition does not apply, enter NONE.
COST		HI, LO, NT	Class of service tone. Enter the type of class of service tone required:  HI (High Tone)  LO (Low Tone)  NT (No Tone)
SCRNCL		NSCR	Class of service screening subtable name. When screening by class of service is required, enter the name of the class of service subtable. Enter the name of the subtable of service subtable that the operating company assigns to the line attribute index.  When screening is not required, enter NSCR.
LTG		0 to 9998	Line treatment group. Enter the line treatment group (0 to 9998) assigned to the line attribute index.
STS		alphanumeric	Serving translation scheme. Enter the serving NPA assigned to the line attribute index. You cannot change the STS of a current tuple.

**Feature Group A - AMA** (continued)

Datafilling table LINEATTR (Sheet 2 of 5)

Field	Subfield or refinement	Entry	Explanation and action
PRTNM		NPRT	Standard pretranslator subtranslator subtable name. When pretranslation of digits is required, enter the name of the Standard Pretranslator subtable assigned to the line attribute index.  When standard pretranslation is not required, enter NPRT.
LCANAME		NLCA	Local calling area screening subtable name. When screening of local NNX codes is required, enter the name of the local calling area subtable assigned to the line attribute index.  When screening is not required, enter NLCA
ZEROMPOS		NONE	Zero minus position. When the arrangement of a line attribute is for operator (0-) and special toll (0+) dialing, enter the position in the position table to which operator (0-) calls are routed.  When this condition does not apply, enter NONE.
TRAFSNO		0 to 127	Traffic separation number. Enter the source and destination traffic separation number (0 to 127) assigned to the line attribute index.
MRSA		alphanumeric or NIL	Message rate service area. Enter a message rate service area (MRSA) name when the Multi-Unit Message Rate (MUMR) feature is present. Table MRSANAME field MRSA knows the MRSA name. Enter the MRSA name when MUMR billing records are produced for calls to numbers with call type NP (no prefix).  Calls to numbers that result in a type of call other than NP result in normal DD or EA billing records. These calls do not cause MUMR records.  Enter NIL when MUMR billing records are not required.  <b>Note:</b> A line does not need to be a message rate as the line class code indicates to be a multi-unit message rate line.
SFC		NILSFC	International subscriber feature class. Enter NILSFC to satisfy the table editor.

**Feature Group A - AMA** (continued)

## Datafilling table LINEATTR (Sheet 3 of 5)

Field	Subfield or refinement	Entry	Explanation and action
LATANM		LATA	Local access and transport area name. Enter the name of the LATA that associates with this line attribute.
MDI		0	Metering data index, international switch only. Enter 0.
IXNAME		see subfield	International translations system start. This field has subfields XLASYS and XLANAME. Descriptions of these subfields follow.
	XLASYS	NIL	International translations system. Enter NIL to satisfy the table editor.
	XLANAME	see subfield	International translations name. When XLASYS is NIL, a prompt for this field is not available.
DGCLNAME		NIL	Digit analysis tables entry point. Enter NIL to satisfy the table editor.
FANIDIGS		00 to 99, B, C, D, E, F, or N or 00	Flexible ANI information digit pairs. In offices with the Flexible ANI Information Digit Assignment feature, enter the flexible ANI information digit pair (00 to 99). You can enter letters B, C, D, E, F, or N, that associate with this line attribute index.  When this condition does not apply, enter 00.
RESINF		see subfield	LCC (RES) information. This field has subfields RESINFO, CUSTGRP, SUBGRP, and NCOS. Descriptions of these subfields follow.

---

**Feature Group A - AMA** (continued)

---

Datafilling table LINEATTR (Sheet 4 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	RESINFO	Y or N	<p>LCC (RES) information selector. Enter Y when this line attribute index is required to support Residential Enhanced Services (RES) lines, and complete fields CUSTGRP, SUBGRP, and NCOS.</p> <p>The system can change a line with a line class code of 1FR, 1MR, OWT, EOW, INW, 2WW, or ETW to line class code of RES. This event occurs when the addition of an option from the Meridian Digital Centrex (MDC) custom calling feature set occurs.</p> <p>When this condition does not apply, enter N. A prompt is not present for fields CUSTGRP, SUBGRP, and NCOS.</p> <p><b>Note:</b> You can change field RESINFO from N to Y. You cannot change field RESINFO from Y to N.</p>
	CUSTGRP	alphanumeric	<p>LCC (RES) customer group. When RESINFO is Y, enter the customer group name to which LCC (RES) lines entered with this line attribute index belongs. Table CUSTENG field CUSTNAME knows the customer group name.</p> <p>When RESINFO is N, a prompt for this field is not available.</p> <p><b>Note:</b> Table editor commands cannot modify this field.</p>

## Feature Group A - AMA (continued)

### Datafilling table LINEATTR (Sheet 5 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	SUBGRP	0 to 7	<p>LCC (RES) customer subgroup. When RESINFO is Y, enter the subgroup (0 to 7) in the customer group to which LCC (RES) lines entered with this line attribute index belongs.</p> <p>When RESINFO is N, a prompt for this field is not available.</p> <p><b>Note:</b> Table editor commands cannot modify this field.</p>
	NCOS	0 to 511	<p>LCC (RES) network class of service number. When RESINFO is Y, enter the network class of service (NCOS) (0 to 511) in the customer group to which LCC (RES) lines entered with this line attribute index belongs.</p> <p>When RESINFO is N, a prompt for this field is not available.</p> <p><b>Note:</b> Table editor commands cannot modify this field.</p>

### Datafill example for table LINEATTR

Sample datafill for table LINEATTR appears in the following example.

### MAP example for table LINEATTR

```

LNATTIDX LCC CHGCLSS COST SCRNL LTG STS PRTNM LCANAME ZEROMPOS TRAF-
SNO
MRSA SFC LATANM MDI IXNAME DGCLNAME FANIDIGS
RESINF          OPTIONS
-----
O          1FR  NONE    NT   FR01  0   613  PRT1   NLCA NONE    10

NIL  NILSFC LATA1 0 NIL NIL 00
N $
    
```



---

## Feature Group A - AMA (continued)

---

For BCS34 and later versions, the removal of fields LCABILL and HOT in table LINEATTR occurs. These fields are current as options in the options field.

### Datafill sequence

A list of the tables that require datafill to implement Feature Group A - AMA appears in the following table. The tables appear in the correct entry order.

#### Datafill requirements for FGA Terminating Record (BR0768)

Table	Purpose of table
HNPACONT	List of HNPA Code Subtables. Lists the home or serving NPA and STS.
HNPACONT .HNPACODE	HNPA Code Subtable. Lists the route, treatment, or table to which translations must route for each three-digit SNPA or STS that table HNPACONT defines.
TOFCNAME	Terminating Office Name Table. Lists all the appropriate terminating offices in the switch. A terminating office is a different group of area code and office code. The area code must be defined through table HNPACONT or SNPANAME.
LINEATTR	Line Attribute Table. Provides a list of attributes that associate with the line index assigned to each subscriber line.
LENLINES	Line Assignment Table. Contains information about LENS, the associated DNs and options that apply to those lines.

### Datafilling table HNPACONT

Datafill for Feature Group A - AMA for table HNPACONT appears in the following table. The fields that apply to Feature Group A - AMA appear in this table. See the data schema section of this document for a description of the other fields.

#### Datafilling table HNPACONT (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
NPA (or STS in some loads)		alphanumeric (three digits)	Serving translation scheme. Enter the three-digit SNPA or STS code.

**Feature Group A - AMA** (continued)

Datafilling table HNPACONT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
NORTREFS		1 to 1023	Number of route references. Enter the number of the route references. The system extends field NORTREFS to the highest route index that subtable HNPACONT.RTEREF uses.
NOAMBIGC		0 to 159	Number of ambiguous codes. Enter the number of ambiguous codes required (from 0 to 159).

**Datafill example for table HNPACONT**

Sample datafill for table HNPACONT appears in the following example.

**MAP example for table HNPACONT**

```

NPA NORTREFS NOAMBIGC RTEREF  HNPACODE  ATTRIB RTEMAP
-----
819      128           1 ( 16) (      1) (    0) (    0)
    
```

**Feature Group A - AMA (continued)**

**Datafilling subtable HNPACODE**

Datafill for Feature Group A - AMA for table HNPACODE appears in the following table. The fields that apply to Feature Group A - AMA appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling subtable HNPACODE**

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric	From digits. Enter a numeric string where the leading three digits represent an office code in the home NPA. This number can represent a single code or the first in a block of appropriate codes with the same input data.
TODIGS		numeric	To digits. When field FROMDIGS represents a single code, enter the same single code as in FROMDIGS.  When field FROMDIGS represents the first number of a block of appropriate numbers, enter the last number in the block.
CDRRTMT		see subfield	Code type, route reference and treatment. This field has the subfields CD and RR. Descriptions of these subfields follow.
	CD	LRTE	Code type. Enter LRTE for local route.
	RR	1 to 1023	Route reference index. Enter the route reference index (1 to 1023) of the route list in subtable HNPACONT.RTEREF. Enter this data at the same position SNPA as this subtable HNPACONT.HNPACODE, to which translation is to proceed.

**Datafill example for subtable HNPACODE**

Sample datafill for subtable HNPACODE appears in the following example.

**MAP example for subtable HNPACODE**

FROMDIGS	TODIGS
	CDRRTMT
622	622
	LRTE 38

## Feature Group A - AMA (continued)

### Datafilling table TOFCNAME

Datafill for Feature Group A - AMA for table TOFCNAME appears in the following table. The fields that apply to Feature Group A - AMA appear in this table. See the data schema section of this document for a description of the other fields.

#### How to enter data into table TOFCNAME

Field	Subfield or refinement	Entry	Explanation and action
AREACODE		numeric	Area code. Enter the area code in which the TOFC resides.
OFCCODE		alphanumeric	Office code. Enter the office code.
			<b>Note:</b> A number cannot be an AREACODE and OFCCODE. For example, when 613 is an AREACODE, 613 cannot be an OFCCODE in an AREACODE.

The addition and deletion of tuples from this table can occur. The system does not deallocate the system store when the system store is allocated.

#### Datafill example for table TOFCNAME

Sample datafill for table TOFCNAME appears in the following example.

#### MAP example for table TOFCNAME

AREACODE	OFCCODE
819	622

**Note:** Do not use the same OFCCODE in two different area codes. For example, 613 849 and 819 849. The system does not enforce this limit

**Feature Group A - AMA** (continued)**Datafilling table LINEATTR**

Datafill for Feature Group A - AMA for table LINEATTR appears in the following table. The fields that apply to Feature Group A - AMA appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table LINEATTR (Sheet 1 of 5)**

Field	Subfield or refinement	Entry	Explanation and action
LNATTIDX		0 to 4095	Line attribute index. Enter the line attribute index number.
LCC		1FR	Line class code. Enter 1FR.
CHGCLSS		NONE	Charge class. When the arrangement of a switching unit is for LAMA, enter the charge class assigned to the line attribute index.  When this condition does not apply, enter NONE.
COST		HI, LO, NT	Class of service tone. Enter the type of class of service tone required:  HI (High Tone)  LO (Low Tone)  NT (No Tone)
SCRNCL		NSCR	Class of service screening subtable name. When screening by class of service is required, enter the name of the class of service subtable. Enter the name of the class of service subtable that the operating company assigns to the line attribute index.  When screening is not required, enter NSCR.
LTG		0 to 511	Line treatment group. Enter the line treatment group (0 to 511) assigned to the line attribute index.
STS		see subfield	Serving translation scheme. Enter the serving NPA assigned to the line attribute index. The STS of a current tuple cannot change.

**Feature Group A - AMA** (continued)

Datafilling table LINEATTR (Sheet 2 of 5)

Field	Subfield or refinement	Entry	Explanation and action
PRTNM		NPRT	Standard pretranslator subtable name. When pretranslation of digits is required, enter the name of the Standard Pretranslator subtable assigned to the line attribute index.  When standard pretranslation is not required, enter NPRT.
LCANAME		NLCA	Local calling area screening subtable name. When screening of local NNX codes is required, enter the name of the local calling area subtable assigned to the line attribute index.  When screening is not required, enter NLCA
ZEROMPOS		NONE	Zero minus position. When the arrangement of a line attribute is for operator (0-) and special toll (0+) dialing, enter the position in the position table to which the system routes operator (0-) calls.  When this condition does not apply, enter NONE.
TRAFSNO		0 to 127	Traffic separation number. Enter the source and destination traffic separation number (0 to 127) assigned to the line attribute index.
MRSA		alphanumeric or NIL	Message rate service area. Enter an MRSA name when the MUMR feature is present. Table MRSANAME field MRSA knows the MRSA name. Enter the MRSA name when MUMR billing records are produced for calls to numbers with call type NP.  Calls to numbers that result in a type of call other than NP result in normal DD or EA billing records. These calls do not cause MUMR records.  Enter NIL if MUMR billing records are not required.  <b>Note:</b> Calls to numbers that result in a type of call other than NP result in standard DD or EA billing records. These calls do not cause MUMR records.
SFC		NILSFC	International subscriber feature class. Enter NILSFC to satisfy the table editor.

**Feature Group A - AMA** (continued)

Datafilling table LINEATTR (Sheet 3 of 5)

Field	Subfield or refinement	Entry	Explanation and action
LATANM		LATA	Local access and transport area name. Enter the name of the LATA that associates with this line attribute.
MDI		0	Metering data index (international switch only). Enter 0.
IXNAME		see subfield	International translations system start. This field contains subfields XLASYS and XLANAME. Descriptions of these subfields follow.
	XLASYS	NIL	International translations system. Enter NIL to satisfy the table editor.
	XLANAME	see subfield	International translations name. When XLASYS is NIL, a prompt for this field is not available.
DGCLNAME		NIL	Digit analysis tables entry point. Enter NIL to satisfy the table editor.
FANIDIGS		00 to 99 or B, C, D, E, F, or N	Flexible ANI information digit pair. In offices with the Flexible ANI Information Digit Assignment feature, enter the flexible ANI information digit pair (00 to 99). You can enter letters B, C, D, E, F, or N, that associate with this line attribute index.  When this condition does not apply, enter 00.
RESINF		see subfield	LCC (RES) information. This field contains subfields RESINFO, CUSTGRP, SUBGRP, and NCOS. Descriptions of these subfields follow.

**Feature Group A - AMA** (continued)

Datafilling table LINEATTR (Sheet 4 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	RESINFO	Y or N	<p>LCC (RES) information selector. Enter Y when this line attribute index is required to support Residential Enhanced Services (RES) lines. Complete fields CUSTGRP, SUBGRP, and NCOS.</p> <p>The system can change a line with a line class code of 1FR, 1MR, OWT, EOW, INW, 2WW, or ETW to line class code of RES. This event occurs during the addition of an option from the MDC custom calling feature set.</p> <p>When this condition does not apply, enter N. A prompt for fields CUSTGRP, SUBGRP, and NCOS is not present.</p> <p><b>Note:</b> You can change field RESINFO from N to Y. You cannot change field RESINFO from Y to N.</p>
	CUSTGRP	Y or N	<p>LCC (RES) customer group. When RESINFO is Y, enter the customer group name to which LCC (RES) lines entered with this line attribute index belong. Table CUSTENG field CUSTNAME knows the customer group name.</p> <p>When RESINFO is N, a prompt for this field is not available.</p> <p><b>Note:</b> Table editor commands cannot modify this field.</p>



**Feature Group A - AMA** (continued)

Datafilling table LINEATTR (Sheet 5 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	SUBGRP	numeric (0 to 7)	LCC(RES) customer subgroup. When RESINFO is Y, enter the subgroup (0 to 7) in the customer group to which LCC (RES) lines entered with this line attribute index belong.  When RESINFO is N, a prompt for this field is not available.  <b>Note:</b> Table editor commands cannot modify this field.
	NCOS	numeric (0 to 511)	LCC (RES) network class of service number. When RESINFO is Y, enter the network class of service (NCOS) (0 to 511) in the customer group to which LCC (RES) lines entered with this line attribute index belong.  When RESINFO is N, a prompt for this field is not available  <b>Note:</b> Table editor commands cannot modify this field.

**Datafill example for table LINEATTR**

Sample datafill for table LINEATTR appears in the following example.

**MAP example for table LINEATTR**

```

LNATTIDX LCC CHGCLSS COST SCRNL LG STS PRTNM LCA NAME
ZEROMPOS TRAFSNO
M RSA SFC LATANM MDI IXNAME DGCLNAME FANIDIGS
RESINF OPTIONS
-----
0 1FR NONE NT FR01 0 613 NPRT NLCA
NONE 10
NIL NILSFC LATA1 0 NIL NIL 00
N $
    
```

For BCS34 and later releases, the removal of fields LCABILL and HOT in table LINEATTR occurs. These fields are current as options in the options field.

## Feature Group A - AMA (continued)

### Tools for verifying translations

Feature Group A - AMA does not use tools for verifying translations.

### SERVORD

Use **SERVORD** to invoke the Billing on Terminating Billing Calls to a Line feature. Add and delete the FGA Terminating Record feature from a line through the use of **SERVORD**.

#### SERVORD limits

The following **SERVORD** limits apply to Feature Group A - AMA:

- **SERVORD** accepts **TRMBOPT** for the pilot DN of a hunt group.
- **SERVORD** allows the addition of **TRMBOPT** to a hunt group. This addition can occur when the office does not feature package **NTX083AA**.
- Unless feature package **NTX083AA** is present and **TRMBOPT** is assigned to the pilot DN of the hunt group, the system does not generate an **AMA** record.

#### SERVORD prompts

The **SERVORD** prompts that assign the Billing on Terminating Calls to a Line feature to the pilot DN of a hunt group appear in the following table.

##### SERVORD prompts for Billing on Terminating Calls to a Line

Prompt	Valid input	Explanation
DN_OR_LEN	Valid DN or LEN	Enter the seven-digit DN or the LEN.
OPTION	TRMBOPT	Enter TRMBOPT to assign the terminating billing option to the pilot DN of the hunt group.

The **SERVORD** prompts that assign the FGA feature to a line appear in the following table.

##### SERVORD prompts for Feature Group A - AMA

Prompt	Valid input	Explanation
DN_OR_LEN	Valid DN or LEN	Enter the seven-digit directory number or enter the LEN.
OPTION	FGA	Enter FGA to assign Terminating FGA Option to a line.

---

**Feature Group A - AMA** (continued)

---

To add the Billing on Terminating Calls to a Line feature to the pilot DN of a hunt group with the ADO command appears in the following SERVORD example.

**SERVORD example for Setting up Billing on Terminating Calls to a Line with the ADO command in prompt mode**

```
> SERVORD
SO:
> ADO
SONUMBER: NOW 91 8 4 AM
>
DN_OR_LEN:
> 6211176
OPTION:
> TRMBOPT
OPTION:
> $
COMMAND AS ENTERED:
ADO NOW 91 8 4 AM 6211176 (TRMBOPT) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y
```

**SERVORD example for Setting up Billing on Terminating Calls to a Line with the ADO command in no-prompt mode**

```
> ADO $ 6211176 TRMBOPT $
```

The addition of the FGA Terminating Record feature to a line with the ADO command appears in the following SERVORD example.

## Feature Group A - AMA (end)

---

### SERVORD example for Setting up FGA Terminating Record with the ADO command in prompt mode

```
> SERVORD
SO:
> ADO
SONUMBER: NOW 91 8 4 AM
>
DN_OR_LEN:
> 6211177
OPTION:
> FGA
OPTION:
> $
COMMAND AS ENTERED:
ADO NOW 91 8 4 AM 6211177 (FGA) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y
```

### SERVORD example for Setting up FGA Terminating Record with the ADO command in no-prompt mode

```
> ADO $ 6211177 FGA $
```

---

## Feature Group A - EQAC

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS23 and later versions

### Requirements

Feature Group A - EQAC does not have requirements.

### Description

Interexchange carriers (IEC) can choose to connect IEC facilities to operating company networks through feature groups. The earliest and simplest of these procedures is Feature Group A (FGA). The FGA provides line-side access from an end office to an IEC. To gain FGA access to the IEC, a subscriber dials a local seven-digit directory number (DN). This DN is assigned to that carrier.

The Feature Group A - EQAC (Equal Access) feature package allows the end office to generate automatic message accounting (AMA) records. The end office must generate AMA records when a subscriber originates a call to an FGA carrier. The end office can generate AMA records when an FGA carrier terminates a call to an end office.

### Operation

An FGA call can be viewed in two stages: the originating and the terminating part of the call. The originating part of an FGA call occurs between a subscriber and an FGA carrier. The terminating part of an FGA call occurs between an FGA carrier and the called party.

An FGA call has three possibilities:

- A call can be FGA originating (FGA lines between the originating end office and the IEC). A call can be FGA terminating (FGA lines between the IEC and the terminating end office).
- A call can be FGA originating, but use one of several feature groups between the IEC and the terminating end office. These groups are feature group B (FGB), feature group C (FGC), or feature group D (FGD) trunks.
- A call can use FGB, FGC, or FGD trunks between the originating end office and the IEC. The call can be FGA terminating. The IEC is the originating part of the call.

## **Feature Group A - EQAC** (continued)

---

This feature package includes the following two features:

- FGA originating record
- FGA terminating record

### **FGA originating record**

This feature allows the end office to generate an AMA record for an originating FGA call. This feature is compatible with Northern Telecom and Bellcore AMA record formats.

The ability to produce an AMA record for an originating FGA call occurs through hunt groups. The FGA lines in the originating end office are set up as a hunt group.

The terminating billing option (TRMBOPT) is assigned in table HUNTGRP to the pilot DN of the hunt group. A subscriber can make a call to a member of a hunt group with option TRMBOPT. When a subscriber makes a call, the end office generates an AMA record (code 131).

### **FGA terminating record**

This feature allows the end office to generate an AMA record for a terminating FGA call. This feature is compatible with Bellcore AMA record format. The system implements this feature as a line option.

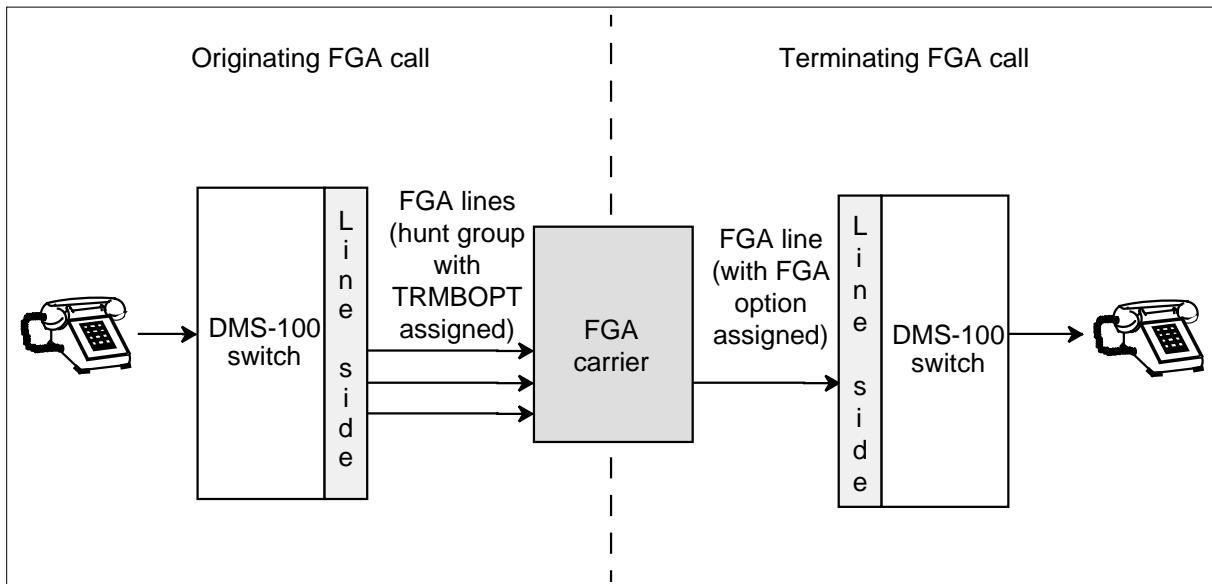
Definition of a terminating FGA line occurs through the assignment of option FGA to this line in table LENLINES. This option is assigned in the terminating end office. A subscriber can make a call from an FGA carrier to the terminating end office. When a subscriber makes a call, the end office generates an AMA record (code 132).

A simple originating and terminating FGA call appears in the following figure.

---

**Feature Group A - EQAC (continued)**


---

**Originating and terminating FGA call****Translations table flow**

Descriptions of the Feature Group A - EQAC translations tables appear in the following list:

- Table LENLINES (Line Assignment) contains the hardware assignments of working lines and assigned options. The line equipment number (LEN) of the calling party determines how the system indexes this table. This table provides the line attribute index that the system uses to access table LINEATTR.
- Table LINEATTR (Line Attribute) determines the indexing for screening tables. This table first defines the type of line that generates the call. This table provides the pretranslator name that the system uses to access table STDPRTCT.
- Table STDPRTCT (List of Standard Pretranslations) sets the type of call that the system processes. This table performs other functions that relate to the way the system routes and screens calls.
- Subtable HNPACONT.HNPACODE (Home NPA Code) lists the route, treatment, or table to which the system must route translations. The system must route translations for each three-digit serving numbering plan area (SNPA) or STS that table HNPACONT defines. A code type is assigned to each code that table HNPACONT defines. A code type of DN must be assigned to the FGA line. The system uses the DN selector with lines that terminate in the end office.

## Feature Group A - EQAC (continued)

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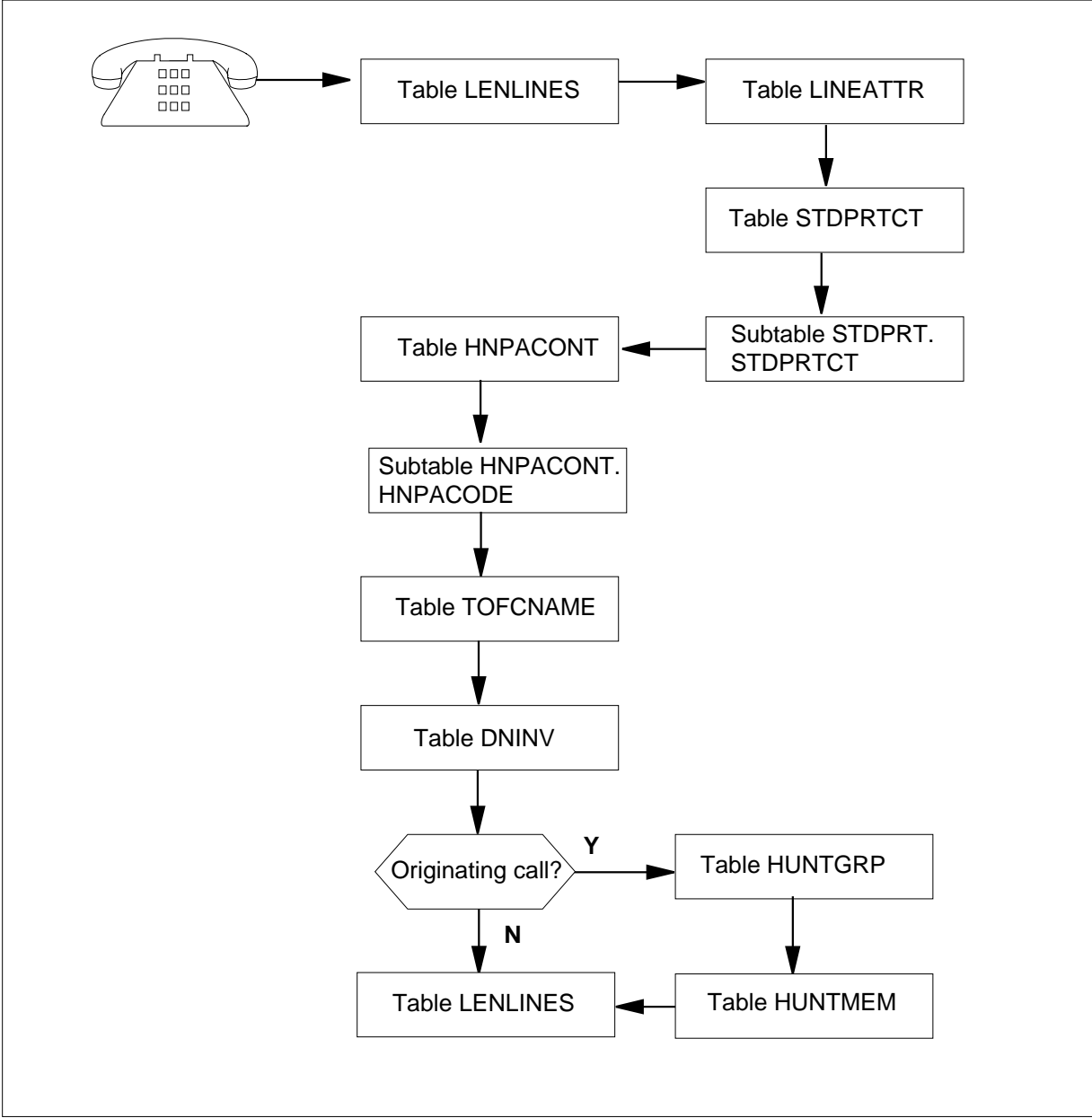
- Table TOFCNAME (Terminating Office Name) defines the terminating offices in the switch. A terminating office is a group of area code and office code.
- Table DNINV (DN Inventory) lists every D in the switch as well as relevant information. This important information includes which LEN or hunt group each DN is assigned. This table is read-only.
- Table HUNTGRP (Hunt Group) defines the hunt groups that associate with an office. This table defines the FGA carrier hunt group, that the system uses for originating FGA calls. The telephone company must bill an originating FGA call correctly. Option TRMBOPT must be assigned to the pilot DN of the FGA carrier hunt group.
- Table HUNTMEM (Hunt Group Member) lists the members assigned to the hunt groups that appear in table HUNTGRP. The system uses this table for originating FGA calls.

The Feature Group A - EQAC translation process appears in the following flowchart.



**Feature Group A - EQAC** (continued)

Table flow for Feature Group A - EQAC



**Feature Group A - EQAC** (continued)

The datafill content used in the flowchart appears in the following example. The calling number is (613) 622-1177, the called number is 622-1176, and the call code is 131.

**Datafill example for Feature Group A - EQAC**

Datafill table	Example data
LENLINES	HOST 00 0 00 2 S 0 6221177 DT 0 DGT
LINEATTR	0 1FR NONE NT FR01 0 613 PRT1 L613 Y TSPS N 10 NIL LATA2 0 NIL
STDPRTCT	PRT1 ( 1) ( 1)
STDPRTCT .STDPRT	50 60 N NP 0 NA
HNPACONT	613 128 1 ( 16) ( 1) ( 0) ( 0)
HNPACONT .HNPACODE	622 622 DN 613 622
TOFCNAME	613 622
DNINV	613 622 1176 H 0 01
HUNTGRP	0 613 6211176 DNH N N Y RCVD N N N N 10
HUNTMEM	0 1 N D 6211176 N

A description of the previous translations flow appears in the following list:

1. Line (613) 622-1177 dials 622-1176 to access an IEC.
2. Table LENLINES—the LEN (HOST 00 0 00 2) of the calling party determines how the system indexes this table.
3. Table LINEATTR—the system indexes this table from table LENLINES with the line attribute index number (0).
4. From table LINEATTR, the translations move to table STDPRTCT through the pretranslator name (PRT1) in table LINEATTR.
5. From table STDPRTCT, translations index subtable STDPRTCT.STDPRT through the leading digits that the subscriber dials (622). The tuple that associates with this number sets the call type as no prefix (NP) or local. The tuple routes the call to table HNPACONT with

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## Feature Group A - EQAC (continued)

---

an N and NA selector. The tuple indicates that the number that the subscriber dials does not include a prefix digit (0 or 1).

*Note:* Subtable STDPRTCT.AMAPRT—the system checks this subtable, but does not find the tuple (6221176). The system ignores the table.

6. From subtable STDPRTCT.STDPRT, translations index for table HNPACONT through the area code of the calling line (613).
7. Subtable HNPACONT.HNPACODE—the system indexes this subtable from table HNPACONT through the leading digits dialed (622). The tuple that associates with this number gives a DN selector. The DN selector provides an area code for the number that the subscriber dials. The DN routes the call to table TOFCNAME.
8. Table TOFCNAME—the system indexes this table through the area code and NXX that subtable HNPACONT.HNPACODE provides.
9. From table TOFCNAME, the system indexes table DNINV through:
  - the area code
  - the NXX
  - the last four digits of the number that the subscriber dials

The tuple that associates with the number dialed indicates that the tuple is part of a hunt group.
10. In table HUNTGRP, the system indexes the appropriate tuple through the hunt group number that table DNINV provides. The tuple provides information about the hunt group. For this feature, field TRMBOPT is set to Y which generates an AMA call code of 131.
11. Table HUNTMEM—the system indexes this table through the hunt group number and the member number that table DNINV provides. The tuple that associates with this table gives information about the member.
12. Translations continue to LENLINES and connect to the IEC. The carrier returns the dial tone to the subscriber. The subscriber enters the appropriate codes and the long-distance number desired.

### Description of translations progression (call termination)

The datafill content used in the flowchart appear in the following example. A description of the second stage of the call (termination) is available. The

**Feature Group A - EQAC** (continued)

calling number is (213)771-1222, the called number is 771-1145, and the call code is 132.

**Datafill example for Feature Group A - EQAC (termination)**

Datafill table	Example data
LENLINES	HOST 00 0 01 24 S 0 7711222 DT 0 DGT FGA
LINEATTR	0 1FR NONE NT NSCR 0 213 P771 L213 Y TSPS N 14 NIL LATA0 0 NIL
STDPRTCT	P771 ( 11) ( 0)
STDPRTCT.STDPRT	20 90 N NP 0 NA
HNPACONT	213 65 1 ( 18) ( 5) ( 0) ( 0)
HNPACONT.HNPACODE	771 771 DN 213 771
TOFCNAME	213 771
DNINV	213 771 1145 L 00 1 17 23
LENLINES	HOST 00 1 17 23 S 1 7711145 DT 0 DGT CWT

The previous translations flow is as follows:

1. The inter-LATA carrier line (213) 771-1222 dials 771-1145, the number of the called party.
2. Table LENLINES—the LEN (HOST 00 0 01 24) of the calling party determines how the system indexes this table.
3. Table LINEATTR—the system indexes this table from table LENLINES with the line attribute index number (0).
4. From table LINEATTR, the translations move to table STDPRTCT through the pretranslator name (P771) that appears in table LINEATTR.
5. From table STDPRTCT, translations index into subtable STDPRTCT.STDPRT through the leading digits that the subscriber dials (771). The tuple that associates with this number sets the call type as no prefix (NP) or local. The tuple routes the call to table HNPACONT with

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## Feature Group A - EQAC (continued)

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an N and NA selector. The tuple indicates that the number that the subscriber dials does not include a prefix digit (0 or 1).

*Note:* Subtable STDPRTCT.AMAPRT—the system checks this subtable. The system does not find the tuple (6221176). The system ignores the table.

6. From subtable STDPRTCT.STDPRT, translations index into table HNPACONT through the area code of the calling line (213).
7. Subtable HNPACONT.HNPACODE—the system indexes this subtable from table HNPACONT through the leading digits that the subscriber dials (771). The tuple that associates with this NXX gives a DN selector. The DN selector provides an area code for the number dialed. The DN selector routes the call to table TOFCNAME.
8. Table TOFCNAME—the system indexes this table through the area code and NXX that subtable HNPACONT.HNPACODE provides.
9. From table TOFCNAME, the system indexes table DNINV through:
  - the area code
  - the NXX
  - the last four digits of the number that the subscriber dials

The tuple associated with the number dialed indicates that it is not part of a hunt group.
10. Translations continue to LENLINES and connect to the line that the subscriber dials.

### Limits

The following limits apply to Feature Group A - EQAC:

- The following feature options are not compatible with option TRMBOPT:
  - denied termination (DTM)
  - MDC call forwarding (CFX)
  - POTS call forwarding (CFW)
- This feature is not compatible with trunks, like private branch exchange (PBX) trunks.
- This feature is optional for each hunt group. Even when an office purchases package NTX083AA, the system must add option TRMBOPT to the pilot DN of the hunt group.
- The SERVORD allows the addition of option TRMBOPT to a hunt group even if an office did not purchase package NTX083AA. If an office

## Feature Group A - EQAC (continued)

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purchases feature package NTX083AA and option TRMBOPT is assigned to the pilot DN of the hunt group, this feature functions.

The following limits apply to the FGA terminating record feature:

- The AMA billing records that this feature generates are restricted to Bellcore format.
- The FGA line option is limited to POTS lines with the following line class codes:
  - 1FR—single party, flat rate
  - 1MR—single party, message rate

## Interactions

The following paragraphs describe the interactions between Feature Group A - EQAC and other functionalities.

- 1FR—single party, flat rate
- 1MR—single party, metered rate
- PBX—private branch exchange
- PBM—PBX message register
- MDC—Meridian Digital Centrex

The following line options are compatible with the terminating FGA option:

- CLI—calling line identification
- SHU—stop hunt
- RSUS—requested suspension
- SLU—subscriber line usage
- SDY—line studies
- DOR—denied originating service
- DTM—denied terminating service
- Lcdr—local call detail recording
- CLF—malicious call hold
- NLT—no line insulation test
- NOH—no receiver off hook tone
- SUS—suspended service

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## Feature Group A - EQAC (continued)

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- DGT—Digitone
- PIC—primary inter-LATA carrier

### Activation/deactivation by the end user

Feature Group A - EQAC does not require activation or deactivation by the end user.

### Billing

An FGA carrier that makes an inter-LATA call from a 1FR or a 1MR line normally produces one billing record with call code 110. The carrier can generate an additional Bellcore AMA record with call code 132.

### Station Message Detail Recording

Feature Group A - EQAC does not affect Station Message Detail Recording.

### Datafilling office parameters

Feature Group A - EQAC does not affect office parameters.

### Datafill sequence

The following table lists the tables that require datafill to implement Feature Group A - EQAC. The tables appear in the correct entry order.

**Note:** Production of a Bellcore format AMA record for an originating FGA call requires datafill. This datafill is like the datafill that the following table and paragraphs describe. Datafill is not required for table TOLLENTC when the system uses Bellcore AMA format records.

#### Datafill requirements for Feature Group A - EQAC

Table	Purpose of table
TOLLENTC	Table TOLLENTC (Entry Code). This table lists the entry code for each of the charge classes. These charge classes appear in table BILLCODE for incoming or two-way CAMA trunk groups and in table LINEATTR for lines.  <b>Note:</b> The system uses this table in offices that use Nortel AMA record format.
HUNTGRP	Table HUNTGRP (Hunt Group). This table defines the hunt groups that associate with an office. This table defines the FGA carrier hunt group.
LENLINES	Table LENLINES (Line Assignment). This table contains information about LENS and the associated DNs and options.

**Feature Group A - EQAC (continued)**

**Datafilling table TOLLENTC**

Table TOLLENTC lists the entry code for each of the charge classes that appears in table LINEATTR for lines. Charge class TRMB is used for local billable calls that terminate on a line that belongs to a hunt group. Enter data for FGA AMA originating records.

Datafill for Feature Group A - EQAC for table TOLLENTC appear in the following table. The fields that apply to Feature Group A - EQAC appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table TOLLENTC**

Field	Subfield or refinement	Entry	Description
CHGCLASS		TRMB	Charge class. Enter TRMB.
ECANDCHG		see subfields	Entry code and charge. This field contains the following subfields.
	ENTCODE	Entry code	Entry code. Enter the entry code (0 to 99) assigned to the charge class.
	APPLYCHG	Y or N	Apply charge. Enter Y to apply a charge for call. In other occurrences, enter N.

**Datafill example for table TOLLENTC**

Sample datafill for table TOLLENTC appear in the following example.

**MAP example for table TOLLENTC**

CHGCLASS	ECANDCHG	
TRMB	31	Y

**Datafilling table HUNTGRP**

Table HUNTGRP defines the hunt groups that associate with an office. This table defines the FGA carrier hunt group. Option TRMBOPT must be assigned to the pilot DN of the FGA carrier hunt group. Option TRMBOPT must be assigned to generate a billing record for an originating FGA call.

The datafill for Feature Group A - EQAC for table HUNTGRP appear in the following table. Fields that apply directly to Feature Group A - EQAC appear



**Feature Group A - EQAC** (continued)

in the table. See the data schema section of this document for a description of the other fields.

**Datafilling table HUNTGRP**

Field	Subfield or refinement	Entry	Description
TRMBOPT		Y or N	Terminating billing option. Enter Y if the end office must a record for each call to a member of the hunt group. In other occurrences, enter N.

**Datafill example for table HUNTGRP**

Sample datafill for table HUNTGRP appear in the following example.

**MAP example for table HUNTGRP**

HTGRP	SNPA	DN	GRPTYP	GRPDATA
0	619 5206100		DNH N N N	RCVD N
	N			N
				Y O
			N 1	\$

**Datafilling table LENLINES**

Table LENLINES contains information about LENs and the associated DNs and options. Line option FGA must be assigned to the terminating FGA lines.

Datafill for Feature Group A - EQAC for table LENLINES appears in the following table. The fields that apply to Feature Group A - EQAC appear in

## Feature Group A - EQAC (continued)

this table. See the data schema section of this document for a description of the other fields.

### Datafilling table LENLINES

Field	Subfield or refinement	Entry	Description
OPTLIST		Option list	<p>Option list. Enter a list of a maximum of 20 basic options which are assigned to the directory number.</p> <p>Assign the FGA line option to the FGA line between the IEC and the terminating end office.</p> <p>Assign the DOR (denied originating service) option to the pilot DN of the hunt group between the EAEO and the AT. Assign the DOR to prevent the origination of calls by the FGA carrier.</p>

### Datafill example for table LENLINES

Sample datafill for table LENLINES appears in the following example.

### MAP example for table LENLINES

LEN	PTY	RINGCODE	DN	SIGTYPE	LNATTIDX	OPTLIST
CRCS	00	0 00 00	S	0	5340100	
				DT	15	( CWT) ( FGA)\$

### Tools for verifying translations

Feature Group A - EQAC does not use tools for verifying translations.

### SERVORD

#### SERVORD limits

The Service Order System (SERVORD) must be the only method a user can use to assign option TRMBOPT. A user must use SERVORD to add the FGA option to and delete the option from a line.

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## Feature Group A - EQAC (continued)

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The following SERVORD limits apply to Feature Group A - EQAC:

- SERVORD accepts option TRMBOPT for the pilot DN of a hunt group.
- The SERVORD allows the addition of option TRMBOPT to a hunt group. The SERVORD allows the addition even if the office does not purchase feature package NTX083AA.
- An office must purchase feature package NTX083AA. Option TRMBOPT must be assigned to the pilot DN of the hunt group. When these actions occur, the end office generates an AMA record.

### SERVORD prompts

The SERVORD prompts that assign option TRMBOPT to the pilot DN of a hunt group appear in the following table.

#### SERVORD prompts for Feature Group A - EQAC

Prompt	Valid input	Description
DN_OR_ LEN	Valid DN or LEN	Enter the seven-digit DN or the LEN.
OPTION	TRMBOPT	Enter TRMBOPT to assign the option to the pilot directory number of the hunt group.

The SERVORD prompts that assign option FGA to a line appear in the following table.

#### SERVORD prompts for Feature Group A - EQAC

Prompt	Valid input	Description
DN_OR_ LEN	Valid DN or LEN	Enter the seven-digit DN or the LEN.
OPTION	FGA	Enter FGA to assign the option to a line.

### SERVORD example for the addition of Feature Group A - EQAC

A user can use the ADO (add option) command to add option TRMBOPT to the pilot DN of a hunt group. This process appears in the following SERVORD example.

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## Feature Group A - EQAC (end)

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### SERVORD example for Feature Group A - EQAC in prompt mode

```
> ADO
SONUMBER: NOW 91 8 4 AM
>
DN_OR_LEN:
> 6211176
OPTION:
> TRMBOPT
OPTION:
> $
```

### SERVORD example for Feature Group A - EQAC in no-prompt mode

```
>ADO $ 6211176 TRMBOPT $
```

A user can use the ADO command to add option FGA to a line. This process appears in the following SERVORD example.

### SERVORD example for Feature Group A - EQAC in prompt mode through the ADO command

```
> ADO
SONUMBER: 91 8 4 AM
>
DN_OR_LEN:
> 6211177
OPTION:
> FGA
OPTION:
> $
```

### SERVORD example for Feature Group A - EQAC in no-prompt mode through the ADO command

```
> ADO $ 6211177 FGA $
```

---

## Feature Group B - AMA End Office

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### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS34 and later versions

### Requirements

Feature Group B - AMA End Office does not have requirements.

### Description

The switch of an operating company routes calls that the subscriber places to a carrier. The switch bills the carrier for using operating company facilities. The operating company calculates the charges for the facilities. The operating company measures and records the call data associated with Feature Group B (FGB) calls to calculate the charges.

Feature Group B - AMA End Office allows the operating company to generate billing records for calls to FGB carriers. This feature makes sure that the carrier identification information in the billing records is correct.

Feature Group B - AMA End Office, with the correct trunking and translations, sets up an FGB access arrangement. Networks that support this arrangement allow local and toll offices (FGB end office) to provide subscriber access FGB carriers. Networks that support this arrangement allow FGB tandem carriers (FGBT) to provide subscriber access to FGB carriers. All offices that participate in the network accept FGB dialing (interim prefix) and Feature Group C (FGC) signaling (traditional). All subscribers that participate in the network must have dual-tone multifrequency (DTMF) phones. The DTMF telephones allow audio tones that represent the digits dialed to pass through the network to the carrier.

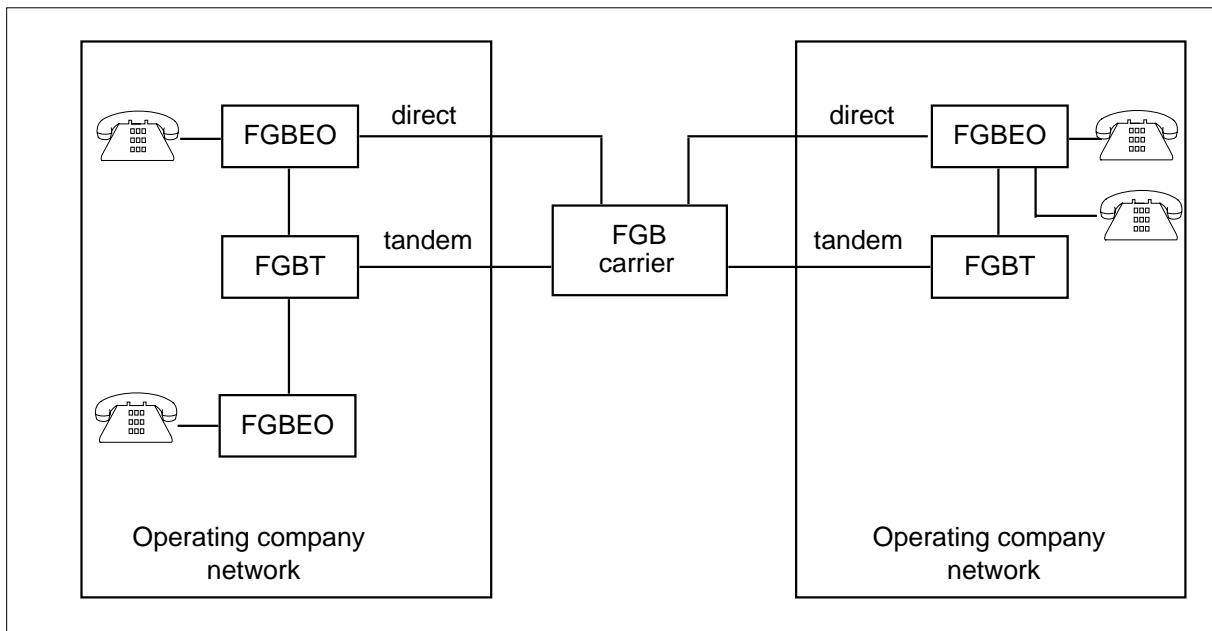
With FGB, a subscriber dials the interim prefix (950-WXXX) to access a carrier. The subscriber dials the prefix when the subscriber receives the first dial tone. The subscriber dials a carrier-defined authorization (AUTH) code and the called number. The called number is seven or ten digits. The subscriber dials the AUTH code when the subscriber receives the second dial tone.

**Note:** The XXX characters in the interim prefix represent the access code of the carrier for more information.

## Feature Group B - AMA End Office (continued)

The system outpulses the dialed digits on the line of the subscriber to an FGB end office (FGBEO). The FGBEO can have equal access (EA) software. The FGBEO outpulses the information from the subscriber to the FGB carrier. The trunk connection between the FGBEO and the FGB carrier is direct or tandem. A direct connection is FGBEO to FGB carrier. A tandem connection is FGBEO to FGBT to FGB carrier. The two types of connections appear in the following figure.

### Direct and tandem connections



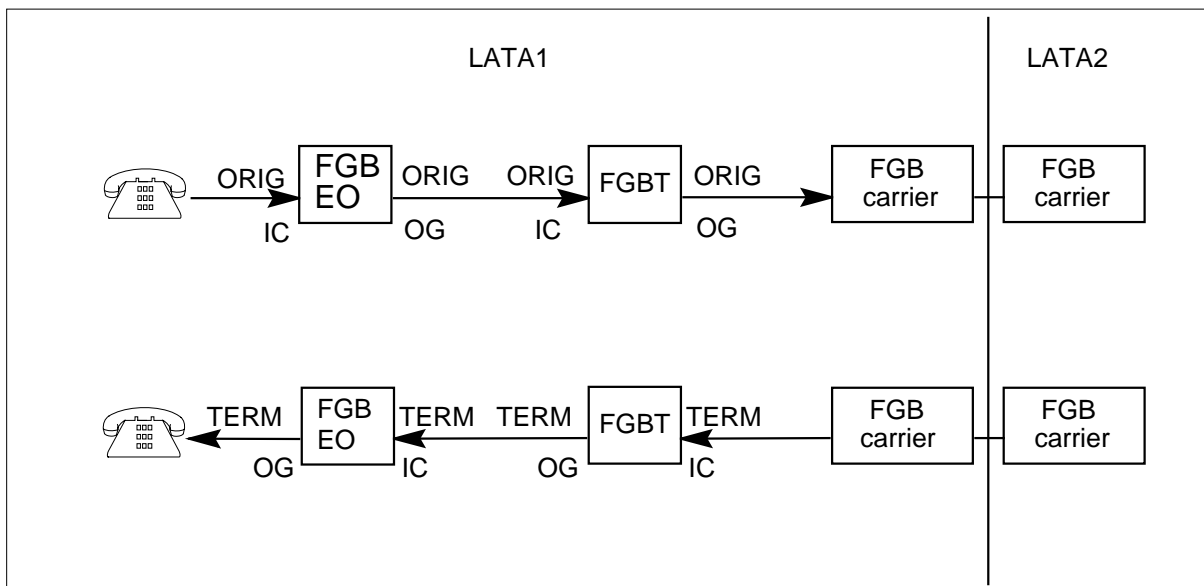
### Selecting trunk group types

This section explains the logic the system uses to select trunk group types for an FGBEO and for an FGBT. These diagrams must not be the only basis for decisions about trunk group types. Consult the data schema section of this document and the application considered.

The meaning of the names *originating*, *terminating*, *incoming*, and *outgoing* appear in the following figure. Originating (ORIG) traffic is traffic that departs a local access and transport area (LATA). Terminating (TERM) traffic is traffic that enters a LATA. The abbreviation for incoming is IC. The abbreviation for outgoing is OG.

**Feature Group B - AMA End Office** (continued)

**Traffic entering LATA1 and LATA2**



The four trunk group types are ORIG IC, ORIG OG, TERM IC, and TERM OG. The trunk group types must be identified for the FGBEO and for the FGBT.

An example of how the system routes a FGBEO trunk group for calls to an FGB carrier appears in the following figure.

**FGBEO trunk group selection for calls to an FGB carrier**

DIRECT CONNECTION FGBEO ↔ CARRIER				INDIRECT CONNECTION FGBEO ↔ FGBT ↔ CARRIER			
ORIGINATING TRAFFIC		TERMINATING TRAFFIC		ORIGINATING TRAFFIC		TERMINATING TRAFFIC	
IC from PHONE	OG to CARRIER	IC from CARRIER	OG to PHONE	IC from PHONE	OG to FGBT	IC from FGBT	OG to PHONE
LINE	OC Note 1	OC Note 1	LINE	LINE	IT Note 2	IT Note 2	LINE

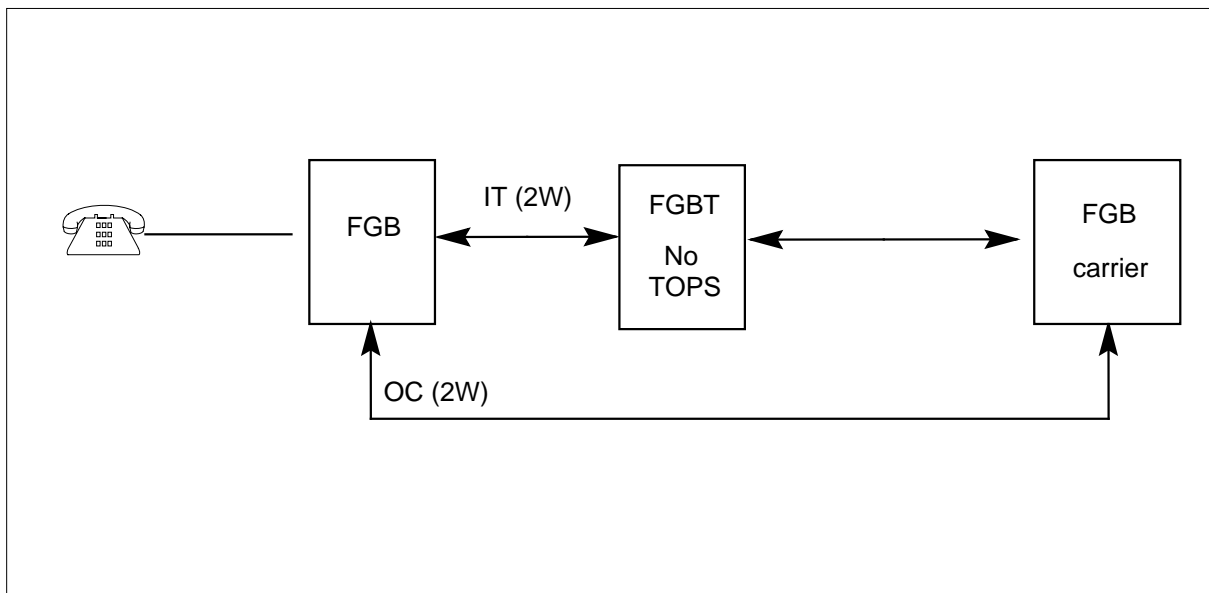
**Note 1:** For the two-way OC trunk group, set FGBTR AFC to Y in table TRKGRP. Set FGBTR AFC to Y to get a terminating billing record, call code 135.

**Feature Group B - AMA End Office** (continued)

*Note 2:* Intertoll (IT) trunk groups cannot carry automatic number identification (ANI). Use a two-way OC trunk group with FGBTRAF C set to Y if the carrier requires ANI. Centralized automatic message accounting (CAMA) billing results. In most conditions, FGB carriers do not require ANI spill.

The trunk group selection that the previous chart specifies causes the following recommended trunking arrangement at the FGBEO.

**Trunk selection—FGBEO to/from an FGB carrier**



An example of how the system routes an FGBT trunk group selection for calls to an FGB carrier appears in the following figure.

**FGBEO trunk group selection for calls to an FGB carrier**

LAMA ↔ FGBEO ↔ CARRIER				NON-LAMA FGBEO ↔ FGBEO ↔ CARRIER			
ORIGINATING TRAFFIC		TERMINATING TRAFFIC		ORIGINATING TRAFFIC		TERMINATING TRAFFIC	
IC from LAMA EO	OG to CARRIER	IC from CARRIER	OG to LAMA EO	IC from NON-LAMA EO	OG to CARRIER	IC from CARRIER	OG from NON-LAMA EO
IT Note 1	OC	OC Note 2	IT	SC	OG	OG Note 2	IT



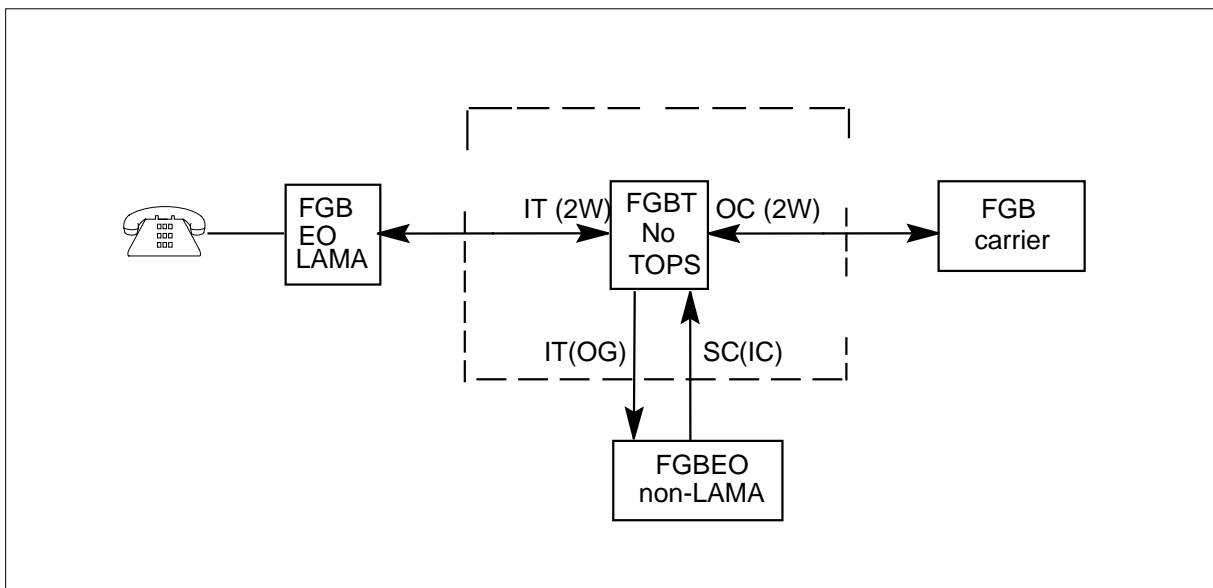
**Feature Group B - AMA End Office** (continued)

**Note 1:** Use an IT trunk group from an EO with local automatic message accounting (LAMA) if the carrier does not require ANI spill. Use a SuperCAMA (SC) trunk group if the carrier requires ANI spill. When you use a SC trunk group, billing occurs.

**Note 2:** To get a terminating billing record (call code 135), the two-way operator centralization (OC) trunk group must have FGBTR AFC set to Y. Set FGBTR AFC to Y in table TRKGRP.

The trunk group selection that the previous chart specifies causes the following recommended trunking arrangement at the FGBT.

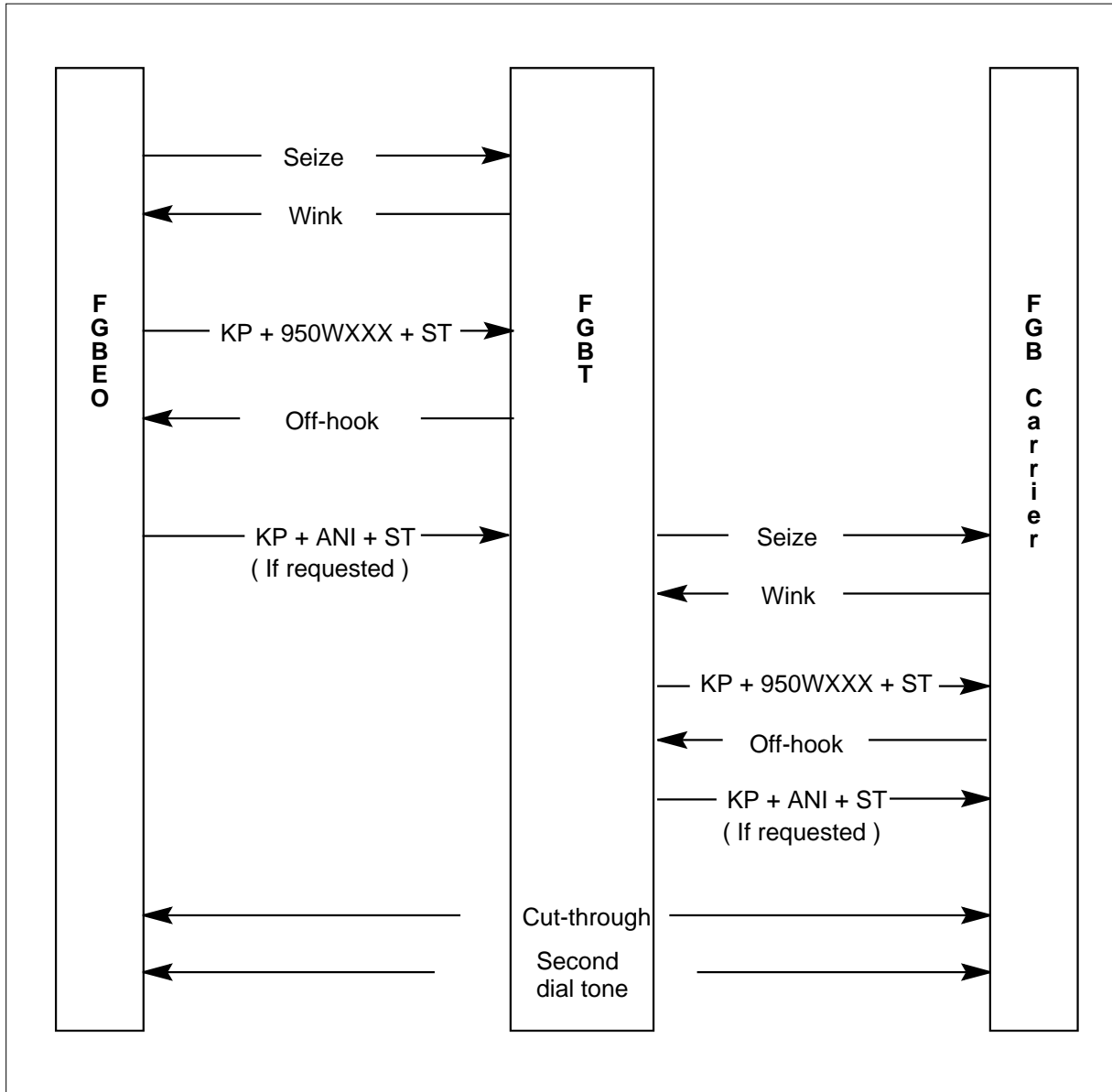
**Trunk selection—FGBT to/from an FGB carrier**



An originating FGB call in an FGB access arrangement (tandem connection) appears in the following figure.

## Feature Group B - AMA End Office (continued)

### Originating FGB call using an FGB access arrangement

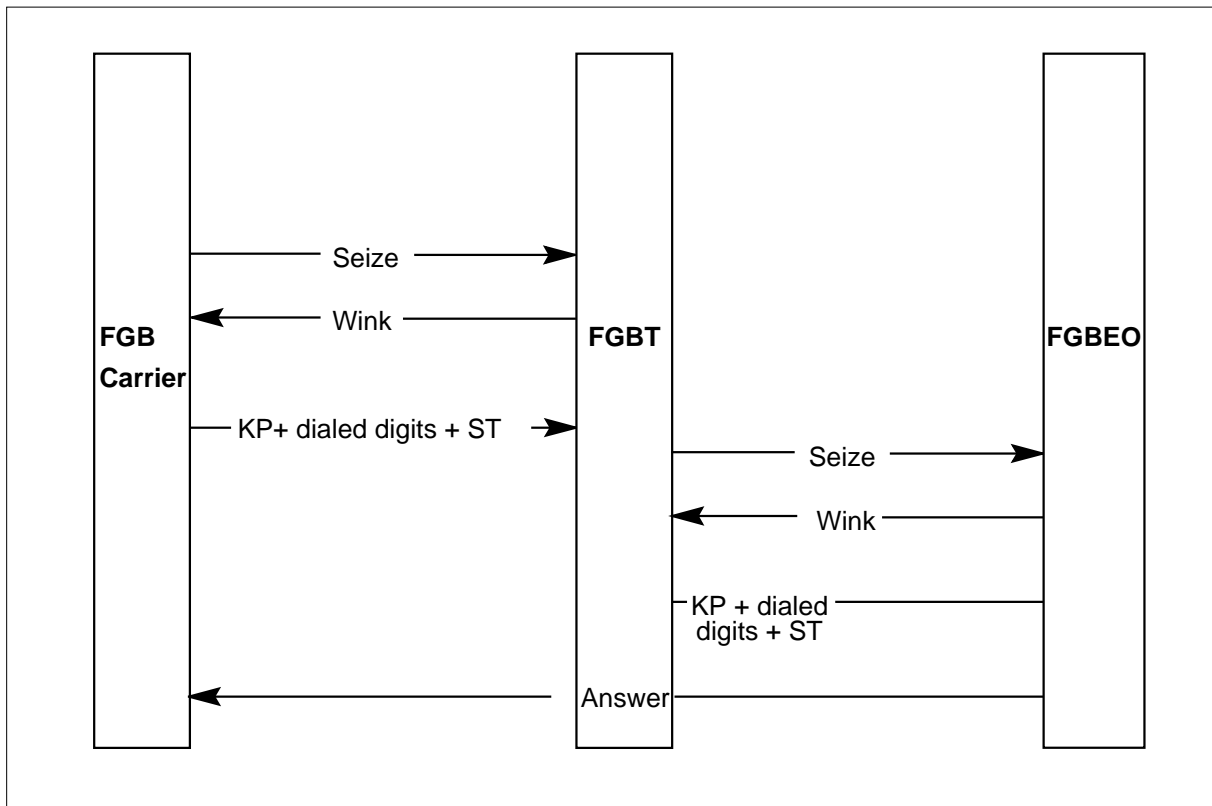


A terminating FGB call in an FGB access arrangement (tandem connection) appears in the following figure.

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**Feature Group B - AMA End Office** (continued)
 

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**Terminating FGB call using an FGB access arrangement**

Standard translations determine call routing in an FGB access arrangement. The system uses one-stage outpulsing for all FGB calls routed directly to an FGB carrier. The system uses one-stage outpulsing for all FGB calls routed through the FGBT to the FGB carrier.

The FGBEO or the FGBT and the FGB carrier perform call translation. The local office or the toll office translate the interim prefix. The local or toll office translates the prefix when the local office does not have direct trunks to a FGB carrier. The carrier translates the AUTH code and the called number.

**AMA Enhancements (BC1680)**

Feature BC1680 makes modifications to two trunk tables to ensure billing accuracy for FGB carriers. The BC1680 makes the following modifications:

- modifies the table control for table TRKNAME (trunk name)
- adds the CARRNM field to table TRKGRP (group type OC)
- names the OCCTRAFC and OCCANI fields again in table TRKGRP (group type OC)

## **Feature Group B - AMA End Office** (continued)

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### **AMA Enhancements II (BC2136)**

Feature BR0494 creates option ENFIABC. Option ENFIABC allows the system to record calls on all FGB trunk groups. Set option ENFIABC in table AMAOPTS (Automatic Message Accounting Options).

### **Access Charge Recording EO (BR0494)**

Feature BR0494 creates option ENFIABC. Option ENFIABC allows the system to record calls on all FGB trunk groups. Set option ENFIABC in table AMAOPTS.

Feature BR0494 adds fields OCCTRAFC and OCCANI to table TRKGRP (trunk group) for the outgoing CAMA (trunk group type OC). This modification allows two-way OC trunks to access FGB carriers. The OC trunks can generate the AMA records. The FGB calls require AMA records. These trunks provide ANI information in the Bellcore CAMA signaling format the carrier requires.

### **Carrier Access Code Expansion (NC0202)**

Feature NC0202 separates FGB carrier identification code (CIC) from Feature Group D (FGD) CIC. This feature expands the FGB CIC from three digits to four digits.

## **Operation**

### **AMA Enhancements (BC1680)**

Feature BC1680 modifies tables TRKGRP and TRKNAME.

Table TRKGRP, for the OC trunk group type, defines the characteristics of the outgoing traffic from local to CAMA trunk groups. Table TRKGRP defines the characteristics of two-way traffic from local to CAMA trunk groups. Table TRKNAME specifies the name of each trunk group in the DMS switch. Table TRKNAME maps each trunk group name to a trunk group number in the centralized automatic reporting on trunks (CAROT) data base.

### **TRKGRP (group type OC) modification by feature BC1680**

Feature BC1680 renames fields OCCTRAFC and OCCANI in table TRKGRP (group type OC) to FGBTRAFC and FGBANI. The feature renames the fields to clarify the type of traffic that the system can route over two-way OC trunk groups.

An OCC is a carrier that handles Feature Group B, C, and D traffic. Two-way OC trunk groups can handle only FGB traffic.

Feature BC1680 modifies table TRKGRP (group type OC). The feature adds field CARRNM to modify table TRKGRP. The carrier name field identifies

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**Feature Group B - AMA End Office** (continued)

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the carrier that uses a two-way OC trunk group. The carrier name field sets the IC/INC prefix field of the FGB terminating record, call code 135.

When field FGBTR AFC is set to N (no), fields FGBANI and CARRNM do not appear. When field FGBTR AFC is set to Y (yes), fields FGBANI and CARRNM appear. Data must be entered in fields FGBANI and CARRNM.

**TRKNAME modification by feature BC1680**

Each trunk in the switch must be identified separately. Feature BC1680 modifies the table control for table TRKNAME. The feature modifies the table so duplicate common language location identifier (CLLI) entries cannot be entered. This modification makes sure that the correct carrier is billed. The carrier is billed when the system software compares the contents of the IC/INC prefix field with the CLLI names. The IC/INC prefix field is in the FGB terminating record, call code 135. The CLLI names are in table TRKNAME.

The addition of the CARRNM field to table TRKGRP (group type OC) allows billing accuracy. When the DMS switch generates billing records, the DMS switch verifies that the carrier name in TRKGRP (group type OC) is correct. The DMS switch compares field CARRNM with field CARRNAME to verify the carrier name. Field CARRNM is in table TRKGRP (group type OC). Field TRKGRP is in table OCCNAME (Other Common Carrier Name). Table OCCNAME lists the names of all carriers that serve the DMS switch.

**AMA Enhancements II (BC2136)**

Before this feature, the system billed originating FGB calls that routed through an FGBT at the FGBT. The system billed the calls at the FGBT that used CAMA. The system billed originating FGB calls that used LAMA at the FGBEO. The calls that used LAMA had direct connections to the FGB carrier.

With this feature, the operating company can use LAMA billing for all originating FGB calls.

For LAMA billing on all originating FGB calls, the system takes the following steps:

- The system routes all originating FGB calls that do not have a direct connection to the FGB carrier to an intertoll (IT) trunk.
- The FGB selector is added to the standard pretranslator (STDPRTCT.STDPRT) subtable. The system uses the selector for all FGB calls.

**Note:** The FGB selector must be used in the FGBEO for LAMA billing to work correctly.

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**Feature Group B - AMA End Office** (continued)
 

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With this configuration, the FGBT does not require ANI digits.

The system automatically generates billing records for FGB calls that receive an off-hook from the outgoing FGB carrier trunk. If the OC requires billing records for unanswered FGB calls, the datafill must be present in tables AMAOPTS and BCCODES. This datafill appears in the following figures.

This feature requires Access Charge Recording—End Office (Bellcore Format) (BR0494).

**Datafill for table AMAOPTS**

OPTION	SCHEDULE
UNANS_TOLL	ON

The datafill in the preceding AMAOPTS example indicates that the UNANS\_TOLL option is active. With this option active, the system generates billing records for unanswered FGB calls.

**Datafill for table BCCODES**

CALLTYPE	CODES
TOLL	( 134 ) ( 135 )

The datafill in the preceding figure indicates the call code for the billing records that the UNANS\_TOLL option generates. In this example, the UNANS\_TOLL option generates billing records with call code 134 for originating unanswered FGB calls. In this example, the UNANS\_TOLL option generates and billing records with call code 135 for terminating unanswered FGB calls.

**Other BC2136 modifications**

The BC2136 feature makes the following modifications:

- This feature sets the timing for carrier off-hook at 5 s. Before BCS21, timing for carrier off-hook was not the same. The system only set the timer if the FGB carrier expected ANI. With BCS21, the DMS switch does not always receive the off-hook signal in 5 s after the switch outputs the called digits. When this event occurs, the switch makes a second attempt.

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## Feature Group B - AMA End Office (continued)

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If the switch does not receive the carrier off-hook in 5 s on the second attempt, the system takes the call down.

This feature sets the carrier off-hook timing in the FGBEO when a direct connection is present. A direct connection is a FGBEO to FGB carrier connection. The BCS21 sets timing in the FGBT if a tandem connection is present. A tandem connection is a FGBEO to FGBT to FGB carrier connection.

- This feature defines the carrier connect date and time. This feature defines the carrier connect date and time when an off-hook signal is received from the FGB carrier. Before BCS21, the carrier connect date and time were defined as the time the outgoing trunk was seized. After BCS21, the carrier connect date and time is the same as the answer date and time.

In the terminating direction, the carrier connect date and time represents the time the carrier receives the off-hook signal from the called subscriber. On terminating billing records, the carrier connect date and time are the same as the answer date and time.

### Access Charge Recording EO (BR0494)

Feature BR0494 modifies tables TRKGRP and AMAOPTS. Feature BR0494 added fields OCCTRAFC and OCCANI to table TRKGRP (group type OC). Feature BC1680 renamed these fields to FGBTRAFC and FGBANI.

Table TRKGRP defines the characteristics of the outgoing and two-way traffic from local to CAMA trunk groups. Table TRKGRP performs this action for the outgoing CAMA (group type OC) trunk group type. Table AMAOPTS controls the activation and scheduling of the recording options.

One tuple is in AMAOPTS for each recording option. To start, the system uses default values for all the options. The default values for the options are different. The office type defined in office parameter AMA\_FORMAT determines the default value. The system supports Bellcore AMA formats for FGB calls.

*Note:* For BCS19 and later versions, option ENFIABC is always set to ON.

### TRKGRP (group type OC) modification by feature BR0494

Table TRKGRP (group type OC) has two additional fields, OCCTRAFC and OCCANI. When field OCCTRAFC is Y, a two-way OC trunk group connects to an OCC switch. The two-way OC trunk group carries FGB calls. When you set field OCCTRAFC to Y, you must also enter data in field OCCANI. Field OCCANI defines the format of the ANI spills for FGB calls sent to the carrier.

## Feature Group B - AMA End Office (continued)

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When you enter a Y in field OCCANI, the system sends normal ANI spill to the carrier. When you enter N, the system sends KP + ST as the ANI spill to the carrier.

*Note:* Feature BC1680 renames fields OCCTRAFC and OCCANI to FGBTRAFC and FGBANI.

### **AMAOPTS modification by feature BR0494**

Table AMAOPTS includes option ENFIABC. Option ENFIABC allows the system to record FGB calls. The system records the calls to calculate the billing charges. Field ENFIABC is always set to ON.

### **Carrier Access Code Expansion (NC0202)**

This feature expands the carrier access code (XXX) for FGB carriers to four digits. This feature allows a standard 950-XXXX carrier identification code (CIC) to reach FGB carriers. The use of a four-digit CIC is optional. Carriers can continue to use three-digit CICs.

Table FGBCIC implements the expansion of FGB access codes. Table FGBCIC contains carrier names. Table FGBCIC contains the four-digit FGB CIC (fields CARRNAME and FGBNUM) of the carrier names. To enter the name of the carrier and the corresponding four-digit CIC in this table allows 950-XXXX dialing to that carrier. To enter the name of the carrier and the corresponding four-digit CIC in this table produces a four-digit identification code. The four-digit identification code appears in the billing record.

The originating FGB AMA record, call code 134, is modified. The terminating FGB AMA record, call code 135, is modified. For each call code, the IC/INC prefix changes. The IC/INC prefix allows four-digit CICs for carriers with four-digit FGB access codes entered in table FGBCIC.

This feature is compatible with the current three-digit identification code design for FGB. Only FGB carriers with four-digit CICs are entered in table FGBCIC. The method to produce the IC/INC prefix does not change when the carrier is not entered with an identification code. The identification code appears in table FGBCIC.



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## Feature Group B - AMA End Office (continued)

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The system generates the IC/INC prefix as follows:

- For all originating FGB calls, when the carrier name is not entered in table FGBCIC, the system generates the prefix as normal. When the carrier is entered in table FGBCIC, the system uses the FGBCIC four-digit code.

*Note:* The carrier name entered in both table TRKGRP and table FGBCIC must always be the same.

- For all terminating FGB calls, when the name of the carrier is not in table FGBCIC, the system generates the prefix as normal. The system retrieves the name of the carrier from the incoming trunk group data. When the carrier is entered in table FGBCIC, the system uses the FGBCIC four-digit code.

For example, an IC/INC can perform both FGB and FGD signaling. The IC/INC uses a four-digit access code for FGB. Table OCCINFO contains a three-digit FGD CIC. Table FGBCIC is entered with the four-digit FGB CIC of the carrier.

### Table FGBCIC created by feature NC0202

Feature NC0202 creates table FGBCIC. Table FGBCIC contains two fields, CARRNAME (IC/INC carrier name) and FGBNUM (feature group B number). When a carrier name appears in table FGBCIC, the system generates a four digit prefix.

### Translations table flow

The following list describes the Feature Group B - AMA End Office translations tables:

- Table LINEATTR contains a list of attributes associated with the line index assigned to every subscriber line.
- Table STDPRTCT contains the names of the standard pretranslator subtable (STDPRTCT.STDPRT). The operating company defines the names of the standard pretranslator subtable.
- Subtable STDPRT sets up the translations for a call type.
- Table HNPACONT contains the home or serving numbering plan areas (NPA). Table HPACONT contains the serving translation schemes (STS).
- Subtable HNPACODE specifies the route, table, or treatment to which translation must route. The translation routes for each exchange in each NPA or STS. Table HNPACONT defines each NPA or STS.
- Subtable RTEREF defines the routing for each NPA. Table HNPACONT defines each NPA.

## Feature Group B - AMA End Office (continued)

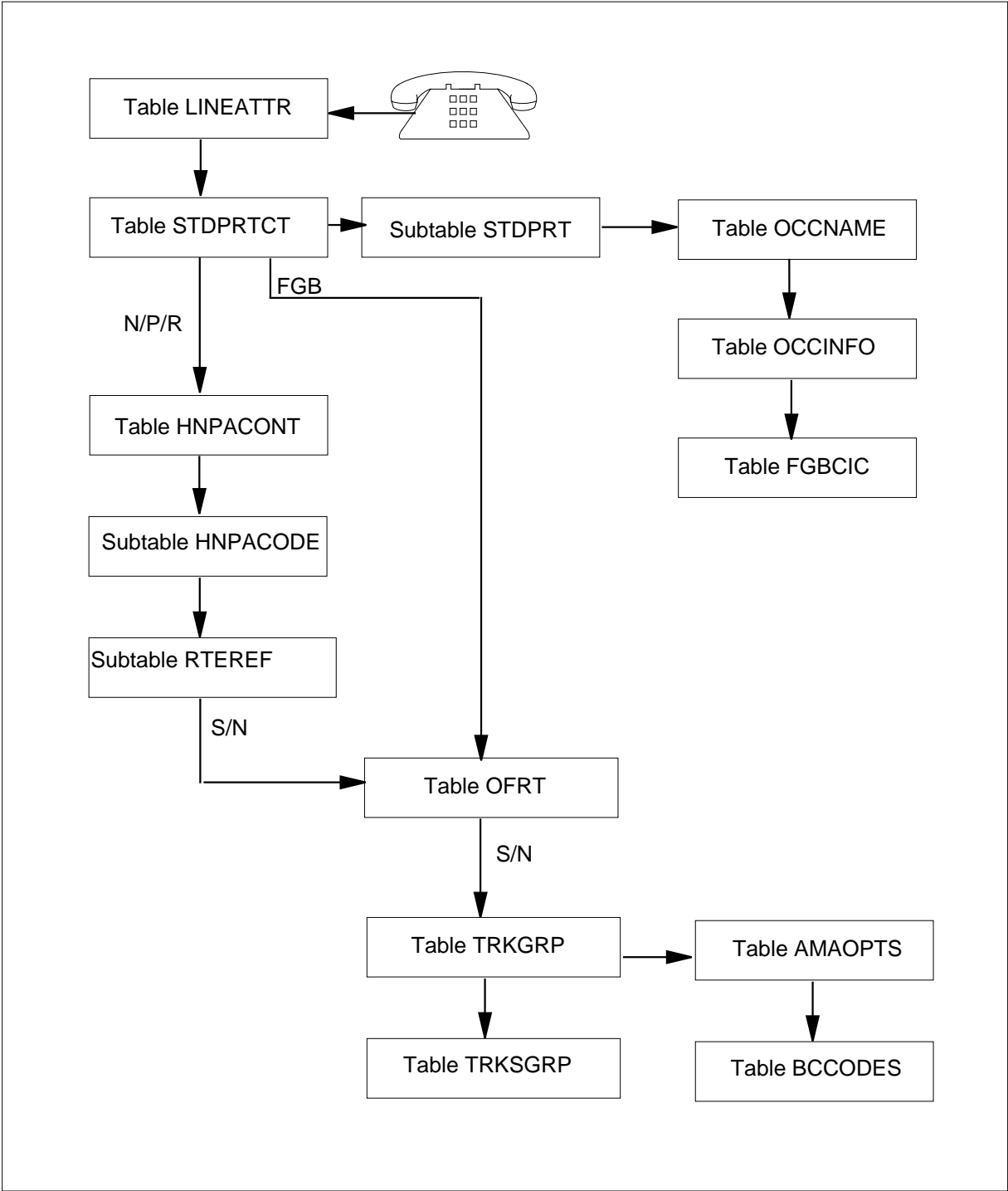
---

- Table OFRT defines all carrier routes. Table OFRT defines all operator service routes. Each tuple provides the route number (RTE). Each tuple provides the route list (RTELIST). The route list must include a primary route. The route list can include alternate routes.
- Table TRKGRP contains some of the data associated with the trunk group that handles local ANI to toll CAMA. The customer defines the data.
- Table TRKSGRP contains some of the data associated with the trunk group that handles local ANI to toll CAMA. The customer defines the data.
- Table AMAOPTS activates the recording options for local, toll, and high-revenue calls. Table AMAOPTS schedules the recording options for local, toll, and high-revenue calls. One tuple for each option is present. A schedule associated with each option is present. The schedule defines if an option is always active. The schedule defines if an option is active only at specified times. The schedule defines if an option is not active.
- Table BCCODES allows the operating company to specify which unanswered calls create billing records. If an option is active in AMAOPTS, the system searches table BCCODES for the corresponding call code. If the system finds a code in BCCODES, the system creates a billing record for that unanswered call.
- Table OCCNAME contains the names of the connected carriers. You must enter table OCCNAME before you enter tables that require a carrier name entry. Tables that require a carrier name entry are OCCINFO, TRKGRP, and STDPRT.
- Table OCCINFO defines the attributes for carriers that serve the DMS switch. Table OCCINFO screens calls for carrier compatibility.
- Table FGBCIC determines if a carrier has a three-digit or four-digit carrier access code. The system searches the table when a carrier is accessed. If the carrier name appears in the table, the system uses the four-digit access code entered.

The Feature Group B - AMA End Office translations process appears in the following flowchart.

**Feature Group B - AMA End Office** (continued)

Table flow for Feature Group B - AMA End Office



**Feature Group B - AMA End Office** (continued)

The datafill content used in the flowchart appears in the following table. The calling number is (613) 621-7665. The called number is 950-1777.

**Datafill example for Feature Group B - AMA End Office**

Datafill table	Example data
LINEATTR	0 1FR NONE NT FR01 0 613 P621 L613 TSPTS 10 NIL NILSFC LATA1 0 NIL NIL 00 Y RESGRP 0 2 \$
STDPRTCT	P621 ( 1) ( 0)
STDPRTCT. STDPRT	9501777 9501777 FGB DD 0 CAR1 Y OFRT 897 7 7
HNPACONT	613 128 1 ( 1) ( 1) ( 0) ( 0)
HNPACONT. HNPACODE	950 950 LRTE 43
HNPACONT. RTEREF	43 (N D ODCMBX2 1 8 N) \$
OFRT	897 (N D FGBCAR12W 0 0 N)
TRKGRP	FGBCAR12W OC 0 ELO NCRT LINE MIDL REV Y 2W NPRT NSCR 918 NLCL CV N N Y Y MCC (BCNAME SPEECH) \$
TRKSGRP	FGBCAR12W 0 2X81AB STD OG DP WK 7 1 MW MW N N N 1 UNEQ
AMA_OPTS	UNANS_TOLL ON
BCCODES	TOLL (034) (068) (069) (008) (110) (114) (119) (134) (135) \$ LOCAL (036) (009) (067) (074) (041) (134) (135) \$ HIGHREV (006) (068) (008) \$
OCCNAME	CAR1
OCCINFO	CAR1 777 EAP Y Y Y N Y Y Y Y Y LONG 0 FGRPC N N N Y N N Y N N N
FGBCIC	CAR1 7772

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**Feature Group B - AMA End Office** (continued)

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**Limits**

Feature Group B - AMA End Office has the following limits:

- the AMA Enhancements (BC1680)
  - Only two-way OC trunk groups support feature BC1690.
- the AMA Enhancements II (BC2136)
  - The LAMA option applies to originating FGB calls only. Terminating FGB calls that use an FGBT must be billed at the FGBT.
- Access Charge Recording EO (BR0494)
  - Feature BR0494 does not support limits.
- Carrier Access Code Expansion (NC0202)
  - Feature NC0202 affects Bellcore format AMA. Feature NC0202 does not affect NT format AMA.
  - The TOPS does not support four-digit CICs. The TOPS FGB carrier and translation datafill does not change. Calls use the three digit CICs.
  - The FGB CICs are expanded to four digits. The size of the carrier tables does not change. The maximum size of tables OCCNAME, OCCINFO, and FGBCIC, continues to be 1000 tuples.

**Interactions**

Feature Group B - AMA End Office does not have functionality interactions.

**Activation/deactivation by the end user**

Feature Group B - AMA End Office does not require activation or deactivation by the end user.

**Billing**

Feature Group B - AMA End Office does not affect billing.

**Datafilling office parameters**

Feature Group B - AMA End Office does not affect office parameters.

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**Feature Group B - AMA End Office** (continued)
 

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**Datafill sequence**

The tables that require datafill to implement Feature Group B - AMA End Office appear in the following table. The tables appear in the correct entry order.

**Datafill requirements for Feature Group B - AMA End Office (Sheet 1 of 2)**

<b>Table</b>	<b>Purpose of table</b>
OCCNAME	Equal carrier access list of other common carrier names. This table contains the names of the connected carriers. Enter table OCCNAME before any other tables that require a carrier name entry. Tables that require a carrier name entry are OCCINFO, TRKGRP, and STDPRT.
TRKGRP (group type OC)	The OG12W from local to CAMA trunk group (type OC trunk group). This table contains some of the data associated with the trunk group that handles local ANI to toll CAMA. The customer defines the data.
TRKSGRP	Trunk Subgroup. This table contains additional information for each subgroup assigned to one of the trunk groups that table TRKGRP contains.
OFRT	Office route. This table defines all carrier routes and operator service routes. Each tuple provides the route number (RTE) and the route list (RTELIST). The route list must include a primary route. The route list can include alternate routes.
OCCINFO	Other common carrier information. This table defines the attributes for carriers that serve the DMS switch. This table screens calls for carrier compatibility.
LINEATTR	Line attributes. This table provides a list of attributes associated with the line index assigned to every subscriber line.
STDPRTCT	Standard pretranslation tables. This table contains the names of subtable standard pretranslator (STDPRTCT.STDPRT). The operating company defines the subtable pretranslator names.
STDPRTCT. STDPRT	Standard pretranslator subtables. This table sets up the translations for a call type.
HNPACONT	The HNPA code subtables. This table contains the home or SNPA and the STSs.

**Feature Group B - AMA End Office** (continued)

**Datafill requirements for Feature Group B - AMA End Office (Sheet 2 of 2)**

Table	Purpose of table
HNPACONT. HNPACODE	The HNPCA CODE subtables. This table specifies the route, table, or treatment to which translation must route for each exchange in each NPA or STS that HNPACONT defines.
HNPACONT. RTEREF	The HNPCA route reference. This table defines the routing for each NPA that HNPACONT defines.
AMAOPTS	The AMA options. This table activates and schedules the recording options for local, toll, and high-revenue calls.
BCCODES	Bellcore codes. This table allows the operating company to specify which unanswered calls create billing records. If an option is active in AMAOPTS, the system searches table BCCODES for the corresponding call code. If the system finds the code in BCCODES, the system creates a billing record for that unanswered call.
FGBCIC	The FGB carrier identification code. This table determines if a carrier has a three-digit or four-digit carrier access code. The system searches this table when a carrier is accessed. If the carrier name appears in this table, the system uses the four-digit access code entered.

**Datafilling table OCCNAME**

Datafill for Feature Group B - AMA End Office for table OCCNAME appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table OCCNAME**

Field	Subfield or refinement	Entry	Explanation and action
OCCNAME		1 to 16 characters alphanumeric or USE_PREVIOUS	Other common carrier names. Enter one of the following: <ul style="list-style-type: none"> <li>the carrier name</li> <li>an alphanumeric abbreviation of the carrier name</li> <li>the reserved carrier name USE_PREVIOUS if the generic recursive pretranslator is to be used</li> </ul>

**Feature Group B - AMA End Office** (continued)

**Datafill example for table OCCNAME**

Sample datafill for table OCCNAME appears in the following example.

**MAP example for table OCCNAME**

OCCNAME
CAR1

**Datafilling table TRKGRP (group type OC)**

Datafill for Feature Group B - AMA End Office for table TRKGRP (group type OC) appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table TRKGRP (group type OC)**

Field	Subfield or refinement	Entry	Explanation and action
	FGBTR AFC	Y or N	Feature Group B traffic. Enter Y to indicate that a trunk group connects to an OCC switch. The Y indicates that the trunk group carries FGB calls. If you enter Y, enter fields FGBANI and CARRNM. If the trunk group does not connect to an OCC switch, enter N.
	FGBANI	Y or N	Feature Group B ANI. If field FGBTR AFC is Y, enter Y to indicate that a normal ANI must be provided. Enter N to indicate that KP+ST is required.
	CARRNM	Y, N, or NILC	Carrier name. If FGBTR AFC is Y, enter the name of the IC/INC carrier. Use an OC trunk group entered before in table OCCINFO. The NILC is the default entry.

**Datafill example for table TRKGRP (group type OC)**

Sample datafill for table TRKGRP (group type OC) appears in the following example.



**Feature Group B - AMA End Office** (continued)

**MAP example for table TRKGRP (group type OC)**

```

GRPKEY                                GRPINFO
-----
FGBCAR12W OC 0 ELO NCRT LINE MIDL REV Y 2W NPRT NSCR 918
NLCL CV N N Y Y Y MCC (BCNAME SPEECH) $
    
```

**Datafilling table TRKSGRP**

Datafill for Feature Group B - AMA End Office for table TRKSGRP appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table TRKSGRP (Sheet 1 of 7)**

Field	Subfield or refinement	Entry	Explanation and action
SGRPKEY		see subfields	Subgroup key. This field contains subfields CLLI and SGRP.
	CLLI	alphanumeric	Common language location identifier. Enter the code that represents the trunk group in table CLLI.
	SGRP	0 or1	Subgroup number. Enter the number (0 or 1) assigned to the trunk subgroup.
CARDCODE		alphanumeric	Card code. If the trunk is analog, enter the product engineering code (PEC) of the trunk card. If the trunk is digital, refer to the data schema section of this document for the correct code.

**Feature Group B - AMA End Office** (continued)

Datafilling table TRKSGRP (Sheet 2 of 7)

Field	Subfield or refinement	Entry	Explanation and action
SGRPVAR		see subfields	Variable subgroup data. This field contains the following subfields: <ul style="list-style-type: none"> <li>• SIGDATA</li> <li>• DIR</li> <li>• OPULSTYP</li> <li>• OSTARTSG</li> <li>• IDGTIME</li> <li>• NUMSTOPS</li> <li>• GLAREYD</li> <li>• CCONT</li> <li>• RNGBCK</li> <li>• ESUPR</li> <li>• SAT</li> <li>• REMSBY</li> <li>• TRKGRDTM</li> <li>• ECSTAT</li> </ul>
	SIGDATA	STD	Signaling data. Enter STD for standard signaling.
	DIR	OG	Direction. Enter OG for outgoing.
	OPULSTYP	DP, DT, DIGITONE, MF, MFC, NP, or RP	Outgoing type of pulsing. If the trunk group is outgoing or two-way, enter the type of pulsing: <ul style="list-style-type: none"> <li>• DP for dial pulse</li> <li>• DT for Digitone</li> <li>• MF for multifrequency</li> <li>• MFC for multifrequency compelled</li> <li>• NP for no pulsing</li> <li>• RP for revertive pulsing</li> </ul>

**Feature Group B - AMA End Office** (continued)

Datafilling table TRKSGRP (Sheet 3 of 7)

Field	Subfield or refinement	Entry	Explanation and action
	OSTARTSG	DD, GD, IM, LP, RA, WK, EX, NP	<p>Outgoing start dial signal. The trunk group is outgoing or two-way and the outgoing pulse type is DP, DT, or MF. Enter one of the following types of start dial signals required:</p> <ul style="list-style-type: none"> <li>• DD for delay dial on-hook idle</li> <li>• GD for ground</li> <li>• IM for immediate dial</li> <li>• LP for loop</li> <li>• RA for rate adaptor</li> <li>• WK for wink</li> <li>• XD for delay dial off-hook idle</li> </ul> <p>Enter NP if subfield OPULSTYP is NP.</p>
	IDGTIME	7 to 100	<p>Interdigital timing. When the trunk group is outgoing or two-way and the type of pulsing is DP, enter the interdigital timing interval. Enter the interdigital timing interval in 10 ms intervals (7-100). Enter 7 (70 ms), if the type of pulsing is MF. Enter 0 (zero) if the type of pulsing is NP.</p>
	NUMSTOPS	1 to 3	<p>Number of stops/goes. If the trunk group is outgoing or two-way IT with DP, enter the maximum acceptable number of stop/go signals (1-3). If the trunk is not outgoing or two-way IT with DP, enter 0.</p>
	GLAREYD	Y or N	<p>Yield to glare. If the trunk group is two-way and the trunk subgroup must yield to glare, enter Y. If the trunk group is not two-way and the trunk group must not yield to glare, enter N.</p>

**Feature Group B - AMA End Office** (continued)

Datafilling table TRKSGRP (Sheet 4 of 7)

Field	Subfield or refinement	Entry	Explanation and action
	CCONT	3W, EI, IB, LN, MW, TR or NO	<p>Coin control. If the trunk subgroup is arranged for coin control, enter one of the following types of coin control required:</p> <ul style="list-style-type: none"> <li>• 3W for third wire</li> <li>• EI for expanded inband</li> <li>• IB for inband</li> <li>• LN for line number</li> <li>• MW for multiwink</li> <li>• TR for tip and ring</li> </ul> <p>If the trunk group is not arranged for coin control, enter NO.</p>
	RNGBCK	3W, EI, IB, LN, MW, SX, TR, WK or NO	<p>Ringback. If the trunk subgroup is arranged for ringback signal, enter one of the following types of ringback signal required:</p> <ul style="list-style-type: none"> <li>• 3W for third wire</li> <li>• EI for expanded inband</li> <li>• IB for inband</li> <li>• LN for line number</li> <li>• MW for multiwink</li> <li>• SX for simplex</li> <li>• TR for tip and ring</li> <li>• WK for wink</li> </ul> <p>For other conditions, enter NO.</p>

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**Feature Group B - AMA End Office** (continued)

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Datafilling table TRKSGRP (Sheet 5 of 7)

Field	Subfield or refinement	Entry	Explanation and action
	ESUPR	H, N, F	<p>Echo suppressor. If the trunk group has echo suppressors, enter H (half). Enter H when a half echo suppressor is at the near end of the trunk group.</p> <p>Enter N when the trunk group has no echo suppressors at the near end of the trunk group.</p> <p>Enter F (full) when a full echo suppressor is at the near end of the trunk group. The switch takes no action. The system uses the switch for administrative purposes only. To enter F has the same effect as entering N. When you enter N, an echo suppressor is not present in the connection.</p>
	SAT	Y or N	Satellite. Enter Y if the trunk subgroup is arranged to use satellite to switch. If the trunk subgroup is not arranged to use satellite to switch, enter N.
	REMBSY	Y or N	Remote make busy. Enter Y if the trunk subgroup is assigned the Remote Make Busy (RMB) feature. For other conditons, enter N.

**Feature Group B - AMA End Office** (continued)

Datafilling table TRKSGRP (Sheet 6 of 7)

Field	Subfield or refinement	Entry	Explanation and action
	TRKGRDTM	1 to 255	<p>Trunk guard timing. If the trunk group is outgoing or two-way, enter the time that the trunk waits to receive on-hook. The time represents how long the trunk waits before reporting lockout on the trunk. The trunk receives on-hook from the far end. Enter the time in 10 ms intervals. The timer begins when the system sends an on-hook signal to the far end.</p> <p>If a new outgoing call is attempted on a trunk before the trunk receives on-hook, the peripheral delays outgoing trunk seizure. The peripheral delays outgoing trunk seizure until the trunk receives on-hook from the far end.</p> <p>If the trunk receives on-hook from the far end before lockout timer expires, the system attempts the new call on the trunk. If the trunk does not receive on-hook from the far end before lockout timer expires, the trunk reports lockout. The system attempts the call again on another trunk.</p> <p>If field OSTARTSG is LS or GS, the entry in field TRKGRDTM must be greater than 17 (170 ms).</p>
	ECSTAT	INTERNAL, EXTERNAL, INNOTONE, or UNEQ	<p>Echo canceler status. This field indicates the status of the echo canceler on the trunk subgroup. This field replaces field ECEQUIP. Enter INTERNAL, EXTERNAL, INNOTONE, or UNEQ.</p> <p>If the value is INTERNAL, enter refinements NSMATCH and AUTOON. If the value is INNOTONE, enter refinement NSMATCH.</p>

**Feature Group B - AMA End Office** (continued)

Datafilling table TRKSGRP (Sheet 7 of 7)

Field	Subfield or refinement	Entry	Explanation and action
	NSMATCH	Y or N	Noise match control. This field specifies if noise matching is on. If noise matching is on, background noise levels are maintained when the internal echo canceler actively cancels echos. Enter N to indicate that background noise is not maintained when the internal echo canceler actively cancels echos. The default value is N
	AUTOON	Y or N	Auto reenable control. Enter Y to indicate that the echo canceler is automatically turns on. The default value is Y. The echo canceler turns on after 2100-Hz tone control is removed on absence of energy. Enter N to indicate that the echo canceler does not automatically turn on after 2100-Hz tone control is removed. This option is like the end of call option for tone disablers in external echo cancelers.

**Datafill example for table TRKSGRP**

Sample datafill for table TRKSGRP appears in the following example.

**MAP example for table TRKSGRP**

```

SGRPKEY  CARDCODE
                                     SGRPVAR
-----
FGBCAR12W 0 2X81AB
          STD OG DP WK 7 1 MW MW N N N 1 UNEQ
    
```

**Datafilling table OFRT**

Datafill for Feature Group B - AMA End Office for table OFRT appears in the following table. The fields that apply to Feature Group B - AMA End Office

**Feature Group B - AMA End Office** (continued)

appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table OFRT (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
RTE		0 to 1023	Route reference index. If the record is the first in the route list, enter the route reference number assigned to the route list.  <b>Note:</b> Field MAXRTE of tables HNPACONT, FNPACONT, and FNPACONT.FNPASTS automatically extends to the highest route index. The route index is used in field RTE of subtables HNPACONT.RTEREF, FNPACONT.RTEREF, and FNPACONT.FNPASTS.RTEREF.
RTELIST		see subfields	Route list. This field contains subfields RTESEL, CONNTYPE, CLLI, DELDIGS, PRFXDIGS, CANCELC, DDLS, and ADLS.
	RTESEL	N or N2	Route selector. Enter N or N2.
	CONNTYPE	D	Connection type. Enter D to satisfy the table editor. The system logic does not use this field.
	CLLI	alphanumeric	Common language location identifier. Enter the code in table CLLI to which translation is to route.
	DELDIGS	0 to 15	Delete digits. Enter the number of digits to delete before outpulsing. If you use route selector N2, enter 15 which is the required number of digits to delete before outpulsing.
	PRFXDIGS	a maximum of 11 alphanumeric or N	Prefix digits. If digits or control signals, or both, are to be prefixed, enter the digits or equivalents that are to prefix. You can enter a maximum of 11 digits. If control signals are to be prefixed, enter the digit equivalent of the signal. Enter N if digits to prefix are not present.
	CANCELC	N	Cancel normal charge. Enter N.



**Feature Group B - AMA End Office** (continued)

Datafilling table OFRT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	DDLS	0 to 15	Delete digits last stage. Enter the number of digits to delete from the front of the called number to outpulse.
	ADLS	0 to 15 or N	Add digits last stage. Enter the accurate digits that are prefixed on to the front of the called number to be outpulsed.  Enter N if digits are not present to prefix on to the front of the called number to outpulse.

**Datafill example for table OFRT**

Sample datafill for table OFRT appears in the following example.

In the example, the following values have the following meanings:

- The 897 represents the route reference number.
- The N represents the route selector.
- The D represents the connection time.
- The FGBCAR12W represents the CLLI.
- The 0 (first) represents the number of digits to delete before outpulsing.
- The 0 (second) represents the number of digits to prefix.
- The N indicates that charges are not associated with the call because the FGB carrier handles billing for FGB calls.

The N selector is for FGB calls that the system routes to an IT trunk. When the N selector is used, standard digit control automatically cancels. The required digit deletion and digit prefixing must be specified.

**MAP example for table OFRT**

RTE	RTELIST
897	(N D FGBCAR12W 0 0 N)

**Datafilling table OCCINFO**

Datafill for Feature Group B - AMA End Office for table OCCINFO appears in the following table. The fields that apply to Feature Group B - AMA End

**Feature Group B - AMA End Office** (continued)

Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table OCCINFO (Sheet 1 of 4)**

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		1 to 16 alphanumeric	Carrier name. Enter the carrier name or a 1 to 16 character alphanumeric abbreviation of the carrier name. Enter the carrier name as the name appears in table OCCNAME. Leave this field empty if the generic recursive pretranslator associated with the reserved carrier name USE_PREVIOUS is to be used.
CARRNUM		000 to 999 or NIL	Carrier number. Enter the carrier access code (CAC) or NIL. The CAC is equal to the XXX digits in the EA prefixes (10XXX or 950YXXX).  <b>Note:</b> You can enter a maximum of 256 entries for each office.
ACCESS		EAP	Access arrangement. Enter EAP.
INTER		Y	Inter-LATA. Enter Y.
INTNTL		Y	International. Enter Y.
INTRA		Y	Intra-LATA. Enter Y.
ANI		N	Automatic number identification. Enter N.
FANI		Y or N	Flexible ANI. Enter Y if the carrier can receive flexible ANI (FANI) information digits in the place of ANI information digits. For other conditions, enter N.
ONISCRN		Y	Operator number identification screening. Enter Y if ONI traffic requires screening by an operator before outpulsing to the carrier. Enter Y if ONI traffic requires screening by a CAMA position before outpulsing to the carrier.
AD1		Y or N	Abbreviated dialing number one. Enter Y if the carrier can be accessed with abbreviated dialing. For other conditions, enter N.

---

**Feature Group B - AMA End Office** (continued)

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Datafilling table OCCINFO (Sheet 2 of 4)

Field	Subfield or refinement	Entry	Explanation and action
OVERLAP		Y or N	Overlap. Enter Y if the carrier requires digits from the AT or the EAEO using overlap outpulsing. If the carrier does not require digits from the AT or the EAEO, enter N.
INTERS		Y or N	Inter state. Enter Y if the carrier can handle traffic between states. If the carrier cannot handle traffic between states, enter N.
INTRAS		Y or N	Intra state. Enter Y if the carrier can handle traffic in the same state. If the carrier cannot handle traffic in the same state, enter N.
TERMREC		LONG	<p>Terminating access record. Enter LONG. The LONG contains the same fields as SHORT. The LONG includes the following:</p> <ul style="list-style-type: none"> <li>• service observed</li> <li>• service feature</li> <li>• overseas indicator</li> <li>• carrier connect date</li> <li>• carrier connect time</li> <li>• elapsed time from carrier</li> <li>• IC/INC call event status</li> </ul> <p>Refer to the <i>Bellcore Format Automatic Message Accounting Reference Guide</i>, 297-1001-830 for a description of terminating records.</p>
OCCSEPNO		0 to 127	Other common carrier separation number. Enter the OCC separation number used for the carrier in the Traffic Separations Measurement System (TSMS).
OPSIG		FGRPC or NONE	Operator signaling. Enter FGRPC for Feature Group D carriers that require Feature Group C operator signaling. For Feature Group C carriers, enter NONE or FGRPC. The values do not affect operator signaling to the FGC carrier. The system ignores this field is for FGC carriers.

**Feature Group B - AMA End Office** (continued)

## Datafilling table OCCINFO (Sheet 3 of 4)

Field	Subfield or refinement	Entry	Explanation and action
PICIND		N	Presubscription indicator. Enter N if the carrier does not receive the presubscription indicator. Enter this field for every entry in table OCCINFO.
NOA950		N	Nature of address indicator. Enter N to indicate that the nature of address indicator is set to the normal value. The nature address indicator is in the calling party number parameter. Enter this field for every entry in table OCCINFO.
NOA950		N	Presubscription indicator. Enter N if the carrier does not receive the presubscription indicator. The default value of N does not change the current operation of the switch.
INCCPN		N	Include calling party number. Enter N to indicate that the calling party number parameter is removed from any IAM message sent to this carrier.
DTMFIND		Y	Rotary dial/DTMF indicator. Enter Y if the carrier receives the rotary dial/DTMF indicator. The carrier receives the indicator on operator services calls that the system routes directly to the carrier. Enter this field for every entry in table OCCINFO.
OPSERV		N	Operator services. Enter N if the carrier does not accept EAOSS. The carrier requires that the operating company processes 10XXX+0 and 00 calls to the carrier. Enter this field for every entry in table OCCINFO.
CACBLOCK		Y or N	Carrier access code blocking. Enter Y if the carrier blocks all calls dialed with a carrier access code (CAC). Enter N for all other carriers. Enter this field for every entry in table OCCINFO.
CTDOA		Y	Carrier toll deny operator assisted. Enter Y to block OA calls to this carrier. The subscriber has the CTD line option applied for this specified carrier.
CMCMON		N	Cellular mobile carrier monitor. Enter N.
SCRNWATS		N	Enhanced WATS screening. Enter N.

**Feature Group B - AMA End Office** (continued)

Datafilling table OCCINFO (Sheet 4 of 4)

Field	Subfield or refinement	Entry	Explanation and action
CRMCR		Y	Circuit reservation and acknowledgment messages. Enter Y if an access tandem (AT) must send a circuit reservation message (CRM) to an interexchange carrier (IEC). The AT sends the message on FGD calls outgoing over SS7 trunk group type ATC trunks. An entry of Y means that the AT receives a circuit reservation acknowledgment (CRA) message from the IEC. The AT receives the CRA message on FGD calls incoming to the AT on MF intertoll SuperCAMA trunks. The MF is trunk group type IT. The SuperCAMA is trunk group type SC.
ATPINCL		N	Access transport parameter included. Enter N to indicate that an IAM message sent to the IEC does not contain an ATP.
INTRAOPR		N	Intra-LATA operator. Enter N.

**Datafill example for table OCCINFO**

Sample datafill for table OCCINFO appears in the following example.

**MAP example for table OCCINFO**

```

CARRNAME CARRNUM ACCESS INTER INTNTL INTRA ANI FANI
ONISCRN AD1 OVERLAP
INTERS INTRAS TERMREC OCCSEPNO OPSIG PICIND NOA950
INCCPN DTMFIND OPSERV
CACBLOCK CTDOA CMCMON SCRNWATS CRMCR ATPINCL
INTRAOPR

```

---

```

CAR1      777      EAP      Y Y Y N Y
      Y Y      Y
      Y Y      LONG      0 FGRPC      N      N
      N      Y      N
      N Y      N      N Y      N
      N

```

**Datafilling table LINEATTR**

Datafill for Feature Group B - AMA End Office for table LINEATTR appears in the following table. The fields that apply to Feature Group B - AMA End

**Feature Group B - AMA End Office** (continued)

Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table LINEATTR (Sheet 1 of 3)**

<b>Field</b>	<b>Subfield or refinement</b>	<b>Entry</b>	<b>Explanation and action</b>
LNATTIDX		0 to 31 999	Line attribute index. Enter the line attribute index.
LCC		alphanumeric	Line class code. Enter the LCC assigned to the line attribute index. You cannot change the LCC of a current tuple.
CHGCLSS		NONE	Charge class. If a switching unit is arranged for LAMA, enter the charge class assigned to the line attribute index. If a switching unit is not arranged for LAMA, enter NONE.
COST		NT	Class of service tone. Enter NT.
SCRNCL		NSCR	Class of service screening subtable name. If screening by class of service is required, enter the name of the class of service subtable that the operating company assigned to the line attribute index. If screening is not required, enter NSCR.
LTG		0 to 9 998	Line treatment group. Enter the line treatment group assigned to the line attribute index.
STS		000 to 999	Serving translation scheme. Enter the serving NPA assigned to the line attribute index. You cannot change the STS of an current tuple.
PRTNM		NPRT	Standard pretranslator subtable name. The pretranslation of digits is required. Enter the name of the standard pretranslator subtable assigned to the line attribute index. If standard pretranslation is not required, enter NPRT.
LCANAME		NLCA	Local calling area screening subtable name. The screening of local NNX codes is required. Enter the name of the local calling area subtable assigned to the line attribute index. If screening is not required, enter NLCA.

---

**Feature Group B - AMA End Office** (continued)

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Datafilling table LINEATTR (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
ZEROMPOS		NONE	<p>Zero minus position. A line attribute is arranged for operator (0-) and special toll (0+) dialing. Enter the position in table POSITION to which operator (0-) calls are routed.</p> <p>If the line attribute is not arranged for operator (0-) and special toll (0+) dialing, enter NONE.</p>
TRAFSNO		0 to 127	<p>Traffic separation number. Enter the source and destination traffic separation number assigned to the line attribute index. The number can be 1 to 127.</p> <p>If the source and destination traffic separation number is not required, enter 0.</p>
MRSA		NIL	<p>Message rate service area. Enter NIL if MUMR billing records are not required.</p> <p><b>Note:</b> A line does not need to be a message rate to be a multiunit message rate line. The LCC of the line indicates if the line is a message rate.</p>
SFC		NILSFC	<p>International subscriber feature class. Enter NILSFC to satisfy the table editor.</p>
LATANM		LATA	<p>Local access and transport area name. Enter the name of the LATA associated with this line attribute.</p>
MDI		0	<p>Metering data index (international switch only). Enter 0.</p>
IXNAME		0	<p>Metering data index (international switch only). Enter 0.</p>
	XLASYS	NIL	<p>International translations system. Enter NIL to satisfy the table editor.</p>

**Feature Group B - AMA End Office** (continued)

Datafilling table LINEATTR (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	XLANAME		International translations name. If XLASYS is NIL, there is no prompt for this field.
DGCLNAME		00 to 99 or B, C, D, E, F, or N	Flexible ANI information digit pairs. For offices with the flexible ANI information digit assignment feature. Enter the flexible ANI information digit pair (00 to 99) or letters B, C, D, E, F, or N, associated with this line attribute index.  For other conditions, enter 00.

**Datafill example for table LINEATTR**

Sample datafill for table LINEATTR appears in the following example.

**MAP example for table LINEATTR**

```

LNATTIDX LCC CHGCLSS COST SCRNL LGT STS PRTNM LCANAME
ZEROMPOS TRAFSNO
MRSA SFC LATANM MDI IXNAME DGCLNAME FANIDIGS
RESINF OPTIONS
-----
0 1FR NONE NT FR01 0 613 P621 L613
TSPS 10
NIL NILSFC LATA1 0 NIL NIL 00
Y RESGROUP 0 2 $
    
```

For BCS34 and later versions, fields LCABILL and HOT are removed in table LINEATTR. Fields LCABILL and HOT are options in the options field.

**Datafilling table STDPRTCT**

Datafill for Feature Group B - AMA End Office for table STDPRTCT appears in the following table. The fields that apply to Feature Group B - AMA End



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## Feature Group B - AMA End Office (continued)

---

Office appear in this table. See the data schema section of this document for a description of the other fields.

### Datafilling table STDPRTCT

Field	Subfield or refinement	Entry	Explanation and action
EXTPRTNM		see subfield	<p>External standard pretranslator subtable name. Enter the name that represents the standard pretranslator subtable. The operating company defines the standard pretranslator subtable name. Do not enter standard pretranslator name C7PT. The ISUP trunks automatically used C7PT on test calls in offices with ISUP capability.</p> <p><b>Note:</b> The maximum number of tuples in table STDPRTCT is 4095.</p>

### Datafill example for table STDPRTCT

Sample datafill for table STDPRTCT appears in the following example.

#### MAP example for table STDPRTCT

EXTPRTNM	STDPRT
P621	( 1 )

### Datafilling subtable STDPRT

Datafill for subtable STDPRT in table STDPRTCT appears in the following table. The fields that apply to Feature Group B AMA—End Office appear in this table. See the data schema section of this document for a description of the other fields.

The FGB—AMA Enhancements II feature adds the FGB selector to subtable STDPRT. The FGB selector identifies FGB calls (950-WXXX dialing) in the

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**Feature Group B - AMA End Office** (continued)
 

---

translation stage of the calls. The FGB selector identifies FGB calls to distinguish FGB calls that terminate on IT trunks from other call types.

**Datafilling subtable STDPRT**

Field	Subfield or refinement	Entry	Explanation and action
	PRERTSEL	FGB	Pretranslation route selector. Enter FGB to originate FGB calls (950-WXXX dialing).

**Datafill example for subtable STDPRT**

Sample datafill for subtable STDPRT in table STDPRTCT appears in the following table. The subtable is set up for FGB calls. Translations must define all FGB calls as direct dialed (DD).

A description of the sample tuple is as follows:

- The first and second fields in this tuple define the digits that are translated at the FGBEO or the FGBT.

*Note:* The last nine fields in this tuple are known as PRETRTE.

- Selector type—FGB represents the type of selector that must be used in this tuple. The FGB selector identifies all FGB calls.
- Type of call—The call type in this tuple is DD.
- Number of prefix digits—The number of prefix digits is 0.
- Carrier name—CAR1 is the carrier name. Table OCCNAME defines the carrier name.
- Route present indicator—Y indicates that a route is present.
- Table name—OFRT is the name of the table to which all calls are routed.
- Route reference number—The value 897 is the route reference number assigned to that route in table OFRT.
- Minimum number of digits received, maximum number of digits received—The minimum and maximum number of digits that the FGBEO must collect. The FGBEO must collect seven digits before the FGBEO can outpulse information to the carrier. The eighth and ninth fields of this tuple indicate the minimum and maximum number of digits.

**Feature Group B - AMA End Office** (continued)

**MAP example for subtable STDPRT**

FROMDIGS	TODIGS	PRETRTE
9501777	9501777	
	FGB DD 0 CAR1	Y OFRT 897 7 7

**Datafilling table HNPACONT**

Datafill for Feature Group B - AMA End Office for table HNPACONT appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table HNPACONT**

Field	Subfield or refinement	Entry	Explanation and action
NPA		000 to 999	<p>Serving translation scheme. Enter the three-digit SNPA or STS code.</p> <p><b>Note:</b> A home or SNPA must have 1 or 0 as the middle digit. Enter the home or SNPA in one of the first 16 positions. You can only use SNPAs in line data, POTS VFG data, PBX trunk data. You can only use SNPAs in tables DNINV, DNROUTE, and TOFCNAME.</p> <p>You can enter STS codes other than SNPA in any position. You can reserve space for the addition of SNPAs after the initial datafill. Reserve the space in the first 16 positions of table HNPACONT. To reserve space, add dummy SNPAs before you enter STSs other than SNPA.</p>
MAXRTE		2	<p>Number of route references. Enter 2 for the quantity of route reference numbers.</p> <p>This field is automatically extends to the highest route index in subtable HNPACONT.RTEREF. The limit of the route index is from 1 to 1023.</p>
NOAMBIGC		0 to 159	<p>Number of ambiguous codes. Enter the number of ambiguous codes required.</p>

## Feature Group B - AMA End Office (continued)

### Datafill example for table HNPACONT

Sample datafill for table HNPACONT appears in the following example.

### MAP example for table HNPACONT

NPA	MAXRTE	NOAMBIGC	RTEREF	HNPACODE	ATTRIB	RTEMAP
613	128	1 ( 1)	( 1)	( 0)	( 0)	

### Datafilling subtable HNPACODE

Datafill for subtable HNPACODE in table HNPACONT appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

#### Datafilling table subtable HNPACODE

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric	From digits. Enter a numeric string where the leading three digits represent an office code in the home NPA (HNPA). This number can represent a single code. This number can represent the first in a block of following codes that have the same input data.
TODIGS		numeric	To digits. If field FROMDIGS represents a single code, enter the same single code as in FROMDIGS. If field FROMDIGS represents the first number of a block of following numbers, enter the last number in the block.
CDRRTMT		see subfields	Code type, route reference, and treatment. This field contains subfields CD and RR.
	CD		Code type. Enter the appropriate HNPA code for the route.
	RR	1 to 1023	Route reference index. Enter the route reference index of the route list in subtable HNPACONT.RTEREF. Enter the route reference index at the same position SNPA as this subtable HNPACONT.HNPACODE, to which translation proceeds.

**Feature Group B - AMA End Office** (continued)

**Datafill example for subtable HNPACODE**

Sample datafill for subtable HNPACODE appears in the following example.

**MAP example for subtable HNPACODE**

FROMDIGS	TODIGS
	CDRRTMT
950	950
	LRTE 43

**Datafilling subtable RTEREF**

Datafill for subtable RTEREF in table HNPACONT appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling subtable RTEREF (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
RTE		0 to 1023	Route reference index. If the record is the first in the route list, enter the route reference number assigned to the route list.
RTELIST		see subfields	Route list. This field contains the following subfields: <ul style="list-style-type: none"> <li>• RTESEL</li> <li>• CONNTYPE</li> <li>• CLLI</li> <li>• DELDIGS</li> <li>• PRFXDIGS</li> <li>• CANCNORC</li> </ul>
	RTESEL	N	Route selector. Enter N.
	CONNTYPE	D	Connection type. Enter D to satisfy the table editor. The system logic does not use this field.
	CLLI	alphanumeric	Common language location identifier. Enter the code in table CLLI to which the system routes translation.

**Feature Group B - AMA End Office** (continued)

**Datafilling subtable RTEREF (Sheet 2 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
	DELDIGS	0 to 15	Delete digits. Enter the number of digits to delete before outpulsing.
	PRFXDIGS	0 to 11	Prefix digits. If digits control signals, or both, are to be prefixed, enter the digits or the equivalents to prefix. If control signals are to be prefixed, enter the digit equivalent of the signal
	CANCNORC	N	Cancel normal charge. Enter N.

**Datafill example for subtable RTEREF**

Sample datafill for subtable RTEREF appears in the following example.

**MAP example for subtable RTEREF**

RTE	RTELIST
43	(N D ODCMBX2 1 8 N) \$

**Datafilling table AMAOPTS**

Datafill for Feature Group B - AMA End Office for table AMAOPTS appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table AMAOPTS**

Field	Subfield or refinement	Entry	Explanation and action
OPTION		ENFIA_B_C and UNANS_TOLL	Option. Enter ENFIA_B_C and UNANS_TOLL.
SCHEDULE		see subfield	Schedule. This field contains subfield AMASEL.
	AMASEL	ON	The AMA selector. Enter ON to activate ENFIA_B_C and UNANS_TOLL.

**Datafill example for table AMAOPTS**

Sample datafill for table AMAOPTS appears in the following example.

**Feature Group B - AMA End Office** (continued)

**MAP example for table AMAOPTS**

OPTION	SCHEDULE
ENFIA_B_C	ON
UNANS_TOLL	ON

**Datafilling table BCCODES**

Datafill for Feature Group B - AMA End Office for table BCCODES appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table BCCODES**

Field	Subfield or refinement	Entry	Explanation and action
CALLTYPE		LOCAL, TOLL, HIGHREV, TOPS	<p>Bellcore call type. Enter one of the following Bellcore call types:</p> <ul style="list-style-type: none"> <li>• LOCAL for local calls</li> <li>• TOLL for toll calls</li> <li>• HIGHREV for high-revenue calls</li> </ul> <p><b>Note:</b> If the HIGHREV option is set to ON, then the system records all HIGHREV calls with a call code table BCCODE defines. The system does not record unanswered calls when the HIGHREV option is set to ON.</p> <ul style="list-style-type: none"> <li>• TOPS for TOPS calls</li> </ul>
CODES		numeric	<p>Bellcore call codes. Enter any group of the three-digit Bellcore call codes. Separate each call code by a blank column. For a complete list of Bellcore call codes, refer to table BCCODES in the data schema section of this document.</p>

**Datafill example for table BCCODES**

Sample datafill for table BCCODES appears in the following example.

## Feature Group B - AMA End Office (continued)

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### MAP example for table BCCODES

CALLTYPE	CODES
TOLL	(034) (068) (069) (008) (110) (114) (119) (134) (135) \$
LOCAL	(036) (009) (067) (074) (041) (134) (135) \$
HIGHREV	(006) (068) (008) \$

### Datafilling table FGBCIC

Datafill for Feature Group B - AMA End Office for table FGBCIC appears in the following table. The fields that apply to Feature Group B - AMA End Office appear in the table. See the data schema section of this document for a description of the other fields.

**Note:** The system allocates store for table FGBCIC when the you add the first tuple to the table. A store is not wasted if the table is not datafilled. When you add the first tuple to the table, the system allocates room for 1000 tuples.



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**Feature Group B - AMA End Office** (continued)

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You cannot turn this table on or off. If data is not entered table FGBCIC, items in translations or billing do not change.

**Datafilling table FGBCIC**

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		1 to 16	Carrier number. Enter the 1 to 16 character alphanumeric name of the IC/INC carrier. The carrier name must correspond to a carrier name in table OCCINFO or TRKGRP. The carrier name must appear in table OCCNAME to be correct. If the carrier name is not entered in table OCCNAME, the following error message appears:  *** ERROR ***  TYPE OF CARRNAME IS CARRIER_KEY
FGBNUM		numeric (4 digits, range 0 to 9)	Feature group B number. Enter the four-digit code associated with the carrier name. The code must contain four digits (from 0 to 9). A nil value is not correct. A nil value results in the following error message:  THE CARRIER CODE MUST BE FOUR VALID DIGITS  You cannot use a carrier identification code twice. This condition makes sure problems with reverse mapping of FGB CICs to carrier names do not occur. Any attempt to enter a CIC that was used earlier in a carrier causes the following error message:  DUPLICATE FGB CARRIER CODES NOT ALLOWED.

**Datafill example for table FGBCIC**

Sample datafill for table FGBCIC appears in the following example.

## Feature Group B - AMA End Office (continued)

---

### MAP example for table FGBCIC

CARRNAME	FGBNUM
CAR1	7772

### Tools for verifying translations

The output from TRAVER when TRAVER verifies Feature Group B - AMA End Office appears in the following example.

The following TRAVER example represents only one of several possible TRAVER results. The TRAVER results can vary on each switch.

---

**Feature Group B - AMA End Office (end)**


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**TRAVER output example for Feature Group B - AMA End Office**

```

>TRAVER L 6211235 9502345 B
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 STDPRTCT
P621 ( 1) ( 1)
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO DOCUMENTATION.
DOCUMENTATION.
. 9502345 9502345 FGB DD 0 CARB Y OFRT 905 7 7
. . TABLE OFRT
. . 905 N D FGBCAR2W 0 N N
. . EXIT TABLE OFRT
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N

+++TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 FGBCAR2W      9502345 ST

TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

+++TRAVER: SUCCESSFUL CALL TRACE +++

```

**SERVORD**

Feature Group B - AMA End Office does not use SERVORD.

## **FGB AMA End Office (ATT Format)**

---

### **Ordering codes**

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### **Release applicability**

BCS33 and later versions

### **Requirements**

The FGB AMA End Office (ATT Format) does not have requirements.

### **Description**

The FGB AMA End Office (ATT Format) feature package allows the system to generate billing records for calls to FGB carriers. This package makes sure the carrier identification information in the records is correct.

This feature package allows two-way OC trunk groups to access FGB carriers and generate billing records for FGB calls. This package also allows FGB calls routed through an AT to be billed in the end office.

This feature package separates FGB CICs from FGD CICs and expands the FGB CIC from three digits to four digits.

### **Operation**

The NTX209AB feature package, in combination with the correct trunking and translations, sets up an FGB access arrangement. Networks that support this arrangement allow end offices and ATs to provide subscribers with access to FGB carriers. Every office that participates in the network accept FGB dialing and FGC signaling. Every subscriber that participates in the network must have Dual Tone multifrequency telephones. These telephones allow audio tones that represent the digits dialed to pass through the network to the carrier.

This section describes the features for the FGB AMA End Office (ATT Format) feature package.

#### **The operation of billing for FGB calls**

Table AMAOPTS controls the activation and scheduling of the recording options. This table includes the ENFIA\_B\_C option. The ENFIA\_B\_C

---

## FGB AMA End Office (ATT Format) (continued)

---

option allows the system to record FGB calls for calculation of correct billing charges. The ENFIA\_B\_C is always set to ON.

*Note:* If an office uses the NT AMA format and the DMS software does not include table AMAOPTS, the following event occurs. The system automatically turns on the ENFIA\_B\_C option.

Each recording option has one tuple in table AMAOPTS. The system first uses default values for each of the options. The default values on the office type are defined as NT or Bellcore in office parameter AMA\_FORMAT. The NT and Bellcore AMA formats have support for FGB calls.

### Ensuring the accuracy of billing records

Table TRKNAME specifies the name of each trunk group in the DMS switch. This table maps each trunk group name to a number in the centralized automatic reporting on trunks (CAROT) database.

Each trunk in the switch must have a different identification. This feature package modifies the table control for table TRKNAME. This action occurs prevent duplicate CLLI entries. This modification makes sure the correct carrier is billed when the system software makes a comparison. The system software compares the IEC/INC prefix field in the FGB terminating record with the CLLI names in table TRKNAME. The FGB terminating record is call code 135.

### FGB on two-way trunk groups

Table TRKGRP for the OC trunk group type defines the characteristics of the outgoing and two-way trunk groups from local to CAMA trunk groups. This feature package adds subfields FGBTR AFC and FGBANI to this table. With this modification, two-way OC trunks can access FGB carriers and generate the AMA records required for FGB calls. These trunks also provide ANI information in the Bellcore CAMA signaling format the carrier requires.

This feature package modifies table TRKGRP with the addition of subfield CARRNM. This subfield identifies the carrier with a two-way OC trunk group. This field sets the IC/INC prefix field of the FGB terminating record, call code 135.

The addition of subfield CARRNM to table TRKGRP (OC) makes sure billing is correct. When the system generates billing records, the DMS switch can verify that the carrier name in table TRKGRP (OC) is correct. The DMS switch compares subfield CARRNM in this table with field OCCNAME in table OCCNAME. Table OCCNAME lists the names of every carrier that serves the DMS switch.

## **FGB AMA End Office (ATT Format)** (continued)

---

### **Billing FGB calls from LAMA end office to IEC via AT**

This feature allows FGB calls routed through an AT to be billed in the end office. The system produces correct call code 134 billing record and ANI digits do not spill to the AT.

### **FGB CIC expansion**

This feature package expands the CIC for FGB carriers to four digits to allow a uniform 950-XXXX FGB CAC. This expanded code is optional. Carriers can continue to use the old three-digit CIC.

To implement the expansion of FGB CICs, the creation of table FGBCIC occurs. The table contains carrier names and the four-digit FGB CICs. Data entry for this table allows 950-XXXX dialing to that carrier. Data entry for this table causes the system to produce a four-digit CIC in the billing record.

This CIC expansion is compatible with the current three-digit CIC scheme for FGB. Only FGB carriers with four-digit CICs must be entered in table FGBCIC.

The generation of the IEC/INC prefix in the billing record follows:

- For every originating FGB call, if the carrier name entry is not in table FGBCIC, the system generates the prefix normally. If the carrier entry is in table FGBCIC, use of the FGBCIC four-digit code occurs.
- For every terminating FGB call, if the carrier name is not in table FGBCIC, the system generates the prefix normally. The carrier name is retrieved from the incoming trunk group data. If the carrier entry is in table FGBCIC, use of the FGBCIC four-digit code occurs.

An IEC or INC is capable of FGB and FGD signaling and uses a four-digit access code for FGB. When this condition occurs, table OCCINFO can contain the FGD CIC. Data entry for table FGBCIC occurs with the four-digit FGB CIC.

### **Translations table flow**

The FGB AMA End Office (ATT Format) translations tables appear in the following list:

- Table LINEATTR provides a list of attributes associated with the line index assigned to every subscriber line.
- Table STDPRTCT lists the operating company-defined names of the standard pretranslator subtable (STDPRTCT.STDPRT).
- Subtable STDPRTCT.STDPRT sets up the translations for a specified call type.

---

**FGB AMA End Office (ATT Format)** (continued)

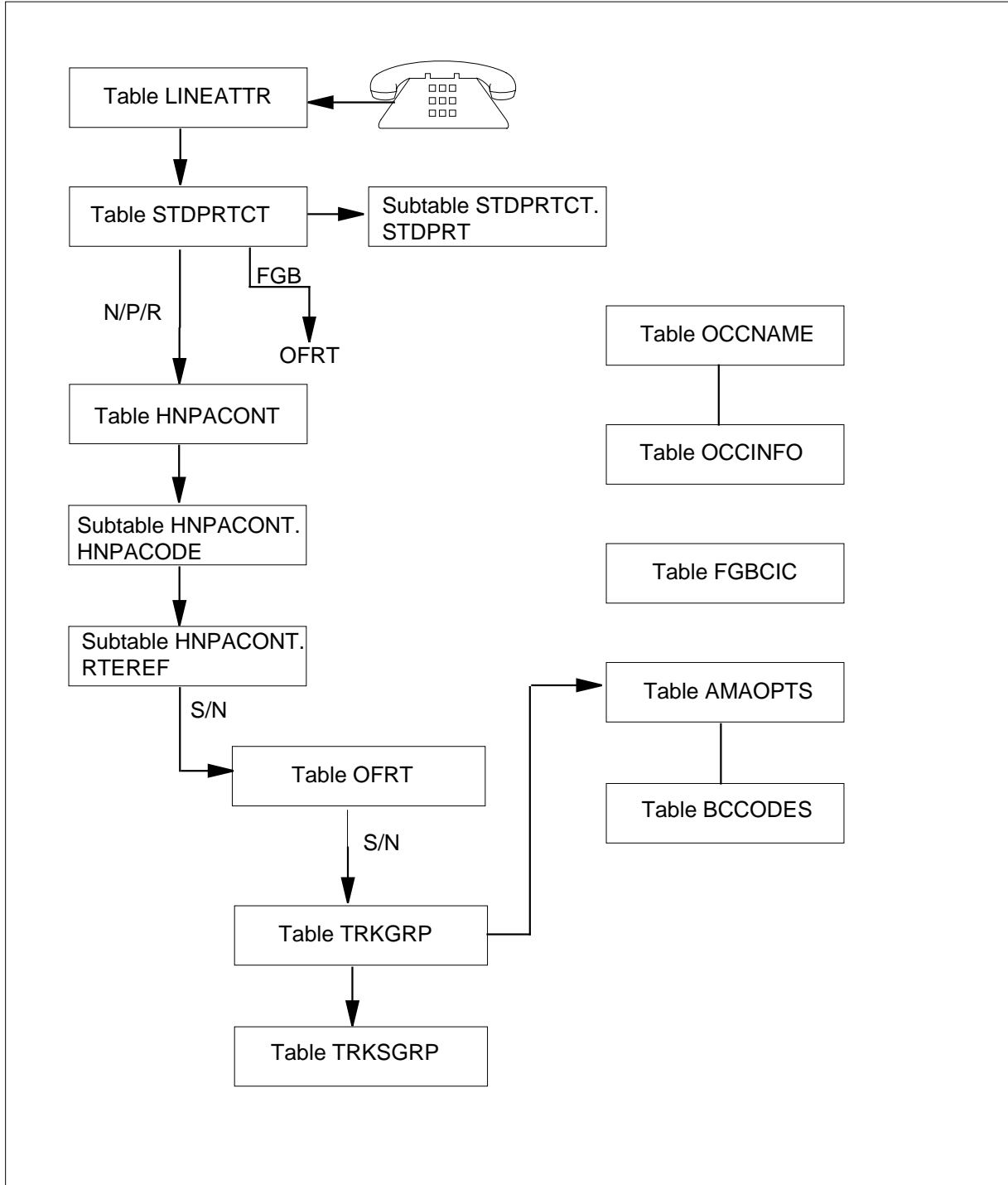
---

- Table HNPACONT lists the home or SNPA and the STS.
- Subtable HNPACONT.HNPACODE specifies the route, table or treatment to which translation must route. The subtable specifies this translation route for each exchange in NPAs or STSs defined in table HNPACONT.
- Subtable HNPACONT.RTEREF defines the routing for each NPA defined in table HNPACONT.
- Table OFRT defines each carrier route and operator service route. Each tuple provides the route number and the route list. The route list must include a primary route and can include alternate routes.
- Table TRKGRP contains some of the customer-defined data associated with the trunk group that handles local ANI to toll CAMA.
- Table TRKSGRP lists additional information for each subgroup assigned to one of the trunk groups in table TRKGRP.
- Table AMAOPTS controls the activation and scheduling of the recording options for local, toll and high-revenue calls. Each option has one tuple. Each option has an associated schedule. The schedule defines if an option is active, active only at specified times or not active.
- Table BCCODES allows the operating company to specify which unanswered calls create billing records. If an option is active in table AMAOPTS, a search of table BCCODES occurs for the corresponding call code. If the code is in table BCCODES, the system creates a billing record for that unanswered call.
- Table OCCNAME lists the names of the connected carriers.
- Table OCCINFO defines the attributes for carriers that serve the DMS switch and screens calls for carrier compatibility.
- Table FGBCIC determines if the carrier has a three-digit or four-digit CIC. A table search occurs when access to a carrier occurs. If the carrier name appears in the table, use of the four-digit CIC occurs.

The FGB AMA End Office (ATT Format) translation process appears in the following flowchart.

## FGB AMA End Office (ATT Format) (continued)

Table flow for FGB AMA End Office (ATT Format)





**FGB AMA End Office (ATT Format)** (continued)

The datafill content in the flowchart appears in the following table. The calling number is (613) 621-7665 and the called number is 950-1777.

**Datafill example for FGB AMA End Office (ATT Format)**

Datafill table	Example data
LINEATTR	0 1FR NONE NT FR01 0 613 P621 L613 N TSPS N 10 NIL NILSFC LATA1 0 NIL NIL 00 Y RESGRP 0 2
STDPRTCT	P621 ( 1) ( 0)
STDPRTCT. STDPRT	9501777 9501777 FGB DD 0 CAR1 Y OFRT 897 7 7
HNPACONT	613 128 1 ( 1) ( 1) ( 0) ( 0)
HNPACONT. HNPACODE	950 950 LRTE 43
HNPACONT. RTEREF	43 (N D ODCMBX2 1 8 N) \$
OFRT	897 (N D FGBCAR12W 0 0 N)
TRKGRP	FGBCAR12W OC 0 ELO NCRT LINE MIDL REV Y 2W NPRT NSCR 918 NLCL CV N N Y Y MCC (BCNAME SPEECH) \$
TRKSGRP	FGBCAR12W 0 2X81AB STD OG DP WK 7 1 MW MW N N N 1 UNEQ
AMAOPTS	UNANS_TOLL ON
BCCODES	TOLL (034) (068) (069) (008) (110) (114) (119) (134) (135) \$ LOCAL (036) (009) (067) (074) (041) (134) (135) \$ HIGHREV (006) (068) (008) \$
OCCNAME	CAR1
OCCINFO	CAR1 777 EAP Y Y Y N Y Y Y Y Y Y LONG 0 FGRPC N N N Y N N Y N N Y N N
FGBCIC	CAR1 7772

## **FGB AMA End Office (ATT Format)** (continued)

---

### **Limits**

The following limits apply to FGB AMA End Office (ATT Format):

- This feature package affects Bellcore format AMA, but does not affect NT format AMA.
- The TOPS feature does not support four-digit CICs at this time. The TOPS FGB carrier and translation datafill does not change, and calls continue to use the three-digit CICs.
- The FGB CICs expand to four digits, the size of any carrier table does not change. The maximum size of tables OCCNAME, OCCINFO, and FGBCIC continues to be 1000 tuples.

### **Interactions**

The FGB AMA End Office (ATT Format) does not have functionality interactions.

### **Activation/deactivation by the end user**

The FGB AMA End Office (ATT Format) does not require activation or deactivation by the end user.

### **Billing**

The carrier for originating calls and the local or toll office for terminating calls generates AMA records. The ENFIA\_B\_C option allows the system to record FGB calls and generate billing records.

The two types of AMA records that generate for FGB calls are FGB originating, call code 134, and FGB terminating, call code 135. Each record provides carrier identification and connect time information. This feature package modifies these call codes. The IC/INC prefix changes to allow four-digit CICs for carriers entered in table FGBCIC.

The format of the originating record is like the format of the terminating record except for the call code. An FGB terminating record appears in the following example.

---

**FGB AMA End Office (ATT Format) (continued)**


---

**Example of an FGB terminating record**

```

HEX ID :AA STRUCT CODE:00653C CALL TYPE:135C
  SENSOR TYPE:036C
SENSOR ID:0000000C REC OFC TYPE:036C REC OFC ID:
  $c01.0000000C DATE:60104C
TIMING IND:00000C STUDY IND:0200000C ANSWER:0C
  SERV OBSERVED:0C
OPER ACTION:0C SERV FEAT:002C OVERSEAS IND:0C
  TERM NPA:00613C
TERM NO:6211234C TIME:1045009C ELAPSED TIME:
  000000028C
IC/INC PREFIX:07772C CC DATE:60104C CC TIME:
  1044546C
ELASPED CC:000000092C IC/INC EVENT:010C TRK GRP:
  00000C ROUTING:0C

```

This feature package modifies the overseas indicator field of the FGB originating and terminating records. The operating company uses this modification to determine the origin of the NPA code in the dialing string for a non-overseas call. The operating company determines if the subscriber dialed the call or if the call derived internally. The system software adds the call.

**Station Message Detail Recording**

The FGB AMA End Office (ATT Format) does not affect Station Message Detail Recording.

**Datafilling office parameters**

The FGB AMA End Office (ATT Format) does not affect office parameters.

**Datafill sequence**

The following table lists the tables that require datafill to implement FGB AMA End Office (ATT Format). The tables appear in the correct entry order.

**FGB AMA End Office (ATT Format)** (continued)

The datafill is set up to display only the translation of the 950-WXXX CAC. This condition occurs because the carrier translates the authorization code and the called number.

**Datafill requirements for FGB AMA End Office (ATT Format)**

<b>Table</b>	<b>Purpose of table</b>
OCCNAME	Table OCCNAME (other common carrier name) lists the connected carriers. This table also establishes the spelling standard for other tables that require the carrier name.
TRKGRP (OC)	Table TRKGRP (trunk group) for OC trunks contains some of the customer-defined data associated with the trunk group that handles local ANI to toll CAMA.
OFRT	Table OFRT (office route) contains route lists to which tables point. These tables are tables other than the home NPA code subtable (HNPACONT.HNPACODE) or the foreign NPA code subtable (FNPACONT.FNPACODE).
OCCINFO	Table OCCINFO (other common carrier information) defines the attributes for the carriers that serve a DMS switch and screens calls for carrier compatibility.
LINEATTR	Table LINEATTR (line attribute) defines the line attribute indexes that apply to an office. Line attributes are assigned to regular lines in table LENLINES. Line attributes are assigned to MDC lines and attendant consoles in table IBXLA.
STDPRTCT	Table STDPRTCT (standard pretranslator control) lists the name of each standard pretranslator subtable defined by the operating company.
STDPRTCT. STDPRT	Subtable STDPRTCT.STDPRT (standard pretranslator) sets up the translations for a specified call type. This subtable is the first subtable indexed by the received leading digits if table LINEATTR or TRKGRP specifies a standard pretranslator subtable name.
AMAOPTS	Table AMAOPTS (AMA options) controls the activation and scheduling of the recording options for local, toll and high-revenue calls.
BCCODES	Table BCCODES (Bellcore codes) allows the operating company to specify which unanswered calls create billing records. If an option is active in table AMAOPTS, a search of table BCCODES occurs for the call code that corresponds. If the code is in table BCCODES, the system creates a billing record for that call.
FGBCIC	Table FGBCIC (FGB CIC) contains carrier names and the four-digit FGB CICs. Data entry for this table with a carrier name and the four-digit CIC that corresponds has the following results. This entry allows 950-XXXX dialing to that carrier and produces a four-digit identification code in the billing record.

**FGB AMA End Office (ATT Format)** (continued)

**Datafilling table OCCNAME**

Datafill for FGB AMA End Office (ATT Format) for table OCCNAME appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table OCCNAME**

Field	Subfield or refinement	Entry	Explanation and action
OCCNAME		Carrier name or 1 to 16 character alphanumeric abbreviation	Other common carrier name. Enter the carrier name or a 1-character to 16-character alphanumeric abbreviation of the carrier name. Enter the reserved carrier name USE_PREVIOUS if the generic recursive pretranslator is used.

**Datafill example for table OCCNAME**

Sample datafill for table OCCNAME appears in the following example.

**MAP example for table OCCNAME**

OCCNAME
C111

**Datafilling table TRKGRP (OC)**

Table TRKGRP (OC) contains some of the customer-defined data associated with the trunk group handling local ANI to toll CAMA. This table has two additional subfields. These subfields are FGBTR AFC and FGBANI. Subfield FGBTR AFC indicates if a two-way OC trunk group connects to an IEC switch and carries FGB calls. Subfield FGBANI defines the format of the ANI spills for FGB calls sent to the carrier.

Table TRKGRP (OC) includes subfield CARRNM identifies the carrier that uses a two-way OC trunk group. This field also sets the IC/INC prefix field of the FGB terminating record, call code 135.

Datafill for FGB AMA End Office (ATT Format) for table TRKGRP (OC) appears in the following table. The fields that apply to FGB AMA End Office

**FGB AMA End Office (ATT Format)** (continued)

(ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table TRKGRP (OC)**

Field	Subfield or refinement	Entry	Explanation and action
	ANITYPE	WK or REV	<p>The ANI request type. Enter the type of ANI request signal. The types of signals are wink (WK) or reversal (REV).</p> <p>The correct ANI fail and answer supervision on the second leg of a remote call forwarding call is a WK ANI request. If the fail and answer supervision is not WK, the ANI request type is a REV.</p>
	BILLSPILL	Y or N	<p>Spill billing. In offices with the Bellcore LAMA format feature and the ANI with the AMA feature, enter the following codes. Enter Y if DD calls that terminate to the trunk group must be recorded in a Bellcore AMA format billing record. If the system does not need to record these calls in a Bellcore AMA format, enter N.</p>
	EA	Y or N	<p>Equal access. Enter Y if the system must send double ANI digits. If the system does not need to send these digits out, enter N.</p>
	FGBTR AFC	Y or N	<p>Feature group B traffic. Enter Y to indicate that a trunk group connects to an IEC switch and the group carries FGB calls. If the trunk group does not connect to an IEC switch, enter N. If you enter Y, you must also enter data for subfields FGBANI and CARRNM.</p>
	FGBANI	Y or N	<p>Feature Group B ANI. If field FGBTR AFC = Y, enter Y to indicate that a normal ANI must be provided. Enter N to indicate that KP+ST is required.</p>
	CARRNM	Carrier name	<p>Carrier name. If FGBTR AFC = Y, enter the name of carrier, as defined in table OCCINFO, with a two-way OC trunk group. The NILC is the default entry.</p>

**Datafill example for table TRKGRP (OC)**

Sample datafill for table TRKGRP (OC) appears in the following example.

**FGB AMA End Office (ATT Format) (continued)**

**MAP example for table TRKGRP (OC)**

```

GRPKEY
                                     GRPINFO
-----
C333FGB2
OC 0 ELO NCRT CA MIDL WK N N 2W NPRT NSCR 619 NLCL CV N N Y Y
CAR1 $
    
```

**Datafilling table OFRT**

Datafill for FGB AMA End Office (ATT Format) for table OFRT appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table OFRT**

Field	Subfield or refinement	Entry	Explanation and action
RTESSEL		CND	Route selector. Enter CND to specify a condition before routing. If the condition is met, execution of the instructions of this route element occurs. If the condition is not met, the system skips the instructions and translation searches for instructions in the next route element.  Conditions that relate to Equal Access follow.
CONDITION		EA	Condition. Enter EA. The operating company can route 10XXX calls differently from non-10XXX calls .
	CNDSEL	EA	Condition selector. Enter EA as the type of condition to test.
	EA_CND_RTE	CAC, INTNL, or PIC	Condition sub-selector. Enter one of the following values: CAC, INTNL, or PIC.

**Datafill example for table OFRT**

Sample datafill for table OFRT appears in the following example.

**FGB AMA End Office (ATT Format)** (continued)

**MAP display example for table OFRT**

RTE	RTELIST
1	CND EA CAC SK 3

**Datafilling table OCCINFO**

Table OCCINFO defines the attributes for carriers that serve the end office and screens calls for carrier compatibility. For example, table OCCINFO allows international traffic to transmit only to carriers that can handle this type of traffic.

Datafill for FGB AMA End Office (ATT Format) for table OCCINFO appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table OCCINFO (Sheet 1 of 5)**

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		Carrier name or 1 to 16 character alphanumeric abbreviation	Carrier name. Enter the carrier name or a 1-character to 16-character alphanumeric abbreviation of the carrier name table OCCNAME defines. Leave this field empty if the generic recursive pretranslator that associates with the reserved carrier name USE_PREVIOUS is used.
CARRNUM		0000 - 9999	Carrier number. Enter the CIC (0000 to 9999).  <b>Note 1:</b> The system accepts a maximum of 256 entries by office.  <b>Note 2:</b> The range of values includes N. Value N is not a correct entry for this field.



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**FGB AMA End Office (ATT Format) (continued)**


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Datafilling table OCCINFO (Sheet 2 of 5)

Field	Subfield or refinement	Entry	Explanation and action
ACCESS		NONE, INTERIM, EAP, OTC, TRANS, FGC	<p>Access arrangement. Enter one of the following access types accepted by the carrier to handle a call:</p> <ul style="list-style-type: none"> <li>• NONE no access</li> <li>• INTERIM interim dialing over FGD signaling</li> <li>• EAP EAP dialing over FGD signaling</li> <li>• OTC FGC dialing over FGC signaling (local billing)</li> <li>• TRANS both interim and EAP dialing over FGD signaling</li> <li>• FGC FGC dialing over FGC signaling (FGD billing)</li> </ul> <p><b>Note 1:</b> In order for the EACARR operational measurement (OM) group to record OM data, this field must be EAP, INTERIM, TRANS or FGC. If the ACCESS field is NONE, the EACARR registers cannot peg.</p> <p><b>Note 2:</b> This field must be NONE for the NILC tuple.</p>
INTER		Y or N	Inter-LATA. Enter Y if the carrier can handle inter-LATA traffic. If the carrier cannot handle inter-LATA traffic, enter N.
INTNTL		Y or N	International. Enter Y if the carrier can handle international traffic. If the carrier cannot handle international traffic, enter N.

**FGB AMA End Office (ATT Format)** (continued)

## Datafilling table OCCINFO (Sheet 3 of 5)

Field	Subfield or refinement	Entry	Explanation and action
INTRA		Y or N	Intra-LATA. Enter Y if the carrier can handle intra-LATA traffic. If the carrier cannot handle intra-LATA traffic, enter N.
ANI		Y or N	Automatic number identification. Enter Y if the carrier wants ANI digits sent with the called number. If the carrier does not want these digits sent, enter N.
FANI		Y or N	Flexible ANI. Enter Y if the carrier can receive flexible ANI information digits instead of standard ANI information digits. If the carrier cannot receive flexible ANI digits, enter N.
ONISCRN		Y or N	Operator number identification screening. Enter Y if ONI traffic requires screening by an operator or CAMA position before outpulsing to the carrier. If the carrier does not require this screening, enter N.
AD1		Y or N	Abbreviated dialing number one. Enter Y if the use of abbreviated dialing accesses the carrier. Enter N if the carrier cannot be assessed.
OVERLAP		Y or N	Overlap. Enter Y if the carrier wants to receive digits from the AT or the EAEO with use of overlap outpulsing. If the carrier does not want to receive these digits, enter N.
INTERS		Y or N	Inter-state. Enter Y if the carrier can handle traffic between states. If the carrier cannot handle traffic between states, enter N.
INTRAS		Y or N	Intra-state. Enter Y if the carrier can handle traffic in the same state. If the carrier cannot handle traffic in the same state, enter N.
TERMREC		LONG or SHORT	Terminating access record. Enter the length (LONG or SHORT) of the terminating access record produced for the carrier. Default value is SHORT.  <b>Note:</b> The system produces access records when the OCCTERM option in table AMAOPTS is ON.

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**FGB AMA End Office (ATT Format) (continued)**


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Datafilling table OCCINFO (Sheet 4 of 5)

Field	Subfield or refinement	Entry	Explanation and action
OCCSEPNO		0 to 127	Other common carrier separation number. Enter the separation number (0 to 127) for the carrier in the Traffic Separations Measurement System.
OPSIG		FGRPC, NONE	Operating signaling. Enter the type of operator signaling provided by the carrier. Enter FGRPC for FGD carriers that require FGC operator signaling. Enter NONE for every other FGD carrier. This entry does not apply to FGC carriers.
PICIND		Y or N	Presubscription indication. Enter Y if the carrier chooses to receive the presubscription indicator. If the carrier does not choose to receive this indicator enter N. This data entry for this field must occur for every entry in table OCCINFO.
DTMFIND		Y or N	Rotary dial/DTMF indicator. Enter Y if the carrier chooses to receive the rotary dial/DTMF indicator on operator service calls that route directly to the carrier. If the carrier does not choose this option, enter N.  <b>Note:</b> Data entered in field DTMFIND must occur for every entry in table OCCINFO. Field DTMFIND is active only if feature package NTX888 is present.
OPSERV		Y or N	Operator services. Enter Y if the carrier accepts EAOSS and does not want the operating company to process 10XXX+0 and 00 calls to the carrier. If the carrier does not accept this option, enter N.  <b>Note:</b> Data entered in field OPSERV must occur for every entry in table OCCINFO. Field OPSERV is active only if feature package NTX888 is present.

**FGB AMA End Office (ATT Format)** (continued)

## Datafilling table OCCINFO (Sheet 5 of 5)

Field	Subfield or refinement	Entry	Explanation and action
CACBLOCK		Y or N	Carrier access code blocking. Enter Y if the carrier wants to block all calls dialed with a CAC. Enter N for every other carrier.  <b>Note:</b> Data entered in field CACBLOCK must occur for every entry in table OCCINFO. Field CACBLOCK is active only if feature package NTX989 is present.
CTDOA		Y or N	Carrier toll denied operator assisted. Enter Y to block OA calls to this carrier when the subscriber has the CTD line option applied for this carrier. If you do not want to block OA calls, enter N. The default value is N.
SCRNWATS		Y or N	Enhanced WATS screening. Enter Y if the carrier wants band screening performed on digits dialed from an enhanced WATS line. If the carrier does not want this option, enter N.  <b>Note:</b> Field SCRNWATS applies when software package NTXA16 is present.
ATPINCL		Y or N	Access transport parameter included. Enter Y to indicate if an access transport parameter must be in IAM going to the IEC. If this option does not have to be included, enter N.
INTRAOPR		Y or N	Intra-LATA operator. Enter Y to indicate if a carrier can handle intra-LATA operator calls. If a carrier cannot handle these calls, enter N.

**Datafill example for table OCCINFO**

Sample datafill for table OCCINFO appears in the following example.

**FGB AMA End Office (ATT Format) (continued)**

**MAP example for table OCCINFO**

```
CARRNAME CARRNUM ACCESS ORIGCARR INTER INTNTL INTRA ANI FANI
ONISCRN AD1 OVERLAP INTERS INTRAS TERMREC OCCSEPNO OPSIG PICIND
NOA950 INCCPN DTMFIND OPSERV CACBLOCK CTDOA CMCMON SCRNWATS
CRMCR A TPINCL INTRAOPR
```

	C111	0111	EAP	Y	Y	Y	N	Y	N
N	Y	Y	Y	Y	LONG	0	FGRPC	Y	
N	N	N	N	N	N	N	N	N	
	Y	N	N						
	C222	0222	EAP	Y	Y	N	Y	N	N
N	N	Y	Y	N	SHORT	0	FGRPC	N	
N	N	N	N	N	N	N	N	N	
	Y	N	N						

**Datafilling table LINEATTR**

Datafill for FGB AMA End Office (ATT Format) for table LINEATTR appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table LINEATTR**

Field	Subfield or refinement	Entry	Explanation and action
LATANM		LATA name	LATAname. Enter the name of the LATA associated with this line attribute.

**Datafill example for table LINEATTR**

Sample datafill for table LINEATTR appears in the following example.

**FGB AMA End Office (ATT Format)** (continued)

**MAP example for table LINEATTR**

```

L A I D X  L C C
          C H G C L S S  C O S T  S C R N C L  L T G  S T S  P R T N M  L C A N A M E  L C A B I L L
          Z E R O M P O S  H O T  T R A F S N O
M R S A  S F C   L A T A N M           M D I           I X N A M E  D G C L N A M E  F A N I D I G S
          R E S I N F
-----
0  1 F R
    N O N E  N T   N S C R      0  6 1 9      P O T 1      L P O T   N
                                     R T E 1   N       0
N I L  N I L S F C  N I L L A T A      0           N I L           N I L       0 0
                                     N
    
```

**Datafilling table STDPRTCT**

Datafill for FGB AMA End Office (ATT Format) for table STDPRTCT appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table STDPRTCT**

Field	Subfield or refinement	Entry	Explanation and action
EXTPRTNM		Pretranslator subtable name	External standard pretranslator subtable name. Enter the name the operating company defines to represent the standard pretranslator subtable. Note that ISUP trunks automatically use standard pretranslator name C7PT on test calls in offices with ISUP capability.

**Datafill example for table STDPRTCT**

Sample datafill for table STDPRTCT appears in the following example.

**MAP example for table STDPRTCT**

```

E X T P R T N M   S T D P R T   A M A P R T
-----
P O T 1           (    1 ) (    1 )
    
```

**Datafilling subtable STDPRTCT.STDPRT**

Subtable STDPRTCT.STDPRT is the first subtable the received leading digits indexes. This action occurs when the originating line attribute or trunk

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**FGB AMA End Office (ATT Format) (continued)**


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specifies a pretranslator name. The originating line attribute is from table LINEATTR. This trunk is from table TRKGRP.

Datafill for FGB AMA End Office (ATT Format) for subtable STDPRTCT.STDPRT appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling subtable STDPRTCT.STDPRT (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric	From digits. Enter the digits to translate. If the entry is a block of consecutive numbers, enter the first number in the block.
TODIGS		numeric	To digits. If FROMDIGS is a block of consecutive numbers, enter the last number in the block. If FROMDIGS is not a block of consecutive numbers, this field equals FROMDIGS.
PRETRTE		see subfields	This field contains the following subfields. Enter these subfields for the FGB selector.
	PRERTSEL	FGB	Pretranslation route selector. Enter FGB to originate FGB calls (950-WXXX dialing).
	TYPCALL	DD, NO, OA	Type of call. Enter the type of call. Enter DD, NO (no prefix), or OA.  <b>Note:</b> Subfield TYPCALL must be DD to allow call billing.
	NOPREDIG	Number of digits 0 - 7	Number of prefix digits. Enter the number of digits (0 to 7) the system interprets as prefix digits. If switching unit arrangement is for CD operation, the number of prefix digits removed from the digit translation must include the CD.
	CARRNAME	Carrier name	Carrier name. Enter the carrier name table OCCNAME defines.
	RTEAREA	see subfields	This subfield contains subfields RTEPRSNT, EXTRTEID, TABID, KEY, MINIDIGSR, and MAXDIGSR.

**FGB AMA End Office (ATT Format)** (continued)

Datafilling subtable STDPRTCT.STDPRT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	RTEPRSNT	Y or N	Route present. Enter Y if the system must send a call to a route from pretranslation. If entry is Y, data entry occurs for the fields that remain.  Enter N if a national translation (table HPNACONT) route must follow. If this route must follow, data for the fields that remain are not entered.
	EXTRTEID	see subfields	External route identifier. This subfield contains subfields TABID and KEY.
	TABID	OFRT	Table name. Enter OFRT. Table OFRT contains the route for the FGB call.
	KEY	0 - 1,023	Index. Enter the index (0 to 1,023) in table OFRT that the call must use for routing.
	MINIDIGSR	1 - 15	Minimum digits received. If field RTEPRSNT = N, leave this field blank. If this field does not equal N, enter the minimum number of digits (1 to 15) to collect before the system routes the call.
	MAXDIGSR	1 - 24	Maximum digits received. If field RTEPRSNT = N, leave this field blank. If this field does not equal N, enter the maximum number of digits (1 to 24) to collect before the system routes the call.

**Datafill example for subtable STDPRTCT.STDPRT**

Sample datafill for subtable STDPRTCT.STDPRT appears in the following example.

**MAP example for subtable STDPRTCT.STDPRT**

FROMDIGS	TODIGS	PRETRTE
00	00	
T OA 1	OFRT 828	2 2 NONE

**Datafilling table AMAOPTS**

Table AMAOPTS controls the activation and scheduling of the recording options for local, toll, and high-revenue calls. This table contains one tuple for



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**FGB AMA End Office (ATT Format) (continued)**


---

every option. A schedule, associated with every option, determines if an option is active, active only at certain times or not active.

Option ENFIA\_B\_C relates to Equal Access billing records. The datafill for FGB AMA End Office (ATT Format) for table AMAOPTS appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table AMAOPTS (Sheet 1 of 3)**

Field	Subfield or refinement	Entry	Explanation and action
OPTION		see subfields	Option. Enter an alphanumeric option code. The following subfields describe options relevant to Equal Access.
	ENFIA_B_C		This option controls the recording of ENFIA_B and ENFIA_C calls (for example, 950-10XX). This option allows the system to record calls on every FGB trunk group.  <b>Note:</b> If an office uses the NT AMA format and the DMS software does not include table AMAOPTS, the system automatically turns option ENFIA_B_C option on.
SCHEDULE		see subfields	Schedule. This field contains subfields AMASEL, ONDATE, OFFDATE, SCHED, ONTIME and OFFTIME.

**FGB AMA End Office (ATT Format)** (continued)

## Datafilling table AMAOPTS (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	AMASEL	ON, OFF, DEFAULT, PERIODIC, TIMED	<p>The AMA selector. Enter one of the following values:</p> <ul style="list-style-type: none"> <li>• ON Activate the option immediately.</li> <li>• OFF Deactivate the option immediately.</li> <li>• DEFAULT Use the default schedule for the option.</li> <li>• PERIODIC Activate the option at the specified date and time. Perform the activity at specified times. Complete subfields ONDATE and ONTIME to specify the date and time for activation. Complete field SCHED for the time intervals to perform the activity.</li> <li>• TIMED Activate the option between the specified dates and times.</li> </ul> <p>For the ENFIA_B_C option, the correct AMA selectors are ON, OFF, TIMED, and DEFAULT. Default is ON.</p>
	ONDATE	YYMMDD	Activation on date. If AMASEL = PERIODIC or TIMED, enter the year, the month, and the day the activation of the option is ON. The format is YYMMDD. If AMASEL does not = PERIODIC, a prompt for this field does occur.
	SCHED	see subfields	Periodic schedule. If AMASEL = PERIODIC, complete the two subfields TU and TV. If AMASEL does not = PERIODIC, a prompt for this subfield does not occur.
	TV	0 - 255	Time value. Enter a value from 0 to 255.
	TU	AEONS, HRS, HUNDREDMS, MINS, SECS, TENMS	Time unit. Enter AEONS, HRS, HUNDREDMS, MINS, SECS or TENMS.

**FGB AMA End Office (ATT Format)** (continued)

Datafilling table AMAOPTS (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	ONTIME	HHMM	Activation on time. If AMASEL = PERIODIC or TIMED, enter the hour and minute the option will activate. The format is HHMM. If AMASEL does not = PERIODIC or TIMED, a prompt for this field does not occur.
	OFFDATE	YYMMDD	Activation off date. If AMASEL = TIMED, enter the year, the month and the day the activation of the option is OFF. The format is YYMMDD. If AMASEL does not = TIMED, a prompt for this field does not occur.
	OFFTIME	HHMM	Activation off time. If AMASEL = TIMED, enter the hour and minute the option deactivates. The format is HHMM. If AMASEL does not = TIMED, a prompt for this field does not occur.

**Datafill example for table AMAOPTS**

Sample datafill for table AMAOPTS appears in the following example.

**MAP example for table AMAOPTS**

OPTION	SCHEDULE
ENFIA_B_C	ON

**Datafilling table BCCODES**

Datafill for FGB AMA End Office (ATT Format) for table BCCODES appears in the following table. The fields that apply to FGB AMA End Office (ATT

**FGB AMA End Office (ATT Format)** (continued)

Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table BCCODES**

Field	Subfield or refinement	Entry	Explanation and action
CALLTYPE		LOCAL, TOLL, HIGHREV, TOPS	<p>Bellcore call type. Enter one of the following Bellcore call types:</p> <ul style="list-style-type: none"> <li>• LOCAL local calls</li> <li>• TOLL toll calls</li> <li>• HIGHREV high-revenue calls</li> <li>• TOPS TOPS calls</li> </ul> <p><b>Note:</b> If the HIGHREV option in table AMAOPTS is ON, the system records every HIGHREV call with a call code defined in table BCCODES. Calls not answered are not recorded when the HIGHREV option in table AMAOPTS is ON.</p>
CODES		Call codes	<p>Bellcore call codes. Enter any combination of the Bellcore call codes. A blank column must separate each call code.</p> <p>Refer to the data schema section of this document for a complete list of Bellcore call codes.</p>

**Datafill example for table BCCODES**

Sample datafill for table BCCODES appears in the following example.

**MAP example for table BCCODES**

CALLTYPE	CODES
LOCAL	(009) (036) (041) (067) (074)\$

---

**FGB AMA End Office (ATT Format) (continued)**


---

**Datafilling table FGBCIC**

This feature package creates table FGBCIC to store four-digit FGB CICs. The key field is the carrier name. The data is the carrier four-digit FGB CIC. Carriers that do not have four-digit FGB codes are not entered in table FGBCIC.

This table cannot be enabled or disabled. If data is not entered in table FGBCIC, billing or translations are not affected. Allocation of store for table FGBCIC occurs with the addition of the first tuple to the table. Store is not wasted if data is not entered in the table. The addition of the first tuple to the table allocates room for 1000 tuples.

Datafill for FGB AMA End Office (ATT Format) for table FGBCIC appears in the following table. The fields that apply to FGB AMA End Office (ATT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table FGBCIC**

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		Carrier name (1 to 16 character alphanumeric)	Carrier name. Enter the 1-character to 16-character alphanumeric name of the carrier. The carrier name must correspond to a carrier name in table OCCINFO or TRKGRP. The carrier name must appear in table OCCNAME to be correct.
FGBNUM		four-digit code	The FGB CIC. Enter the four-digit code associated with the carrier name. The code must contain 4 digits in the range 0 to 9. A NIL value is not correct.  Duplicate CICs are not allowed. This condition prevents problems with reverse mapping of FGB CICs to carrier names.

**Datafill example for table FGBCIC**

Sample datafill for table FGBCIC appears in the following example.

## **FGB AMA End Office (ATT Format)** (continued)

---

### **MAP example for table FGBCIC**

CARRNAME	FGBNUM
CAR1	7772

### **Tools for verifying translations**

The output from TRAVER, used to verify FGB AMA End Office (ATT Format), appears in the following example.

In the TRAVER command that appears in this example:

- L indicates the originator is a line
- 6211235 is the DN that originates the call
- 9502345 is the DN that receives the call
- B indicates that a report on table entries and results must occur

**FGB AMA End Office (ATT Format) (end)****TRAVER output example for FGB AMA End Office (ATT Format)**

```

>TRAVER L 6211235 9502345 B
TABLE LINEATTR
0 1FR NONE NT FR01 0 613 P621 L613 N TSPS N 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 STDPRTCT
P621 ( 1) ( 1)
. SUBTABLE STDPRT
. 9502345 9502345 FGB DD 0 CARB Y OFRT 905 7 7
. . TABLE OFRT
. . 905 N D FGBCAR2W 0 N N
. . EXIT TABLE OFRT
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS:  NON OVRNONE N

+++TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1  FGBCAR2W          9502345      ST

TREATMENT ROUTES.  TREATMENT IS: GNCT
1 T120

+++TRAVER: SUCCESSFUL CALL TRACE +++

```

**SERVORD**

The FGB AMA End Office (ATT Format) does not use SERVORD.

## **FGB AMA End Office (NT Format)**

---

### **Ordering codes**

Functional group ordering code: BAS00003

Functionality ordering code: Not applicable

### **Release applicability**

BCS30 and later versions

### **Requirements**

The FGB AMA End Office (NT Format) does not have requirements.

### **Description**

The FGB AMA End Office Northern Telecom format (NT format) feature package allows the operating company to create billing records. The operating company can create billing records when a carrier uses the operating company network in an FGB access arrangement. A carrier uses the operating company network to provide subscribers with long distance service. The operating company creates two billing records in NT format. These records are one billing record for originating FGB calls and one billing record for terminating FGB calls.

This feature allows the operating company to bill FGB calls that the system routes through an FGB AT, in the end office. The operating company uses LAMA billing to bill FGB calls. The operating company makes the correct call code 134 billing record and ANI digits do not spill to the FGB AT.

### **Operation**

The FGB arrangement allows an EAEO or a non-EAEO to provide subscribers with trunk-side access to an IEC toll network. An FGB carrier uses standard signaling. The LEC bills an FGB carrier according to the current use of FGB facilities. To access an FGB carrier a subscriber must dial

950-WXXX

where

950 is a reserved central office code

W is a filler digit (0-9) that the operating company defines

XXX is the CIC



---

## FGB AMA End Office (NT Format) (continued)

---

This section describes the features for the FGB AMA End Office (NT Format) feature package.

### Billing records for FGB AMA - NT format

This feature package creates the B0 and the B1 billing records in NT format. This feature creates B0 records for originating FGB calls and B1 records for terminating FGB calls. An EE extension entry record accompanies these billing records. The EE extension identifies the trunks used in an FGB call.

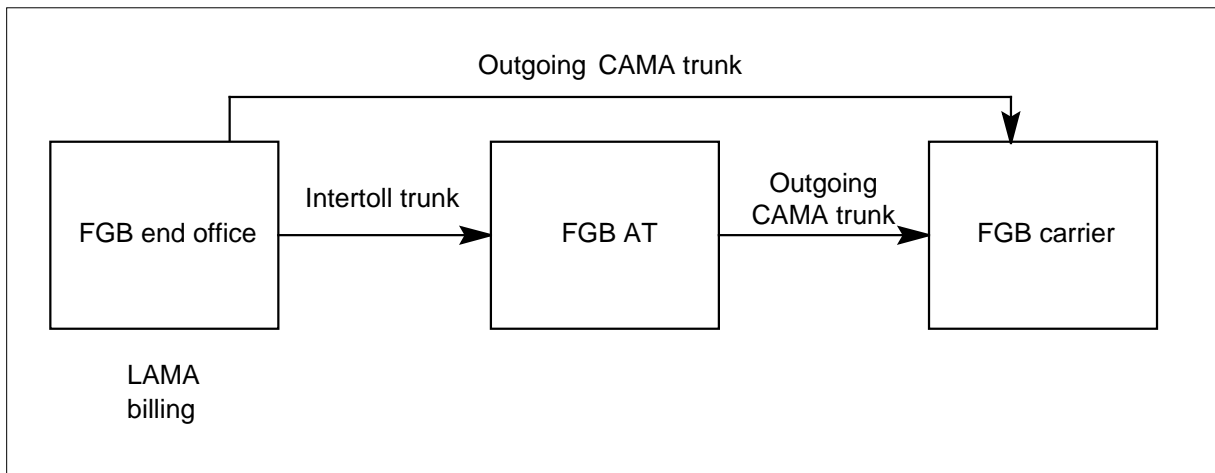
Refer to the billing section in this document for a description of the B0 and the B1 billing records. Refer to the billing section for the EE extension entry record.

### Billing FGB calls from LAMA end office to IEC via AT

Before this feature package, the operating company used CAMA to bill calls that originated at FGB. The system routed the calls through an AT. The operating company billed originating FGB calls at the LAMA end office with direct connections to the FGB carrier. This feature package allows LAMA billing for originating FGB calls. An example of an FGB LAMA configuration appears in the following figure.

*Note:* Terminating FGB calls that use an AT must bill the AT.

#### FGB LAMA configuration



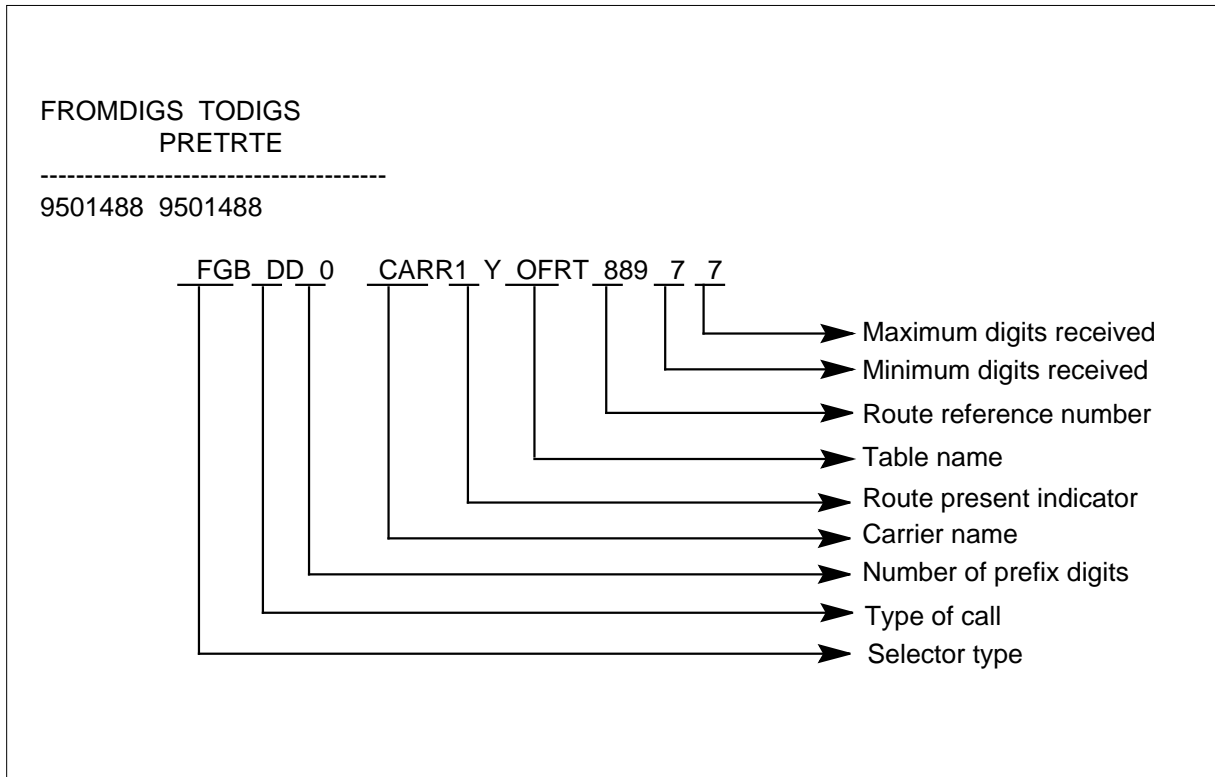
To operate LAMA billing correctly, use the FGB selector in the end office. Use the FGB selector also for the following occurrences:

- in the FGB AT for CAMA billing
- in the FGB end office that uses CAMA billing

## FGB AMA End Office (NT Format) (continued)

Sample datafill for an FGB end office that uses LAMA billing appears in the following figure.

### FGB end office LAMA datafill - subtable STDPRTCT.STDPRT



### Limits

The LAMA billing option applies to originating FGB calls. The operating company must bill terminating FGB calls that use a tandem at the tandem.

### Interactions

The FGB AMA End Office (NT Format) does not have functionality interactions.

### Activation/deactivation by the end user

The FGB AMA End Office (NT Format) does not require activation or deactivation by the end user.

### Billing

The LAMA billing option applies to originating FGB calls. The operating company must bill terminating FGB calls that use a tandem at the tandem.

---

**FGB AMA End Office (NT Format) (continued)**


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The operating company generates B0 and the B1 AMA billing records for each FGB call. The operating company generates B0 billing records for originating FGB calls while the operating company generates B1 billing records for terminating FGB calls. An EE extension entry record accompanies these billing records. The EE extension identifies the trunks used in an FGB call.

A description of the fields in these records follows. A discussion of the fields common to the B0 and the B1 billing records appears first. A discussion of the fields for each record follows. A discussion of the EE extension record is last. Examples of the B0 and the B1 billing records appear in the following figure.

**B0 and B1 billing records**

```

EC CODE!B0 ENTRY CODE!00 INFO DIGS!00 S FEAT CODE!00
CLG NO!6136211234 CLD NO!AAAAAAAA9501488 CC EVENT INFO!4
DAY = 001 TIME! HR = 14 MIN = 22 SEC = 07 ELAPSED TIME =
000008
FG INDICATOR!1 IN/INC PREFIX!4881 CARRIER CONNECT DAY =
001
CC TIME! HR = 14 CC MIN = 22 CC SEC = 07 ELAPSED CC TIME
= 000008
DIALING INDICATOR!3 ANS = Y TANDEM = Y ANI = N

REC CODE!EE SPARE!00 IGRPID!61 OGRPID!566 IMEMID!1
OMEMID!1

REC CODE!B1 ENTRY CODE!00 INFO DIGS!00 S FEAT CODE!00
CLG NO!AAA6211234 CC EVENT INFO!4 DAY = 001 TIME! HR = 14
MIN = 26 SEC = 02 ELAPSED TIME = 000102 FG INDICATOR!1
IN/INC PREFIX!0000 CARRIER CONNECT DAY = 001 CC TIME!
HR = 14 CC MIN = 26 CC SEC = 02 ELAPSED CC TIME = 000102
ANS = Y TANDEM = Y

REC CODE!EE SPARE!00 IGRPID!566 OGRPID!118 IMEMID!1
OMEMID!1

```

**FGB AMA End Office (NT Format)** (continued)

**Fields common to B0 and B1 billing records**

The following fields are common to the B0 and the B1 billing records. Each field name follows the abbreviated form as the form appears on the billing record.

- REC CODE (record code). The two-character entry in this field identifies the billing record type. The entry is B0 or B1.
- ENTRY CODE (entry code). The two-digit entry in this field identifies the call type. The entries in this field range from 00 to 99.
- INFO DIGS (information digit). The two-digit entry in this field provides information that relates to the call.
- S FEAT CODE (service feature code). The two-digit entry in this field identifies the class of service of the calling and called parties.
- CLD NO (called number). The 15-digit entry in this field identifies the called party. If the 15 digits are not required to identify the called party, enter the filler A.
- CC EVENT INFO (carrier event information). The one-character entry in this field provides the following information:
  - if the called party answers the call
  - if the system disconnects the called or calling party
  - if the system tandem routes the call
  - if ANI spill is available

Additional details about this field appear in the following figure.

**Carrier event information**

MEANING	CHARACTER ENTRY															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
-----																
Answered	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
Calling Party Disconnect	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Called Party Disconnect	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Routing (Tandem)	N	N	N	N	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y
ANI	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y

- DAY (day). The three-digit entry in this field identifies the day the subscriber makes a call. The valid entries in this field range from 001 to

---

**FGB AMA End Office (NT Format) (continued)**


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366. For example, 150 indicates that a subscriber makes a call on the 150th day of the year.

- **TIME (time)**. The six-digit entry in this field identifies the hour, minute, and second the subscriber makes a call.
- **ELAPSED TIME (elapsed time)**. The six-digit entry in this field identifies the length of time the carrier remains connected. The system measures the time from carrier connect to carrier disconnect.
- **FG INDICATOR (feature group indicator)**. The one-digit entry in this field indicates the type of call that a subscriber makes. An entry of 1 indicates an FGB call. An entry of 2 indicates an FGD call. In B0 billing records, the entry in this field is 1.
- **IC/INC PREFIX (IC/INC prefix)**. The four-digit entry in this field identifies the carrier access digits and how the digits are obtained. The first three digits represent the carrier access digit. The last digit indicates how the carrier access code is obtained. The valid entries for the fourth digit are:
  - 0 - the prefix is not available
  - 1 - the prefix comes from the dialed digits
  - 2 - the prefix comes from the trunk group data

For B0 billing records, the last digit is always 1. This value indicates that the carrier access digits are obtained from the XXX of the 950-WXXX dialed.

- **CARRIER CONNECT DAY (carrier connect day)**. The three-digit entry in this field indicates the day the carrier was connected. This entry is the same as the entry in the day field.
- **CC TIME (carrier connect time)**. The six-digit entry in this field identifies the hour, minute, and second the carrier was connected. Carrier connect time is the time when the system receives an off-hook from the FGB carrier.
- **ELAPSED CC TIME (elapsed time from carrier connect)**. The six-digit entry in this field indicates the amount of time from carrier connect to carrier disconnect.

**Note:** On originating FGB calls, carrier connect day, carrier connect time, and elapsed time from carrier connect indicates the following time. The time is from carrier off-hook to call disconnect. On terminating FGB calls, carrier connect day, carrier connect time, and elapsed time from carrier connect indicates the following time. The time is from the called party answer, line off-hook, to call disconnect. Carrier connect

## **FGB AMA End Office (NT Format)** (continued)

---

day, carrier connect time, and elapsed time from carrier connect are the same as the answer day, time, and elapsed time entries.

### **Fields for B0 billing records**

The following fields are for the B0 billing record. Each field name follows the abbreviated form as the form appears on the billing record.

- **CLG NO** (calling number). The 10-digit entry in this field identifies the calling number. This field appears after the service feature code field.
- **DIALING INDICATOR** (dialing indicator). The one-digit entry in this field how the subscriber accesses the operating company. The entry is 3 for this feature to indicate that the subscriber dials 950-WXXX. This field appears after the elapsed time from carrier connect field.

The carrier event information field provides information about FGB calls. This field applies to other billing records and the B0 billing record. The carrier event information field provides information on the answer, the routing, and the ANI of an FGB call.

### **Fields for B1 billing records**

The fields that apply to other billing records apply to the B1 billing record. The carrier event information field in the B1 billing record provides information on the answer and routing of an FGB call.

### **EE extension entry record**

An EE extension entry record accompanies each B0 and B1 billing record that the DMS switch generates. An EE extension entry record provides information on the trunks used to route an FGB call. A description of the fields in an EE extension entry record follows. Each field name follows the abbreviated form as the form appears on the billing record.

- **REC CODE** (record code). This field identifies the record. The entry in this field is EE for this feature package.
- **SPARE** (spare). Reserved for future use.
- **IGRPID** (incoming CLLI ID). This field identifies the incoming CLLI or the incoming trunk.
- **OGRPID** (outgoing CLLI ID). This field identifies the outgoing CLLI or outgoing trunk.
- **IMEMID** (incoming member ID). This field identifies the trunk group to which the incoming trunk belongs.
- **OMEMID** (outgoing member ID). This field identifies the trunk group to which the outgoing trunk belongs.

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## FGB AMA End Office (NT Format) (continued)

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### Station Message Detail Recording

The FGB AMA End Office (NT Format) does not affect Station Message Detail Recording.

### Datafilling office parameters

The FGB AMA End Office (NT Format) does not affect office parameters.

### Datafill sequence

The tables that require datafill to implement FGB AMA End Office (NT Format) appear in the following table. The tables appear in the correct entry order.

#### Datafill example for FGB AMA End Office (NT Format)

Table	Purpose of table
CRSFMT	Table CRSFMT (call record stream format) generates billing records in NT format.
LINEATTR	Table LINEATTR (line attribute) defines the line attribute indexes that apply to an office. Line attributes are assigned to standard lines in table LENLINES, and MDC lines and attendant consoles in table IBNXLA.
STDPRTCT	Table STDPRTCT (standard pretranslator control) lists the name of each standard pretranslator subtable that the operating company defines.
STDPRTCT. STDPRT	Subtable STDPRTCT.STDPRT (standard pretranslator) sets up the translations for a specified call type. This subtable is the first subtable that the received leading digits index. The received digits index this subtable if table LINEATTR or TRKGRP specifies a standard pretranslator subtable name.
OFRT	Table OFRT (office route) contains route lists to which tables point. These tables do not include home NPA code subtable (HNPACONT.HNPACODE) or the foreign NPA code subtable (FNPACONT.FNPACODE).
LENFEAT	Table LENFEAT (line feature) lists the features assigned to a specified line in table LENLINES.
OCCINFO	Table OCCINFO (other common carrier information) defines the attributes for the carriers that serve a DMS switch and screens calls for carrier compatibility.
TRKGRP (SC)	Table TRKGRP (trunk group) defines the characteristics for incoming and two-way CAMA trunk groups. These trunk groups are required in a toll or combined local/toll offices.
POSITION	Table POSITION (position) stores the types of positions of the equipped switch and the associated routes.

**FGB AMA End Office (NT Format)** (continued)

**Datafilling table CRSFMT**

Datafill for FGB AMA End Office (NT Format) for table CRSFMT appears in the following table. The fields that apply to FGB AMA End Office (NT Format) appear in this table. See the data schema section of this document for a description of other fields.

**Datafilling table CRSFMT**

Field	Subfield or refinement	Entry	Description
KEY		AMA	Key. Enter AMA, the default value.
FORMAT		NTFMT	Format. Enter NTFMT, the default value, to generate billing records in NT format.  <b>Note:</b> For NT format to be active in an office, a RESTART/RELOAD is required after the modification of the FORMAT field.
DATADUMP		Y or N	Data dump. Enter Y if a data dump of C2C2 records is required. In other occurrences, enter N.  Entry of Y activates package NTX076AA. The package expands the AMA/SMDR record to include the identification of the trunk groups involved in the call. You require extra disk space to store the additional information.
CDRSRCH		NIL_FM	Call detail recording search. You require this field for a DMS-250 switching unit. Enter NIL_FM.
ALARMS		Y or N	Alarms. Enter Y if this stream requires audible alarms for billing failures. In other occurrences, enter N.
TIMERDMP		Y or N	Timer dump. Enter Y to activate the timer dump mechanism. Enter N to deactivate the timer dump. The default value is N.
TIMERVAL		0 to 32767	Timer interval. Enter the time in even seconds (0 to 32767) between timer dumps. The default value is 0.

**Datafill example for table CRSFMT**

Sample datafill for table CRSFMT appear in the following example.



**FGB AMA End Office (NT Format) (continued)**

**MAP example for table CRSFMT**

KEY	FORMAT	DATADUMP	CRDSRCH	ALARMS	TIMERDMP	TIMERV AL
NIL	NTFMT	N	NIL_FM	N	N	0
AMA	BCFMT	N	NIL_FM	Y	N	0
SMDR	SMDRFMT	N	NIL_FM	N	N	0

**Datafilling table LINEATTR**

Datafill for FGB AMA End Office (NT Format) for table LINEATTR appears in the following table. The fields that apply to FGB AMA End Office (NT Format) appear in this table. See the data schema section of this document for a description of other fields.

**Datafilling table LINEATTR**

Field	Subfield or refinement	Entry	Description
LATANM		LATA name	LATA name. Enter the name of the LATA associated with this line attribute.

**Datafill example for table LINEATTR**

Sample datafill for table LINEATTR appears in the following example.

**MAP example for table LINEATTR**

```

LAIDX LCC
      CHGCLSS COST SCRNL LGT STS PRTNM LCANAME LCABILL
                                ZEROMPOS HOT
TRAFFSNO      MRSA SFC  LATANM      MDI      IXNAME
DGCLNAME      FANIDIGS      RESINF
-----
0  1FR
      NONE NT   NSCR    0 619    POT1  LPOT  N
                                RTE1  N
0
NIL NILSFC NILLATA      0      NIL  NIL
00
                                N
    
```

**Datafilling table STDPRTCT**

Datafill for FGB AMA End Office (NT Format) for table STDPRTCT appears in the following table. The fields that apply to FGB AMA End Office (NT

**FGB AMA End Office (NT Format) (continued)**

Format) appear in this table. See the data schema section of this document for a description of other fields.

**Datafilling table STDPRTCT**

Field	Subfield or refinement	Entry	Description
EXTPRTNM		Pretranslator subtable name	External standard pretranslator subtable name. Enter the name that the operating company defines to represent the standard pretranslator subtable. Note the ISUP trunks use the standard pretranslator name C7PT. The ISUP trunks use this name on test calls in offices with ISUP ability.

**Datafill example for table STDPRTCT**

Sample datafill for table STDPRTCT appears in the following example.

**MAP example for table STDPRTCT**

```

EXTPRTNM  STDPRT  AMAPRT
-----
POT1 (    1) (    1)
    
```

**Datafilling subtable STDPRTCT.STDPRT**

Subtable STDPRTCT.STDPRT is the first subtable that the received leading digits index. The leading digits index the subtable when the originating line attribute or trunk specifies a pretranslator name. The originating line attribute is from table LINEATTR. The trunks is from table TRKGRP.

Datafill for FGB AMA End Office (NT Format) for subtable STDPRTCT.STDPRT appears in the following table. The fields that apply to

---

**FGB AMA End Office (NT Format) (continued)**


---

FGB AMA End Office (NT Format) appear in this table. See the data schema section of this document for a description of other fields.

**Datafilling subtable STDPRTCT.STDPRT (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Description
FROMDIGS		numeric	From digits. Enter the digit(s) that the system must translate. If the entry is a block of consecutive numbers, enter the first number in the block.
TODIGS		numeric	To digits. If FROMDIGS is a block of consecutive numbers, enter the last number in the block. In other occurrences, this field equals FROMDIGS.
PRETRTE		see subfields	Pretranslation route. This field contains the following subfields, for data entry for the FGB selector.
	PRERTSEL	FGB	Pretranslation route selector. Enter FGB to originate FGB calls (950-WXXX dialing).
	TYPCALL	DD, NP, OA	Type of call. Enter the type of call: DD, NP (no prefix), or OA.  <b>Note:</b> Set the TYPCALL to DD to assist call billing.
	NOPREDIG	0 to 7	Number of prefix digits. Enter the number of digits (0 to 7) that the system translates as prefix digits. With an arranged for CD operation switching unit, the number of prefix digits for removal from the digit translation must include the CD.
	CARRNAME	Carrier name	Carrier name. Enter the carrier name as table OCCNAME defines.
	RTEAREA	see subfields	Route area. This subfield contains subfields RTEPRSNT, EXTRTEID, TABID, KEY, MINIDIGSR, and MAXDIGSR.

**FGB AMA End Office (NT Format)** (continued)

Datafilling subtable STDPRTCT.STDPRT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Description
	RTEPRSNT	Y or N	Route present. Enter Y if the system must send a call to a route from pretranslation. In this occurrence, enter data in the fields that remain.  Enter N if a national translation (table HPNACONT) route must follow. In this occurrence, do not enter data in the fields that remain.
	EXTRTEID	see subfields	External route identifier. This subfield contains subfields TABID and KEY.
	TABID	OFRT	Table name. Enter OFRT. Table OFRT contains the route for the FGB call.
	KEY	0 to 1023	Index. Enter the index (0 to 1,023) in table OFRT that the call must use to route.
	MINIDIGSR	1 to 15 or blank	Minimum digits received. If field RTEPRSNT = N, leave this field blank. In other occurrences, enter the minimum number of digits (1 to 15) that the system must collect before the system routes the call.
	MAXDIGSR	1 to 24 or blank	Maximum digits received. If field RTEPRSNT = N, leave this field blank. In other occurrences, enter the maximum number of digits (1 to 24) that the system must collect before the system routes the call.

**Datafill example for subtable STDPRTCT.STDPRT**

Sample datafill for subtable STDPRTCT.STDPRT appears in the following example. Each STDPRTCT.STDPRT subtable set arranges the translation for a specified call type. This subtable is the first subtable that the received leading digits index. The received digits index this subtable if table LINEATTR or TRKGRP specifies a standard pretranslator subtable name. In this example, a standard pretranslator name (P621) is present in table LINEATTR.

*Note:* Use the FGB selector at the FGB end office for FGB calls.

The first and second fields define the digits that the system translates at the FGB end office. The last nine fields in this example are called PRETRTE.

---

**FGB AMA End Office (NT Format)** (continued)

---

These fields define the following information:

- selector type
- type of call
- number of prefix digits
- carrier name
- route present indicator
- table name
- route reference number
- minimum number of received digits
- maximum number of received digits

The following characteristics appear in the datafill example:

- The selector is FGB. Use this selector for every FGB call.
- The call type is DD.
- The number of prefix digits is 0.
- The CAR1 is the carrier name table OCCNAME defines.
- The Y indicates that a route is present.
- The OFRT is the name of the table to which the system routes the call.
- The value 1002 is the route reference number assigned to the route list in the OFRT table.
- The last two numbers (7 and 7) represent the minimum and maximum number of digits that the end office must collect. The end office must collect these digits before the end office can transmit information to the AT.

The last five fields in the datafill example define the route for the FGB call. If a route is not specified with the FGB selector, the system uses the home numbering translation route. Table HNPACONT specifies this route.

Sample datafill for subtable STDPRTCT.STDPRT appears in the following example.

**FGB AMA End Office (NT Format)** (continued)

**MAP example for subtable STDPRTCT.STDPRT**

```

FROMDIGS      TODIGS
                PRETRTE
-----
9501488          9501488
      FGB DD 0 CAR1 Y OFRT 1002 7 7 $
    
```

**Datafilling table OFRT**

Table OFRT defines every carrier route and operator service route. These routes are assigned by carrier type, IEC or INC. Each tuple in table OFRT provides the route number and the route list. The route number and route list must include a primary route and can include alternate routes.

Datafill for FGB AMA End Office (NT Format) for table OFRT appears in the following table. Fields that apply to FGB AMA End Office (NT Format) appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table OFRT**

Field	Subfield or refinement	Entry	Description
RTSEL		CND	Route selector. Enter CND to specify a condition before the system routes a call. With the met condition, the system executes the instructions of this route element. In other occurrences, the system skips the instructions and translation looks for instructions in the next route element.  Conditions that relate to Equal Access follow.
CONDITION		EA	Condition. Enter EA to allow the operating company to route 10XXX calls in a different way from non-10XXX calls.
	CNDSEL	EA	Condition selector. Enter EA as the type of condition for testing.
	EA_CND_RTE	CAC, INTNL, PIC	Condition sub-selector. Enter one of the following values: CAC, INTNL, or PIC.

**Datafill example for table OFRT**

Sample datafill for table OFRT appears in the following example.

**FGB AMA End Office (NT Format) (continued)**

**MAP example for table OFRT**

RTE	RTELIST
1	CND EA CAC SK 3

**Datafilling table LENFEAT**

Datafill for FGB AMA End Office (NT Format) for table LENFEAT appear in the following table. The fields that apply to FGB AMA End Office (NT Format) appear in the table. See the data schema section of this document for a description of other fields.

**Datafilling table LENFEAT**

Field	Subfield or refinement	Entry	Description
DF		PIC	Feature. Enter PIC, the feature assigned to the line.
DATA		refer to subfields	Data. This field contains subfields DF, CARRIER, and CHOICE. A blank column must separate each subfield.
	DF	PIC	Feature. Enter PIC, the primary inter-LATA carrier feature.
	CARRIER	Carrier name	Carrier name. Table OCCINFO defines the carrier name to enter. If you require a null PIC, enter NILC.
	CHOICE	Y or N	Choice. If subscribers can choose a carrier, enter Y. If a subscriber must use the assigned carrier, enter N.

**Datafill example for table LENFEAT**

Sample datafill for table LENFEAT appears in the following example.

**MAP example for table LENFEAT**

DATA	LEN	PTY	DF
HOST 00 0 00 02 S			PIC
Y			PIC C111

**FGB AMA End Office (NT Format)** (continued)**Datafilling table OCCINFO**

Table OCCINFO defines the attributes for carriers that serve the EAEO and screens calls for carrier compatibility. For example, table OCCINFO allows the system to send international traffic to carriers that can handle this traffic.

Datafill for FGB AMA End Office (NT Format) for table OCCINFO appear in the following table. The fields that apply to FGB AMA End Office (NT Format) appear in the table. See the data schema section of this document for a description of other fields.

**Datafilling table OCCINFO (Sheet 1 of 5)**

Field	Subfield or refinement	Entry	Description
CARRNAME		Carrier name or 1 to 16 character alphanumeric abbreviation	Carrier name. Enter the carrier name or a 1- to 16-character alphanumeric abbreviation of the carrier name table OCCNAME defines. Leave this field empty if you must use the generic recursive pretranslator associated with the reserved carrier name USE_PREVIOUS.
CARRNUM		0000 to 9999	Carrier number. Enter the CIC (0000 to 9999).  <b>Note 1:</b> This field accepts 256 entries for each office.  <b>Note 2:</b> The range of values include N, but N is not a correct entry for this field.



**FGB AMA End Office (NT Format)** (continued)

Datafilling table OCCINFO (Sheet 2 of 5)

Field	Subfield or refinement	Entry	Description
ACCESS		NONE, INTERIM, EAP, OTC, TRANS, FGC	<p>Access arrangement. Enter one of the following access types that the carrier accepts to handle a call:</p> <ul style="list-style-type: none"> <li>• NONE no access</li> <li>• INTERIM interim dialing over FGD signaling</li> <li>• EAP EAP dialing over FGD signaling</li> <li>• OTC FGC dialing over FGC signaling (local billing)</li> <li>• TRANS interim and EAP dialing over FGD signaling</li> <li>• FGC FGC dialing over FGC signaling (FGD billing)</li> </ul> <p><b>Note 1:</b> For the EACARR operational measurement (OM) group to record OM data, you must set this field to EAP, INTERIM, TRANS, or FGC. If you set the ACCESS field to NONE, the EACARR registers do not increase.</p> <p><b>Note 2:</b> Set this field to NONE for the NILC tuple.</p>
INTER		Y or N	Inter-LATA. Enter Y if the carrier can handle inter-LATA traffic. In other occurrences, enter N.
INTNTL		Y or N	International. Enter Y if the carrier can handle international traffic. In other occurrences, enter N.
INTRA		Y or N	Intra-LATA. Enter Y if the carrier can handle intra-LATA traffic. In other occurrences, enter N.
ANI		Y or N	Automatic number identification. Enter Y if the carrier wants the system to send ANI digits with the called number. In other occurrences, enter N.

**FGB AMA End Office (NT Format)** (continued)

## Datafilling table OCCINFO (Sheet 3 of 5)

Field	Subfield or refinement	Entry	Description
FANI		Y or N	Flexible ANI. Enter Y if the carrier can receive flexible ANI information digits and not standard ANI information digits. In other occurrences, enter N.
ONISCRN		Y or N	Operator number identification screening. Enter Y if ONI traffic requires that an operator perform screening or CAMA position before transmission to the carrier. In other occurrences, enter N.
AD1		Y or N	Abbreviated dialing number one. Enter Y if the system can access the carrier through abbreviated dialing. In other occurrences, enter N.
OVERLAP		Y or N	Overlap. Enter Y if the carrier wants to receive digits from the AT or the EAEO through overlap transmission. In other occurrences, enter N.
INTERS		Y or N	Inter-state. Enter Y if the carrier can handle traffic between states. In other occurrences, enter N.
INTRAS		Y or N	Intra-state. Enter Y if the carrier can handle traffic in the same state. In other occurrences, enter N.
TERMREC		LONG or SHORT	Terminating access record. Enter the length (LONG or SHORT) of the terminating access record that the system produces for the carrier. The default value is SHORT.  <b>Note:</b> The system produces access records when the OCCTERM option in table AMAOPTS is set to ON.
OCCSEPNO		0 to 127	Other common carrier separation number. Enter the separation number (0 to 127) for the carrier in the Traffic Separations Measurement System.
OPSIG		FGRPC, NONE	Operator signaling. Enter the type of operator signaling that the carrier provides. Enter FGRPC for FGD carriers that require FGC operator signaling. Enter NONE for other FGD carriers. The system ignores this entry for FGC carriers.

**FGB AMA End Office (NT Format)** (continued)

Datafilling table OCCINFO (Sheet 4 of 5)

Field	Subfield or refinement	Entry	Description
PICIND		Y or N	Presubscription indication. Enter Y if the carrier chooses to receive the presubscription indicator. In other occurrences, enter N. Enter data in this field for every entry in table OCCINFO.
DTMFIND		Y or N	Rotary dial/DTMF indicator. Enter Y if the carrier chooses to receive the rotary dial/DTMF indicator on operator service calls. The system routes these calls directly to the carrier.  Enter N if the carrier chooses not to receive the rotary dial/DTMF indicator.  <b>Note:</b> Enter data in field DTMFIND for every entry in table OCCINFO. Field DTMFIND is active if feature package NTX888 is present.
OPSERV		Y or N	Operator services. Enter Y if the carrier accepts EAOSS. Enter Y if the carrier does not want the operating company to process 10XXX+0 and 00 calls to the carrier.  Enter N if the carrier does not accept EAOSS. Enter N if the carrier wants the operating company to process 10XXX+0 and 00 calls to the carrier.  <b>Note:</b> Enter data in field OPSERV for every entry in table OCCINFO. Field OPSERV is active if feature package NTX888 is present.
CACBLOCK		Y or N	Carrier access code blocking. Enter Y if the carrier wants to block calls that a subscriber dials with a CAC.  Enter N for other carriers.  <b>Note:</b> Enter data in field CACBLOCK for every entry in table OCCINFO. Field CACBLOCK is active if feature package NTX989 is present.
CTDOA		Y or N	Carrier toll denied OA. Enter Y to block OA calls to this carrier when the subscriber applies the CTD line option to this carrier. In other occurrences, enter N, the default value.

**FGB AMA End Office (NT Format)** (continued)

Datafilling table OCCINFO (Sheet 5 of 5)

Field	Subfield or refinement	Entry	Description
SCRNWATS		Y or N	Enhanced WATS screening. Enter Y if the carrier wants the system to perform band screening. The system performs band screening on digits that a subscriber dials from an enhanced WATS line. In other occurrences, enter N.  <b>Note:</b> The SCRNWATS applies when software package NTXA16 is present.
ATPINCL		Y or N	Access transport parameter. Enter Y to indicate if the initial address message (IAM) that goes to the IEC must include an access transport parameter. In other occurrences, enter N.
INTRAOPR		Y or N	Intra-LATA operator. Enter Y to indicate if a carrier can handle intra-LATA operator calls. In other occurrences, enter N.

**Datafill example for table OCCINFO**

Sample datafill for table OCCINFO appears in the following example.

**MAP example for table OCCINFO**

```
CARRNAME CARRNUM ACCESS ORIGCARR INTER INTNTL INTRA ANI FANI
ONISCRN AD1 OVERLAP INTERS INTRAS TERMREC OCCSEPNO OPSIG PIC1
NOA950 INCCPN DTMFIND OPSERV CACBLOCK CTDOA CMCMON SCRNWATS
CRMCRA ATPINCL INTRAOPR
```

C111	0111	EAP	Y	Y	Y	N	Y	N
N	Y	Y	Y	LONG	0	FGRPC	Y	
N	N	N	N	N	N	N	N	
Y	N	N						
C222	0222	EAP	Y	Y	N	Y	N	N
N	N	Y	Y	SHORT	0	FGRPC	N	
N	N	N	N	N	N	N	N	
Y	N	N						

**Datafilling table TRKGRP (SC)**

Datafill for FGB AMA End Office (NT Format) for table TRKGRP (SC) appear in the following table. The fields that apply to FGB AMA End Office

**FGB AMA End Office (NT Format)** (continued)

(NT Format) appear in this table. See the data schema section of this document for a description of other fields.

**Datafilling table TRKGRP (SC) (Sheet 1 of 7)**

Field	Subfield or refinement	Entry	Description
GRPKEY		see subfield	Group key. This field contains subfield CLLI.
	CLLI	Location identifier	Common language location identifier. Enter the code that represents the trunk group in table CLLI.
GRPINFO		refer to subfields	Variable group data. When GRPTYP = SC, this field contains the following subfields.
	GRPTYP	SC	Group type. Enter the trunk group type SC.
	TRAFSNO	0 to 127	Traffic separation number. Enter the incoming or incoming and outgoing traffic separation number (0 to 127) assigned to the trunk group. If this number is not required, enter 0 (zero).  If the switching unit has the Traffic Separation Peg Count software package, enter 1. Enter 1 to the lower value of parameters TFAN_IN_MAX_NUMBER and TFAN_OUT_MAX_NUMBER in table OFCENG.  For switching units without the Traffic Separation Peg Count software package, enter a number from 1 to 15.  Incoming and outgoing traffic separation numbers 1 to 9 must be reserved for generic traffic separation numbers.
	PADGRP	Pad group	Pad group. Enter the name of the pad group assigned to the trunk group in table PADDATA. Refer to table PADDATA for more information.
	NCCLS	NCRT	Operational measurements no circuit class. Enter NCRT (no circuit). This field is not required for incoming trunk calls.
	TRAFCLS	Traffic usage class	Traffic use class. Enter the traffic usage class assigned to the trunk group. Refer to table TRKGRP for additional information.

**FGB AMA End Office (NT Format)** (continued)

## Datafilling table TRKGRP (SC) (Sheet 2 of 7)

Field	Subfield or refinement	Entry	Description
	ONI	Y or N	Operator number identification. Enter Y when traffic on the trunk group is 100 % ONI traffic. In other occurrences, enter N.
	SNPA	three-digit NPA code	Serving NPA. Enter the three-digit serving NPA code to which the trunk group belongs.  <b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy out the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.
	PRTNM	Standard pretranslator table name	Standard pretranslator table name. If you require standard pretranslation, enter the name of the standard pretranslator table. The system routes the digit translation to this table after the system receives one digit. If pretranslation is not required, enter NPRT.  <b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy out the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.
	NODIGRTE	RTE1, RTE2, RTE3, RTE4, or none	No digit route. Enter the position (RTE1, RTE2, RTE3, or RTE4) in table POSITION to which the system routes calls. If the entry is NONE, the system routes calls to the position CAMA in table POSITION.  <b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy out the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.

**FGB AMA End Office (NT Format)** (continued)

Datafilling table TRKGRP (SC) (Sheet 3 of 7)

Field	Subfield or refinement	Entry	Description
	NODIGCTP	DD, NL, NP, OA	<p>No digit call type. Enter the type of call to assign to calls that do not have incoming digits (seizure):</p> <ul style="list-style-type: none"> <li>• DD direct dial</li> <li>• NL NIL</li> <li>• NP no prefix</li> <li>• OA operator assisted</li> </ul>
	TRTMTSUP	OFFHOOK, ONHOOK, OFFHKWK	Treatment Supervision. Enter the type of supervision required when the system routes translation to a treatment, tone, or announcement. These treatments, tones, or announcements are off-hook (OFFHOOK), on-hook (ONHOOK), or off-hook wink (OFFHKWK).
	NPRETSUP	OFFHOOK, ONHOOK, OFFHKWK	No prefix return supervision. Enter the return supervision required on no prefix type of calls: off-hook (OFFHOOK), on-hook (ONHOOK), or off-hook wink (OFFHKWK).
	NOBILLCD	0 to 63	Number of bill codes. Enter the number of bill codes plus spares (0 to 63) reserved in table BILLCODE.
	ANISEIZ	2 to 30 s	<p>ANI seizure timing. Enter the time in seconds (2 to 30) that the trunk must wait for reception of first ANI digit or signal.</p> <p><b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy out the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.</p>

**FGB AMA End Office (NT Format)** (continued)

Datafilling table TRKGRP (SC) (Sheet 4 of 7)

Field	Subfield or refinement	Entry	Description
	ANIPDIAL	2 to 30 s	<p>ANI partial dialing. Enter the time in seconds (2 to 30) that the trunk must wait for reception of every ANI signal or digit. The trunk waits for reception of every ANI signal or digit except the first.</p> <p><b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy out the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.</p>
	DIR	IC, 2W	<p>Direction. Define the direction of the traffic flow. If the flow is incoming, enter IC. If the flow is two-way, enter 2W.</p> <p><b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy out the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.</p>



**FGB AMA End Office (NT Format)** (continued)

Datafilling table TRKGRP (SC) (Sheet 5 of 7)

Field	Subfield or refinement	Entry	Description
	SELSEQ	MCL, LIDL, MIDL, CWCTH or CCWCTH, ASEQ or DSEQ	<p>Select sequence. Enter MIDL. When the trunk group is incoming, sequential selection does not apply.</p> <p>If the trunk group is two-way (DIR = 2W) and the far end is a link list switcher, enter LIDL or MIDL. The LIDL entry is least idle. The MIDL entry is most idle. Enter LIDL or MIDL when the far end is MIDL or LIDL, in that order.</p> <p>Enter MIDL under the following conditions. The conditions are the trunk group is two-way (DIR = 2W), the far end is not a link list switcher, and sequential selection does not apply.</p> <p>Enter the these entries under the following conditions. The first condition is the trunk group is two-way. The second condition is the far end is not a link list switcher. The third condition is sequential selection applies. This condition indicates the Enhanced Sequential Trunk Hunting software package is present.</p> <ul style="list-style-type: none"> <li>• Enter CWCTH or CCWCTH for clockwise or counterclockwise circular trunk hunting from the most recently released trunk in the trunk group. The order of trunk members in table TRKMEM, when the far end is CCWCTH or CWCTH, in that order, determines the correct entry.</li> <li>• Enter ASEQ or DSEQ for ascending or descending sequential selection. The order of trunk members in table TRKMEM, when the far end is DSEQ or ASEQ, in that order, determines the correct entry.</li> </ul>
	DIGSOUT	0	Digits outputted. Enter 0. This field is for future use.
	SDATA	see subfields	Signaling data. This subfield contains subfield SIGFMT and, if SIGFMT = BELL, of the subfields that follow.

**FGB AMA End Office (NT Format)** (continued)

Datafilling table TRKGRP (SC) (Sheet 6 of 7)

Field	Subfield or refinement	Entry	Description
	SIGFMT	BELL	<p>Signaling format. If two-way or incoming trunk group is from CAMA, specify the signalling format: BELL.</p> <p><b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.</p>
	GRPTYPE	REGULAR, SUPER, OSS	<p>Group type. If the start signal (ST) for DD calls is ST and the system receives one information digit, enter REGULAR.</p> <p>If the start signal for DD calls is ST2P and the system receives one information digit, enter SUPER.</p> <p>If the start signal for DD calls is ST and the system expects two information digits, enter OSS. The OSS option relates to Equal Access calls.</p>
	DEFANIFL	CAMA, TSPS, TREAT	<p>Default ANI fail. This field determines the route translations must take when the system does not receive ANI (ANI FAIL).</p> <p>If the system must route the translation to position CAMA in table POSITION, enter CAMA.</p> <p>If the system must route the translation to position TSPS in table POSITION, enter TSPS.</p> <p>If the system must route the translation to a hard-coded TOLL DENIED treatment, enter TREAT. The system routes this treatment originator to reorder.</p>

**FGB AMA End Office (NT Format)** (continued)

Datafilling table TRKGRP (SC) (Sheet 7 of 7)

Field	Subfield or refinement	Entry	Description
	IC_ROUTE	position, NONE	Independent carrier route. When GRPTYPE = OSS, enter the position, known to table POSITION, field POS. Enter the position to specify the route that the call must take. The call must take a certain route if the start signal identifies the call as an IEC Equal Access call. In other occurrences, enter NONE.
	ANITYPE	WK, REV	ANI request signal. Enter the type of ANI request signal: wink (WK) or reversal (REV).  <b>Note:</b> If you set parameter TRK_OOS_CHK_ON in the variable office parameter table to Y, you must busy the trunks in the group. Busy out the trunks before you change the value of this field by data modification order.
	RECORDNP	Y, N, NP	Record calls of type NP. If the office includes the AT&T AT feature, enter Y or N. Enter Y or N to indicate if the system must record calls of call type NP. In other occurrences, enter NP.
	SPLOOKUP	Y or N	Special lookup. Enter Y under specified conditions. The first condition is the non-EAEO cannot transmit the correct ANI information digit. The second condition is incoming calls on the trunk group require a lookup in table SPLANIN. In other occurrences, enter N.
	OPTIONS	Options	Options. Complete the field OPTION and the corresponding refinements for the desired trunk option.
	OPTION	BCNAME, NOUTR	Option. Correct entries are BCNAME (bearer capability name) or NOUTR (no universal tone receiver).
	NOUTR	NOUTR	No universal tone receiver. Enter NOUTR if the trunk group is to bypass the use of the universal tone receiver (UTR).

## **FGB AMA End Office (NT Format)** (continued)

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### **Datafill example for table TRKGRP (SC)**

Sample datafill for table TRKGRP (SC) appears in the following example. The datafill for an incoming FGB call to the AT on trunk group ICAMDCCM appears in the following example. The call is at the tandem, which must determine additional routing. Table TRKGRP (SC) identifies the incoming trunk and indicates that the system must route the call to standard pretranslation (TCA9).

### **MAP example for table TRKGRP (SC)**

```
GRPKEY  
GRPINFO  
  
ICAMDCCM  
SC 0 TLA NCRT NIL N 518 TCA9 NONE DD ONHOOK  
ONHOOK  
10 5 5 IC  
MIDL 0 BELL REGULAR CAMA CAMA REV Y Y (PIA) (NOUTR)  
(BCNAME SPEECH) $
```

## **Datafilling table POSITION**

Datafill for FGB AMA End Office (NT Format) for table POSITION appears in the following table. The fields that apply to FGB AMA End Office (NT

**FGB AMA End Office (NT Format)** (continued)

Format) appear in this table. Refer to the data schema section of this document for a description of other fields.

**Datafilling table POSITION**

Field	Subfield or refinement	Entry	Description
POS		TOPS, CTOP, CAMA, TSPS, AMAFAIL, AMRX, RTE1, RTE2, RTE3, RTE4, NONE, AOSS, OOC	Type of position. Enter the name assigned to the type of position. For offices that have LAMA, enter CAMA. Enter one of the following entries: <ul style="list-style-type: none"> <li>• TOPS</li> <li>• CTOP</li> <li>• CAMA</li> <li>• TSPS</li> <li>• AMAFAIL</li> <li>• AMRX</li> <li>• RTE1</li> <li>• RTE2</li> <li>• RTE3</li> <li>• RTE4</li> <li>• NONE</li> <li>• AOSS</li> <li>• OOC</li> </ul>
PRTE		see subfields	Position route selector. This field contains subfields PRTESEL and CLLI. Descriptions of these subfields appear in the following lines.
	PRTESEL	S	Position route selector. Enter S if the system must route the translation to a CLLI.
	CLLI	CAMA, TOPS, AOSS	Common language location identifier. Enter the CLLI code assigned to the trunk group to which the system must route the call. Enter CPOS if POS = CAMA. Enter TOPSPOS if POS = TOPS. Enter AOSSPOS if POS = AOSS.

**Datafill example for table POSITION**

Sample datafill for table POSITION appears in the following example.

## **FGB AMA End Office (NT Format) (end)**

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### **MAP example for table POSITION**

POS	PRTE
CAMA	S CPOS

### **Tools for verifying translations**

The FGB AMA End Office (NT Format) does not use tools for verifying translations.

### **SERVORD**

The FGB AMA End Office (NT Format) does not use SERVORD.

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## FGB AMA Tandem (ATT Format)

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### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS33 and later versions

### Requirements

The FGB AMA Tandem (ATT Format) does not have requirements.

### Description

The system generates billing records for calls to Feature Group B (FGB) with the carriers FGB AMA Tandem (ATT Format). This feature makes sure the carrier identification information in these records is correct.

This feature package performs the following functions:

- allows two-way OC trunk groups to access FGB carriers
- generates billing records for FGB calls
- separates FGB CICs from Feature Group D (FGD) CICs
- expands the FGB CIC from three to four digits

### Operation

This feature package, with the appropriate trunking and translations, allows the set up an FGB access arrangement. Networks that support this arrangement allow end offices and access tandems (AT) to provide subscribers with access to FGB carriers. All offices that participate in the network accept FGB dialing and Feature Group C (FGC) signaling. All subscribers that participate in the network must have dual-tone multifrequency telephones. These telephones allow audio tones that represent the dialed digits to pass through the network to the carrier.

This section describes the features for the FGB Automatic Message Accounting (AMA) Tandem (ATT Format) feature package.

#### Generating billing for FGB calls

Table AMAOPTS controls the activation and scheduling of the recording options. This table includes option ENFIA\_B\_C which allows FGB calls to

## **FGB AMA Tandem (ATT Format)** (continued)

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be recorded. The FGB calls are recorded and appropriate billing charges are calculated. The ENFIA\_B\_C is always set to on.

*Note:* An office can use the Northern Telecom (Nortel) AMA format. If the DMS switch software does not include table AMAOPTS, option ENFIA\_B\_C is automatically on.

One tuple is present in table AMAOPTS for each recording option. At first, default values are used for all the options. The default values on the office type are defined as Northern Telecom or Bellcore in office parameter AMA\_FORMAT. Both NT and Bellcore AMA formats are supported for FGB calls.

### **Ensuring the accuracy of billing records**

Table TRKNAME specifies the name of each trunk group in the DMS switch. Table TRKNAME maps each trunk group name to a number in the centralized automatic reporting on trunks database.

Each trunk in the switch must have a different identification. This feature package modifies the table control for table TRKNAME and does not allow duplicate CLLI entries. This modification makes sure the correct carrier is billed. The system software compares the IEC/INC prefix field in the FGB terminating record with the CLLI names in table TRKNAME. The FGB terminating record is call code 135.

### **FGB on two-way trunk groups**

Table TRKGRP for the OC trunk group type defines the characteristics of the outgoing and two-way trunk groups. These trunk groups are from local AMA (LAMA) to centralized AMA (CAMA) trunk groups. This feature package adds subfields FGBTR AFC and FGBANI to this table. With this modification, two-way OC trunks are used to access FGB carriers and generate the AMA records for FGB calls. These trunks provide automatic number identification (ANI) information in the Bellcore CAMA signaling format the carrier requires.

This feature package modifies table TRKGRP with the addition of subfield CARRNM. Subfield CARRNM identifies the carrier with the use of a two-way OC trunk group. This field sets the IC/INC prefix field of the FGB terminating record, call code 135.

The addition of subfield CARRNM to table TRKGRP (OC) makes sure billing is accurate. The digital multiplex system (DMS) switch can verify a correct carrier name in table TRKGRP (OC) while the switch generates billing records. The DMS switch compares subfield CARRNM in this table with field



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**FGB AMA Tandem (ATT Format)** (continued)

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OCCNAME in table OCCNAME. Table OCCNAME contains the names of all carriers that serves the DMS switch.

**FGB CIC expansion**

This feature package expands the CIC for FGB carriers to four digits to allow a standard 950-XXXX FGB carrier access code (CAC). Carriers can use the three-digit CIC.

Table FGBCIC is created to allow the expansion of FGB CICs. This table contains carrier names and their four-digit FGB CICs. Data entered in this table allows 950-XXXX dialing to that carrier and produces a four-digit CIC in the billing record.

This CIC expansion is compatible with the current three-digit CIC design for FGB. Only FGB carriers with four-digit CICs must be entered in table FGBCIC.

The IEC/INC prefix in the billing record is generated as follows:

- For all originating FGB calls, if the carrier name is not entered in table FGBCIC, the system generates the prefix. If the carrier is entered in table FGBCIC, the FGBCIC four-digit code is used.
- For all terminating FGB calls, if the carrier name is not in table FGBCIC, the system generates the prefix. The carrier name is retrieved from the incoming trunk group data. If the carrier is entered in table FGBCIC, the FGBCIC four-digit code is used.

An interexchange carrier (IEC) or international carrier (INC) can perform FGB and FGD signaling with a four-digit access code for FGB. When this condition occurs, table OCCINFO contains the FGD CIC and table FGBCIC is entered with the four-digit FGB CIC.

**Translations table flow**

The FGB AMA Tandem (ATT Format) does not affect the translation process.

## **FGB AMA Tandem (ATT Format)** (continued)

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### **Limits**

The following limits apply to FGB AMA Tandem (ATT Format):

- This feature package affects Bellcore format AMA, but does not affect NT format AMA.
- The traffic operator position system (TOPS) does not support four-digit CICs. The TOPS FGB carrier and translation datafill is not changed and calls use the three-digit CICs.
- The FGB CICs are expanded to four digits but the size of any carrier table does not change. The maximum size of tables OCCNAME, OCCINFO and FGBCIC is 1000 tuples.

### **Interactions**

The FGB AMA Tandem (ATT Format) does not have functionality interactions.

### **Activation/deactivation by the end user**

The FGB AMA Tandem (ATT Format) does not require activation or deactivation by the end user.

### **Billing**

The carrier for originating calls and the local or toll office for terminating calls generates AMA records. Option ENFIA\_B\_C allows for FGB to record calls and generate billing records.

The two types of AMA records generated for FGB calls are FGB originating, call code 134, and FGB terminating, call code 135. Each record provides carrier identification and connect time information. This feature package modifies these call codes. The IEC/INC prefix is changed to allow four-digit CICs for carriers entered in table FGBCIC.

The format of the originating record is like the format of the terminating record. The only difference between the two records is the call code. The following is an example of an FGB terminating record.

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## FGB AMA Tandem (ATT Format) (continued)

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### Example of an FGB terminating record

```

HEX ID :AA STRUCT CODE:00653C CALL TYPE:135C
  SENSOR TYPE:036C
SENSOR ID:0000000C REC OFC TYPE:036C REC OFC ID:
  $c01.0000000C DATE:60104C
TIMING IND:00000C STUDY IND:0200000C ANSWER:0C
  SERV OBSERVED:0C
OPER ACTION:0C SERV FEAT:002C OVERSEAS IND:0C
  TERM NPA:00613C
TERM NO:6211234C TIME:1045009C ELAPSED TIME:
  000000028C
IC/INC PREFIX:07772C CC DATE:60104C CC TIME:
  1044546C
ELASPED CC:000000092C IC/INC EVENT:010C TRK GRP:
  00000C ROUTING:0C

```

This feature package modifies the overseas indicator field of the FGB originating and terminating records. This modification allows the operating company to evaluate a non-overseas call. The operating company determines if the subscriber dialed the numbering plan area (NPA) code in the dialing string or if the NPA is derived internally. The operating company determines if the system software added the NPA.

### Station Message Detail Recording

The FGB AMA Tandem (ATT Format) does not affect Station Message Detail Recording.

### Datafilling office parameters

The FGB AMA Tandem (ATT Format) does not affect office parameters.

### Datafill sequence

The tables that require datafill to implement FGB AMA Tandem (ATT Format) appear in the following table. The tables appear in the correct entry order.

#### Datafill requirements for FGB AMA Tandem (ATT Format) (Sheet 1 of 2)

Table	Purpose of table
OCCNAME	Table OCCNAME (Other Common Carrier Name). This table contains the connected carriers and establishes the spelling standard for other tables that require the carrier name.
TRKGRP (OC)	Table TRKGRP (Trunk Group for OC trunks). This table contains some of the customer data associated with the trunk group handling local ANI to toll CAMA.

**FGB AMA Tandem (ATT Format)** (continued)

**Datafill requirements for FGB AMA Tandem (ATT Format) (Sheet 2 of 2)**

<b>Table</b>	<b>Purpose of table</b>
OFRT	Table OFRT (Office Route). This table contains route lists pointed to from tables other than the home NPA code subtable (HNPACONT.HNPACODE) or the foreign NPA code subtable (FNPACONT.FNPACODE).
OCCINFO	Table OCCINFO (Other Common Carrier Information). This table defines the attributes for the carriers that serve a DMS switch and screens calls for carrier compatibility.
LINEATTR	Table LINEATTR (Line Attribute). This table defines the line attribute indexes that apply to an office. Line attributes are assigned to regular lines in table LENLINES and to MDC lines and attendant consoles in table IBXLA.
STDPRTCT	Table STDPRTCT (Standard Pretranslator Control). This table contains the name of each standard pretranslator subtable that the operating company defines.
STDPRTCT. STDPRT	Subtable STDPRTCT.STDPRT (Standard Pretranslator). This subtable sets up the translations for a specified call type. This subtable is the first subtable the received leading digits index if table LINEATTR or TRKGRP specifies a standard pretranslator subtable name.
AMAOPTS	Table AMAOPTS (AMA Options). This table controls the activation and scheduling of the recording options for local, toll and high-revenue calls.
BCCODES	Table BCCODES (Bellcore Codes). This table allows the operating company to specify which calls that are not answered create billing records. If an option is active in table AMAOPTS, table BCCODES is searched for the call code that corresponds. If the code is in table BCCODES, a billing record for that call that is not answered is created.
FGBCIC	Table FGBCIC (Feature Group B Carrier Identification Code). This table contains carrier names and their four-digit FGB CICs. Enter data in this table with the name of a carrier and the four-digit CIC that corresponds. With this action, 950-XXXX can dial to that carrier and produces a four-digit identification code in the billing record.

**Datafilling table OCCNAME**

Datafill for FGB AMA Tandem (ATT Format) for table OCCNAME appears in the following table. The fields that apply to FGB AMA Tandem (ATT

**FGB AMA Tandem (ATT Format) (continued)**

Format) appear in the table. See the data schema section of this document for a description of the other fields.

**Datafilling table OCCNAME**

Field	Subfield or refinement	Entry	Explanation and action
OCCNAME		Carrier name	Other common carrier name. Enter the carrier name or a 1-character to 16-character alphanumeric abbreviation of the carrier name. You can enter the reserved carrier name USE_PREVIOUS if the generic recursive pretranslator is used.

**Datafill example for table OCCNAME**

Sample datafill for table OCCNAME appears in the following example.

**MAP example for table OCCNAME**

OCCNAME

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C111

**Datafilling table TRKGRP (OC)**

Table TRKGRP (OC) contains some of the customer-defined data associated with the trunk group that handles local ANI to toll CAMA. The additional subfields in table TRKGRP (OC) are FGBTR AFC and FGBANI. Subfield FGBTR AFC indicates if a two-way OC trunk group connects to an IEC switch and carries FGB calls. Subfield FGBANI defines the format of the ANI spills for FGB calls sent to the carrier.

Table TRKGRP (OC) includes subfield CARRNM. Subfield CARRNM identifies the carrier that uses a two-way OC trunk group. This field also sets the IEC/INC prefix field of the FGB terminating record or call code 135.

Datafill for FGB AMA Tandem (ATT Format) for table TRKGRP (OC) appears in the following table. The fields that apply to FGB AMA Tandem

**FGB AMA Tandem (ATT Format)** (continued)

(ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

**Datafilling table TRKGRP (OC)**

Field	Subfield or refinement	Entry	Explanation and action
	ANITYPE	WK, REV	<p>The ANI request type. Enter the type of ANI request signal. The type of signal can be wink (WK) or reversal (REV).</p> <p>The correct ANI fail and answer supervision on the second leg of a remote call forwarding call is a WK ANI request. The other ANI request type is a REV.</p>
	BILLSPILL	Y or N	Spill billing. For use in offices with the Bellcore LAMA format feature and the ANI with the AMA feature. Enter Y if DD calls that terminates to the trunk group are recorded in a Bellcore AMA format billing record. If the DD calls are not recorded, enter N.
	EA	Y or N	Equal access. Enter Y if double ANI digits are sent out. If double ANI digits are not sent out, enter N.
	FGBTR AFC	Y or N	Feature group B traffic. Enter Y to indicate that a trunk group connects to an IEC switch and carries FGB calls. If the trunk group does not perform this action, enter N. If Y is entered, subfields FGBANI and CARRNM must have data entered.
	FGBANI	Y or N	Feature Group B ANI. If field FGBTR AFC = Y, enter Y to indicate that a normal ANI is provided. Enter N to indicate that KP+ST is required.
	CARRNM	Carrier name	Carrier name. If FGBTR AFC = Y, enter the name of carrier, as defined in table OCCINFO. Use a two-way OC trunk group for this function. Entry NILC is the default entry.

**Datafill example for table TRKGRP (OC)**

Sample datafill for table TRKGRP (OC) appears in the following example.

**FGB AMA Tandem (ATT Format)** (continued)

**MAP example for table TRKGRP (OC)**

```

GRPKEY

GRPINFO
-----

C333FGB2
  OC 0 ELO NCRT CA MIDL WK N N 2W NPRT NSCR 619 NLCL CV
N N Y Y
  NILC $
    
```

**Datafilling table OFRT**

Datafill for FGB AMA Tandem (ATT Format) for table OFRT appears in the following table. The fields that apply to FGB AMA Tandem (ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

**Datafilling table OFRT**

Field	Subfield or refinement	Entry	Explanation and action
RTESSEL		CND	Route selector. Enter CND to specify a condition before routing. If the condition is met the instructions of this route element are executed. If the condition is not met, the instructions are skipped and translation looks for instructions in the next route element.  Conditions that relate to Equal Access follow.
CONDITION		EA	Condition. Enter EA to allow the operating company to route 10XXX calls in a different way from non-10XXX calls.
	CNDSEL	EA	Condition selector. Enter EA as the type of condition to test.
	EA_CND_RTE	CAC, INTNL, PIC	Condition sub-selector. Enter one of the following values: <ul style="list-style-type: none"> <li>• CAC</li> <li>• INTNL</li> <li>• PIC</li> </ul>

## FGB AMA Tandem (ATT Format) (continued)

### Datafill example for table OFRT

Sample datafill for table OFRT appears in the following example.

### MAP example for table OFRT

RTE	RTELIST
1	CND EA CAC SK 3

### Datafilling table OCCINFO

Table OCCINFO defines the attributes for carriers that serve the AT and screens calls for carrier compatibility. For example, table OCCINFO allows international traffic to go only to carriers that can handle this traffic.

Datafill for FGB AMA Tandem (ATT Format) for table OCCINFO appears in the following table. The fields that apply to FGB AMA Tandem (ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

#### Datafilling table OCCINFO (Sheet 1 of 5)

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		Carrier name	Carrier name. Enter the carrier name or a 1-character to 16-character alphanumeric abbreviation of the carrier name as defined in table OCCNAME. Leave empty if the generic recursive pretranslator associated with the reserved carrier name USE_PREVIOUS is used.
CARRNUM		0000 to 9999	Carrier number. Enter the CIC (0000 to 9999).  <b>Note 1:</b> Only 256 entries by office are accepted. <b>Note 2:</b> The letter N is in the range of values, N is not a correct entry for this field.



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**FGB AMA Tandem (ATT Format) (continued)**


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Datafilling table OCCINFO (Sheet 2 of 5)

Field	Subfield or refinement	Entry	Explanation and action
ACCESS		NONE, INTERIM, EAP, OTC, TRANS, FGC	<p>Access arrangement</p> <p>Enter one of the following access types, accepted by the carrier, to handle a call:</p> <ul style="list-style-type: none"> <li>• NONE (no access)</li> <li>• INTERIM (interim dialing over FGD signaling)</li> <li>• EAP (EAP dialing over FGD signaling)</li> <li>• OTC (FGC dialing over FGC signaling [local billing])</li> <li>• TRANS (both interim and EAP dialing over FGD signaling)</li> <li>• FGCFGC (dialing over FGC signaling [FGD billing])</li> </ul> <p><b>Note 1:</b> For OM group EACARR to record OM data, this field must be EAP, INTERIM, TRANS or FGC. If field ACCESS is NONE, none of the EACARR registers are increased.</p> <p><b>Note 2:</b> This field must be NONE for the NILC tuple.</p>
INTER		Y or N	Inter-LATA. Enter Y if the carrier can handle inter-LATA traffic. If the carrier cannot handle inter-LATA enter N.
INTNTL		Y or N	International. Enter Y if the carrier can handle international traffic. If the carrier cannot handle international traffic enter N.
INTRA		Y or N	Intra-LATA. Enter Y if the carrier can handle intra-LATA traffic. If the carrier cannot handle intra-LATA traffic enter N.
ANI		Y or N	Automatic number identification. Enter Y if the carrier wants ANI digits sent with the called number. If the carrier does not want ANI digits sent with the called number enter N.

**FGB AMA Tandem (ATT Format)** (continued)

## Datafilling table OCCINFO (Sheet 3 of 5)

Field	Subfield or refinement	Entry	Explanation and action
FANI		Y or N	Flexible ANI. Enter Y if the carrier can receive flexible ANI information digits instead of standard ANI information digits. If the carrier cannot receive flexible ANI information digits instead of standard ANI information digits, enter N.
ONISCRN		Y or N	Operator number identification screening. Enter Y if ONI traffic requires operator screening or CAMA position before the traffic outpulses to the carrier. If ONI traffic does not require operator screening or CAMA position before the traffic outpulses to the carrier, enter N.
AD1		Y or N	Abbreviated dialing number one. Enter Y if the carrier can be accessed with abbreviated dialing. If the carrier cannot be accessed with abbreviated dialing, enter N.
OVERLAP		Y or N	Overlap. Enter Y if the carrier wants to receive digits from the AT or the EAEO with overlap outpulsing. If the carrier does not want to receive digits from the AT or the EAEO with overlap outpulsing, enter N.
INTERS		Y or N	Inter-state. Enter Y if the carrier can handle traffic between states. If the carrier cannot handle traffic between states, enter N.
INTRAS		Y or N	Intra-state. Enter Y if the carrier can handle traffic in the same state. If the carrier cannot handle traffic within the same state, enter N.
TERMREC		Record length	Terminating access record. Enter the length (LONG or SHORT) of the terminating access record produced for the carrier. Default value is SHORT.  <b>Note:</b> Access records are produced only when the OCCTERM option in table AMAOPTS is ON.
OCCSEPNO		0 to 127	Other common carrier separation number. Enter the separation number (0 to 127) for the carrier in the Traffic Separations Measurement System.

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**FGB AMA Tandem (ATT Format) (continued)**


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Datafilling table OCCINFO (Sheet 4 of 5)

Field	Subfield or refinement	Entry	Explanation and action
OPSIG		FGRPC, NONE	Operator signaling. Enter the type of operator signaling the carrier provides. Enter FGRPC for FGD carriers that require FGC operator signaling. Enter NONE for all other FGD carriers. This entry is ignored for FGC carriers.
PICIND		Y or N	Presubscription indication. Enter Y if the carrier chooses to receive the presubscription indicator. If the carrier chooses to not receive the presubscription indicator, enter N. Data must be entered in this field for every entry in table OCCINFO.
DTMFIND		Y or N	Rotary dial/DTMF indicator. Enter Y if the carrier chooses to receive the rotary dial/DTMF indicator on operator service calls routed to the carrier. If the carrier chooses to not receive the rotary dial/DTMF indicator on operator calls routed to the carrier, enter N.  <b>Note:</b> Enter data in field DTMFIND for every entry in table OCCINFO. Field DTMFIND is active only if feature package NTX888 is present.
OPSERV		Y or N	Operator services. Enter Y if the carrier accepts EAOSS and does not want the operating company to process 10XXX+0 and 00 calls to the carrier. If the carrier does not accept EAOSS and does not want the operating company to process 10XXX+0 and 00 calls to the carrier, enter N.  <b>Note:</b> Enter data in field OPSERV for every entry in table OCCINFO. Field OPSERV is active only if feature package NTX888 is present.
CACBLOCK		Y or N	Carrier access code blocking. Enter Y if the carrier wants to block all calls dialed with a CAC. Enter N for all other carriers.  <b>Note:</b> Enter data in field CACBLOCK for every entry in table OCCINFO. Field CACBLOCK is active only if feature package NTX989 is present.

**FGB AMA Tandem (ATT Format)** (continued)

## Datafilling table OCCINFO (Sheet 5 of 5)

Field	Subfield or refinement	Entry	Explanation and action
CTDOA		Y or N	Carrier toll denied operator assisted. Enter Y to block OA calls to this carrier when the subscriber has the CTD line option applied for this carrier. Enter N, the default value, to keep OA calls open.
SCRNWATS		Y or N	Enhanced WATS screening. Enter Y if the carrier wants band screening performed on digits dialed from an enhanced WATS line. If the carrier does not want band screening performed on digits dialed from an enhanced WATS line, enter N.  <b>Note:</b> Field SCRNWATS only applies when software package NTXA16 is present.
ATPINCL		Y or N	Access transport parameter included. Enter Y to indicate if an access transport parameter must be included in the IAM that goes to the IEC. If an access transport parameter is not included in the IAM that goes to the IEC, enter N.
INTRAOPR		Y or N	Intra-LATA operator. Enter Y to indicate if a carrier can handle intra-LATA operator calls. If a carrier cannot handle intra-LATA operator calls, enter N.

**Datafill example for table OCCINFO**

Sample datafill for table OCCINFO appears in the following example.

**FGB AMA Tandem (ATT Format)** (continued)

**MAP example for table OCCINFO**

CARRNAME CARRNUM ACCESS INTER INTNTL INTRA ANI FANI ONISCRN									
AD1 OVERLAP INTERS INTRAS TERMREC IECSEPNO OPSIG PICIND									
NOA950 INCCPN DTMFIND OPSERV CACBLOCK CTDOA CMCMON SCRNWATS									
CRMCRA ATPINCL INTRAOPR									
-----									
	C111	111	EAP	Y	Y	N	Y	N	
N	Y								
	Y	Y	Y	LONG	O	FGRPC		Y	N
	N	N	N	N	N	N		N	
Y									
	N	N							

**Datafilling table LINEATTR**

Datafill for FGB AMA Tandem (ATT Format) for table LINEATTR appears in the following table. The fields that apply to FGB AMA Tandem (ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

**Datafilling table LINEATTR**

Field	Subfield or refinement	Entry	Explanation and action
LATANM		LATA name	LATA name. Enter the name of the LATA associated with this line attribute.

**Datafill example for table LINEATTR**

Sample datafill for table LINEATTR appears in the following example.

**FGB AMA Tandem (ATT Format)** (continued)

**MAP example for table LINEATTR**

```

L A I D X  L C C
          C H G C L S S  C O S T  S C R N C L  L T G  S T S  P R T N M  L C A N A M E  L C A B I L L
                                Z E R O M P O S  H O T  T R A F S N O                M R S A
S F C  L A T A N M                M D I                I X N A M E  D G C L N A M E
F A N I D I G S                R E S I N F
-----
0   1 F R
      N O N E  N T   N S C R      0  6 1 9      P O T 1      L P O T      N
                                           R T E 1
N   0
N I L  N I L S F C  N I L L A T A                0                N I L      N I L
      0 0
                                N
    
```

**Datafilling table STDPRTCT**

Datafill for FGB AMA Tandem (ATT Format) for table STDPRTCT appear in the following table. The fields that apply to FGB AMA Tandem (ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

**Datafilling table STDPRTCT**

Field	Subfield or refinement	Entry	Explanation and action
EXTPRTNM		Standard pretranslator subtable name	External standard pretranslator subtable name. Enter the name that the operating company defines to represent the standard pretranslator subtable. Note that ISUP trunks on test calls in offices with ISUP capability automatically use standard pretranslator name C7PT.

**Datafill example for table STDPRTCT**

Sample datafill for table STDPRTCT appears in the following example.

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**FGB AMA Tandem (ATT Format) (continued)**


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**MAP example for table STDPRTCT**

```

EXTPRRTNM  STDPRT  AMAPRT
-----
POT1 (      1) (      1)

```

**Datafilling subtable STDPRTCT.STDPRT**

Subtable STDPRTCT.STDPRT is the first subtable the received leading digits indexes. This action occurs when the originating line attribute from table LINEATTR or trunk from table TRKGRP specifies a pretranslator name.

Datafill for FGB AMA Tandem (ATT Format) for subtable STDPRTCT.STDPRT appears in the following table. The fields that apply to FGB AMA Tandem (ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

**Datafilling subtable STDPRTCT.STDPRT (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		From digits	From digits. Enter the digits to translate. If the entry is a block of following numbers, enter the first number in the block.
TODIGS		To digits	To digits. If FROMDIGS is a block of consecutive numbers, enter the last number in the block. If FROMDIGS is not a block of consecutive numbers, this field equals FROMDIGS.
PRETRTE		see subfields	Pretranslation route. This field contains the following subfields. Data must be entered in these subfields for the FGB selector.
	PRERTSEL	FGB	Pretranslation route selector. Enter FGB to originate FGB calls (950-WXXX dialing).
	TYPCALL	DD, NP, OA	Type of call. Enter the call type DD, NP or OA.
			<b>Note:</b> Subfield TYPCALL must be DD to allow for call billing.

**FGB AMA Tandem (ATT Format)** (continued)

## Datafilling subtable STDPRTCT.STDPRT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	NOPREDIG	0 to 7	Number of prefix digits. Enter the number of digits, 0 to 7, to be interpreted as prefix digits. The switching unit can be arranged for circle digit (CD) operation. When this action occurs, the CD must be included in the number of prefix digits for removal from the digit translation.
	CARRNAME	Carrier name	Carrier name. Enter the carrier name that table OCCNAME defines.
	RTEAREA	see subfields	Route area. This subfield contains the following subfields.
	RTEPRSNT	Y or N	Route present. Enter Y if a call goes to a route from pretranslation. If a call goes, enter data in all other fields.  Enter N if a national translation (table HPNACONT) route follows. If this event occurs, do not enter data in other fields.
	EXTRTEID	see subfields	External route identifier. This subfield contains subfields TABID and KEY.
	TABID	OFRT	Table name. Enter OFRT. Table OFRT contains the route for the FGB call.
	KEY	0 to 1023	Index. Enter the index (0 to 1023) in table OFRT that the call uses for routing.
	MINIDIGSR	1 to 15	Minimum digits received. If field RTEPRSNT = N, leave this field blank. If this field is not RTEPRSNT = N, enter the minimum number of digits, 1 to 15, to be collected before routing the call.
	MAXDIGSR	1 to 24	Maximum digits received. If field RTEPRSNT = N, leave this field blank. If this field is not RTEPRSNT = N, enter the maximum number of digits, 1 to 24, to be collected before routing the call.

**Datafill example for subtable STDPRTCT.STDPRT**

Sample datafill for subtable STDPRTCT.STDPRT appears in the following example.



**FGB AMA Tandem (ATT Format)** (continued)

**MAP example for subtable STDPRTCT.STDPRT**

FROMDIGS	TODIGS	PRETRTE
00	00	
	T OA 1	OFRT 828 2 2 NONE

**Datafilling table AMAOPTS**

Table AMAOPTS controls the activation and scheduling of the recording options for local, toll and high-revenue calls. Table AMAOPTS contains one tuple for every option. A schedule, associated with every option, defines an option as active, active only at certain times or not active.

Option ENFIA\_B\_C is related to Equal Access billing records. The datafill for FGB AMA Tandem (ATT Format) for table AMAOPTS appears in the following table. The fields that apply to FGB AMA Tandem (ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

**Datafilling table AMAOPTS (Sheet 1 of 3)**

Field	Subfield or refinement	Entry	Explanation and action
OPTION		Option code	Option. Enter an alphanumeric option code. The options important to Equal Access are described in the following subfields.
	ENFIA_B_C		<p>This option controls the recording of ENFIA_B and ENFIA_C calls, for example, 950-10XX. This option allows calls on all FGB trunk groups to be recorded.</p> <p><b>Note:</b> If an office uses the NT AMA format and the DMS switch software does not include table AMAOPTS, option ENFIA_B_C is automatically on.</p>

**FGB AMA Tandem (ATT Format)** (continued)

Datafilling table AMAOPTS (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
SCHEDULE		see subfields	<p>Schedule. This field contains the following subfields:</p> <ul style="list-style-type: none"> <li>• AMASEL</li> <li>• ONDATE</li> <li>• OFFDATE</li> <li>• SCHED</li> <li>• ONTIME</li> <li>• OFFTIME</li> </ul>
	AMASEL	ON, OFF, DEFAULT, PERIODIC, TIMEd	<p>AMA selector. Enter one of the following values:</p> <ul style="list-style-type: none"> <li>• ON Activate the option immediately.</li> <li>• OFF Deactivate the option immediately.</li> <li>• DEFAULT Use the default schedule for the option.</li> <li>• PERIODIC Activate the option at the specified date and time. Perform the periodic activity every few hours or minutes. Complete subfields ONDATE and ONTIME to specify the date and time for activation. Complete field SCHED for the time intervals to perform the activity.</li> <li>• TIMED Activate the option between the specified dates and times.</li> </ul> <p>For option ENFIA_B_C, the correct AMA selectors are ON, OFF, TIMED and DEFAULT. Default is ON.</p>

**FGB AMA Tandem (ATT Format)** (continued)**Datafilling table AMAOPTS (Sheet 3 of 3)**

<b>Field</b>	<b>Subfield or refinement</b>	<b>Entry</b>	<b>Explanation and action</b>
	ONDATE	YYMMDD	Activation on date. If AMASEL = PERIODIC or TIMED, enter the year, the month and the day on which the activation of the option is set to ON. The format is YYMMDD. If this action does not occur, a prompt for this field is not present.
	SCHED	see subfields	Periodic schedule. If AMASEL = PERIODIC, complete the two subfields TU and TV. If this action does not occur, a prompt for this subfield is not present.
	TV	0 to 255	Time value. Enter a value from 0 to 255.
	TU	AEONS, HRS, HUNDREDM S, MINS, SECS, TENMS	Time unit. Enter AEONS, HRS, HUNDREDMS, MINS, SECS or TENMS.
	ONTIME	HHMM	Activation on time. If AMASEL = PERIODIC or TIMED, enter the hour and minute that the option activates. The format is HHMM. If this action does not occur, a prompt for this field is not present.
	OFFDATE	YYMMDD	Activation off date. If AMASEL = TIMED, enter the year, the month, and the day on which the activation of the option is set to OFF. The format is YYMMDD. If this action does not occur, a prompt for this field is not present.
	OFFTIME	HHMM	Activation off time. If AMASEL = TIMED, enter the hour and minute that the option deactivates. The format is HHMM. If this action does not occur, a prompt for this field is not present.

**Datafill example for table AMAOPTS**

Sample datafill for table AMAOPTS appears in the following example.

## FGB AMA Tandem (ATT Format) (continued)

### MAP example for table AMAOPTS

OPTION	SCHEDULE
ENFIA_B_C	ON

## Datafilling table BCCODES

Datafill for FGB AMA Tandem (ATT Format) for table BCCODES appears in the following table. The fields that apply to FGB AMA Tandem (ATT Format) appear in the table. See the data schema section of this document for a description of the other fields.

### Datafilling table BCCODES

Field	Subfield or refinement	Entry	Explanation and action
CALLTYPE		LOCAL, TOLL, HIGHREV, TOPS	<p>Bellcore call type. Enter one of the following Bellcore call types:</p> <ul style="list-style-type: none"> <li>• LOCAL (local calls)</li> <li>• TOLL (toll calls)</li> <li>• HIGHREV (high-revenue calls)</li> <li>• TOPS (TOPS calls)</li> </ul> <p><b>Note:</b> If option HIGHREV in table AMAOPTS is ON, all HIGHREV calls with a call code table BCCODES defines are recorded. Calls that are not answered are not recorded when option HIGHREV in table AMAOPTS is ON.</p>
CODES		Call codes	<p>Bellcore call codes. Enter any group of the Bellcore call codes. A blank column must separate each call code.</p> <p>Refer to the data schema section of this document for a complete list of Bellcore call codes.</p>

### Datafill example for table BCCODES

Sample datafill for table BCCODES appears in the following example.

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**FGB AMA Tandem (ATT Format)** (continued)

---

**MAP example for table BCCODES**

CALLTYPE	CODES
LOCAL	(009) (036) (041) (067) (074)\$

**Datafilling table FGBCIC**

This feature package creates table FGBCIC to store four-digit FGB CICs. The key field is the carrier name. The data is the carrier four-digit FGB CIC. Carriers that do not have four-digit FGB codes are not entered in table FGBCIC.

This table cannot be enabled or disabled. If table FGBCIC is not entered with data billing or translations are not affected. Store for table FGBCIC is allocated when the first tuple is added to the table. Store is not wasted if the table is not entered. When the first tuple is added to the table, room for 1000 tuples is allocated.

Datafill for FGB AMA Tandem (ATT Format) for table FGBCIC appears in the following table. The fields that apply to FGB AMA Tandem (ATT Format)

## FGB AMA Tandem (ATT Format) (continued)

appear in the table. See the data schema section of this document for a description of the other fields.

### Datafilling table FGBCIC

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		Carrier name	Carrier name. Enter the 1-character to 16-character alphanumeric carrier name. The carrier name must correspond to a carrier name in table OCCINFO or TRKGRP. The carrier name must appear in table OCCNAME to be correct.
FGBNUM		4-digit code	FGB CIC. Enter the four-digit code associated with the carrier name. The code must contain 4 digits in the range 0 to 9. A NIL value is not correct and causes an error message.  Copy of CICs is not allowed. This action prevents problems with reverse mapping of FGB CICs to carrier names. Any attempt to enter a carrier with a earlier used CIC causes an error message.

### Datafill example for table FGBCIC

Sample datafill for table FGBCIC appears in the following example.

### MAP example for table FGBCIC

CARRNAME	FGBNUM
CAR1	7772

## Tools for verifying translations

The output from TRAVER when the output verifies FGB AMA Tandem (ATT Format) appears in the following example.

In the TRAVER command in this example, the following appears:

- L indicates the originator is a line
- 6211235 is the DN originating the call
- 9502345 is the DN receiving the call
- B indicates that a report on both table entries and results is desired

**FGB AMA Tandem (ATT Format) (end)****TRAVER output example for FGB AMA Tandem (ATT Format)**

```

>TRAVER L 6211235 9502345 B
TABLE LINEATTR
0 1FR NONE NT FR01 0 613 P621 L613 N TSPS N 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 STDPRTCT
P621 ( 1) ( 1)
. SUBTABLE STDPRT
. 9502345 9502345 FGB DD 0 CARB Y OFRT 905 7 7
. . TABLE OFRT
. . 905 N D FGBCAR2W 0 N N
. . EXIT TABLE OFRT
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS:  NON OVRNONE N

+++TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1  FGBCAR2W          9502345      ST

TREATMENT ROUTES.  TREATMENT IS: GNCT
1 T120

+++TRAVER: SUCCESSFUL CALL TRACE +++

```

**SERVORD**

The FGB AMA Tandem (ATT Format) does not use SERVORD.

## Flexible Bellcore AMA

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS34 and later versions

### Requirements

Flexible Bellcore AMA does not have requirements.

### Description

The NTX737AB package contains Bellcore AMA features. These features allow the operating company to generate AMA records identified by call codes. The AMA pretranslation generates these call codes.

The NTX737AB package allows the operating company to generate call codes 088, 100 and 999 based on AMA pretranslation. Call code 088 are non-directory support 555 records. Call codes 800 to 999 are generic records.

Flexible Bellcore AMA allows NTX098AA or NTX159AA Universal Bellcore Centrex Billing (NC0267) customers to enter data for option FLEXCTYP. This option is in tables AMAXLAID and FLEXAMA. The customers can enter GENERIC and NONDA555 call types for option FLEXCTYP. The NTX737AB also provides NCO267 with the ability to use the FLEXSF options in table AMAXLAID and table FLEXAMA. Refer to Bellcore CAMA Format (NTX098AA) and Bellcore LAMA Format (NTX159AA) for an explanation of feature NCO267.

The generic call codes (800 to 999) can override all other non-TOPS call codes. The generic call codes replace the call code value with a value from 800 to 999.

This package also allows the operating company to fill the service feature (SERV FEAT) field of any non-TOPS AMA record with values. These values must be between 800 and 999. The operating company uses AMA pretranslation to fill the SERV FEAT field.

**Note:** The AMA pretranslation applies to Meridian Digital Centrex (MDC) and plain ordinary telephone service (POTS).



---

**Flexible Bellcore AMA** (continued)

---

**AMA pretranslation datafill overview**

The operating company can generate the following call codes with the use of AMA pretranslation:

**call code 009**

411 directory assistance

**call code 033**

555 directory assistance

**call code 088**

non-directory assistance 555 calls

**call code 121**

Datapath terminating access record

**call codes 800 to 999**

generic record

*Note:* The operating company can generate call codes 009 and 033 for IBN DD calls only with the use of AMA pretranslation.

The operating company must satisfy the following conditions to generate call codes 009 and 033:

- the DA411 and CHG411, and/or DA555 and CHG555 options are in the ON position in table AMAOPTS
- the subscriber dials 411 or 555-1212

*Note:* The operating company can generate call codes 088, 121, and 800 to 999 only with the use of AMA pretranslation. The operating company can generate call code 009 for local directory assistance calls other than 411 with the use of AMA pretranslation.

**Call code 088 (non-directory assistance 555 calls)**

An AMA record identified by call code 088 provides details for calls to 555-XXXX other than 555-1212. The operating company generates call code 088 with the use of AMA pretranslation. The AMA pretranslation process occurs when the received leading digits of the called number access subtable AMAPRT.

The system supports the following structure codes for call code 088:

**00500**

high runner

**00001**

answered

## **Flexible Bellcore AMA (continued)**

---

Use subtable AMAPRT to ent01r data for call code 088 for AMA pretranslation. When you enter data for code 088, you can fill the service feature field of the generated AMA record. You can fill this field with a value from 800 to 999. The system allows this capability for all non-TOPS calls. The entry value replaces any current value in the SERV FEAT field of the AMA record.

### **Call codes 800 to 999 (generic record)**

The operating company can use call codes 800 to 999 for any non-TOPS call. The received leading digits and the datafill in subtable AMAPRT are the standard for pretranslation.

When field CALLCODE in subtable AMAPRT has the entry GENERIC, you can enter a call code value (800 to 999). If you enter a call code value, determines if that value overrides the generation of other call codes.

### **Override active**

Override is in effect when OVERRIDE is set to Y in subtable AMAPRT. When override is active and you dial the digits entered for AMA pretranslation, an AMA record results. The AMA record is the record of the structure code that the system normally generates. A call code entry value is in field GENRCVAL in subtable AMAPRT. This call code value entry replaces the call code that the system normally generates in the AMA record.

### **Override inactive**

Override is not in effect when OVERRIDE is set to N in subtable AMAPRT. When override is not active, a call code hierarchy is in effect. The system only generates AMA records identified by call codes 800 to 999 when other billings (except call codes 006 and 067) do not apply. The system generates the 800 to 999 values for call codes 006 or 067 for non-TOPS calls.

The enhanced capability of AMA pretranslation allows non-TOPS call-generated structure codes to associate with call codes 800 to 999. The AMA pretranslation process does not affect the structure codes associated with the following types of AMA records:

- TOPS
- tracer
- overflow
- time change
- signaling irregularities

---

**Flexible Bellcore AMA** (continued)

---

**Other call codes that use AMA pretranslation**

The NTX737AB feature package allows the operating company to enter data in the SERV FEAT field in non-TOPS call-generated AMA records. The operating company uses subtable AMAPRT to enter the data. The values that you can enter are 800 to 999. The datafill in field SFEATVAL, subtable AMAPRT replace current values already generated for the SERV FEAT field of the AMA record.

*Note:* If the AMA record does not contain a service feature field, the datafill in field SFEATVAL does not have an effect. The datafill does not force the generation of a record structure that contains the service feature field.

**Subscriber/system interactions**

Other call attributes, like equal access, also contribute to the generation of a call code. In these occurrences, if subfield OVERRIDE equals N, generation of call codes other than those entered in AMA pretranslation occurs.

Some special services associated with a call, like call forwarding, also fill the service feature field in an AMA record. The service feature field value entered in subtable AMAPRT replaces the value that normally generates. This action occurs when AMA pretranslation is in use to route a call.

The datafill of a service feature field value does not force a billing record to generate. Some Bellcore AMA structure codes do not contain a service feature field. The SFEATVAL datafill in subtable AMAPRT does not affect the AMA record when billing records do not generate. This datafill also does not affect the AMA record if a service feature field is not present in the AMA record.

The operating company is responsible for correct datafill.

**Operation**

If the datafill and routing results specify that billing must occur for a call, the system generates a Bellcore AMA record. The system generates the record with the use of fixed and current translation schema.

**Standard translations datafill**

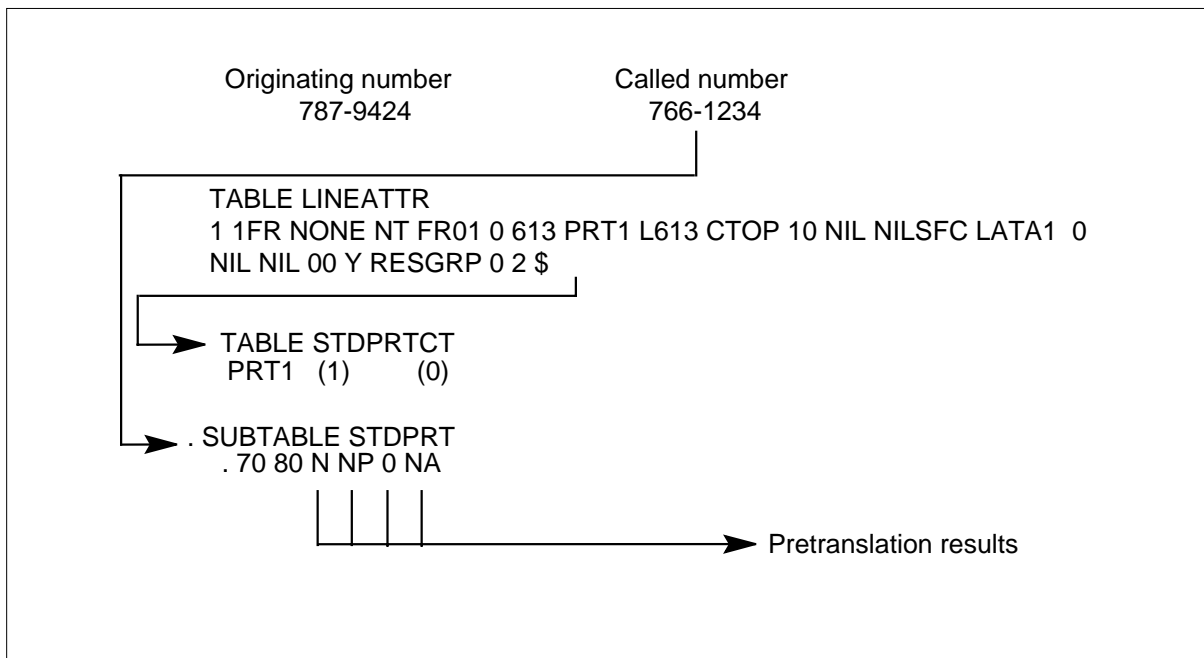
Each operating company can enter a maximum of 256 pretranslator names in table STDPRTCT. The originating line (table LINEATTR) or trunk group (table TRKGRP) contains the attribute that indexes into table STDPRTCT. The attribute is in the pretranslator name (PRTNM) field of tables LINEATTR and TRKGRP.

**Flexible Bellcore AMA** (continued)

Each pretranslator entered in table STDPRTCT has a corresponding subtable STDPRT tuple. The received leading digits of the called number index subtable STDPRT.

In the following figure, pretranslator name PRT1, assigned in field PRTNM, is in use to index in table STDPRTCT. Pretranslation only occurs when the PRTNM field of table TRKGRP or table LINEATTR specifies a pretranslator name.

**Table indexing for standard pretranslation**



The indexing of the pretranslator entered with data in table LINEATTR to index table STDPRTCT appears in this figure. The leading digit of the called number indexes into subtable STDPRT. Indexing appears for an originating line, 787-9424, that dials 766-1234. This example uses the Translation & Routing Verification (TRAVER) utility.

The pretranslation results for the originating line (787-9424) that dials 766-1234 are: N NP 0 NA. Subtable STDPRT uses the digits dialed (the leading digit is 7) to determine that the user cannot receive a bill for this call (NP). The system does not generate an AMA record for this call because the call cannot be billed.

**Note:** The leading digits can change before the indexing to subtable STDPRT. If the leading digits change, the digits may never index subtable

**Flexible Bellcore AMA** (continued)

STDPRT. Refer to the data schema section of this document for detailed explanations of table STDPRTCT and associated subtables.

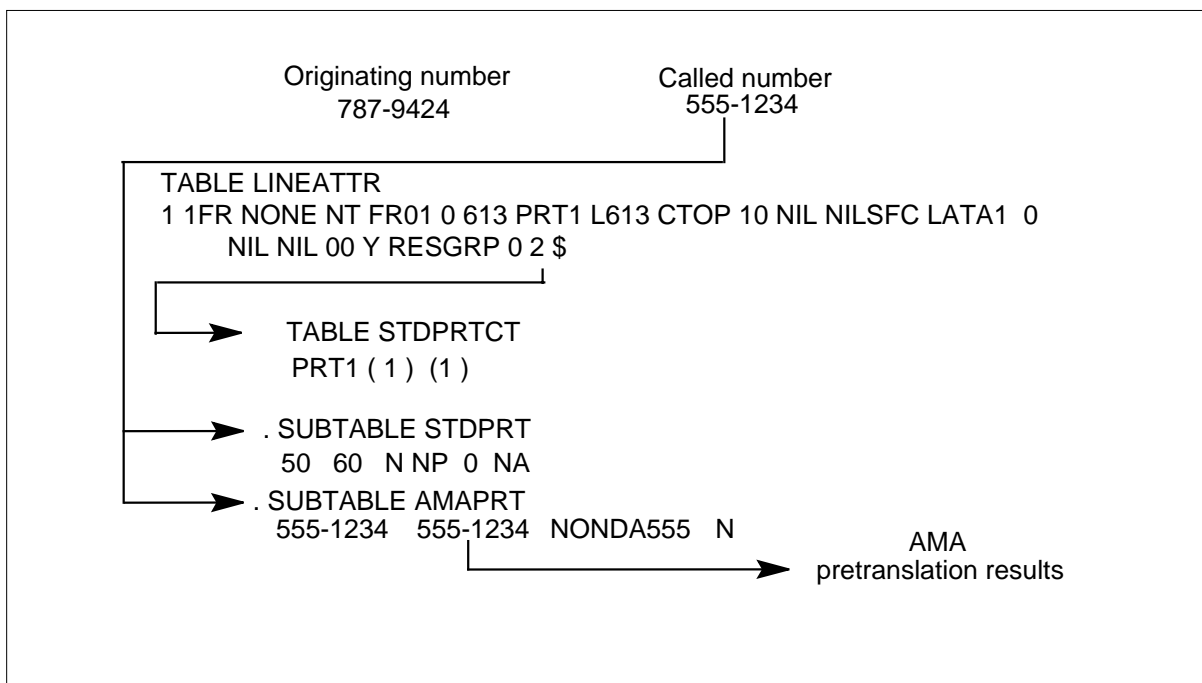
**AMA pretranslation**

The leading digits of the called number determine the accessible tuples in subtables STDPRT and AMAPRT. Information contained in the tuple generates the correct call code. If the leading digits are in subtable AMAPRT, generation of the call code associated with the AMARSLT field, subfield CALLCODE, occurs. Other call attributes, like Equal Access, can override AMAPRT call code generation.

The FROMDIGS and TODIGS fields in subtable AMAPRT specify the range of leading digits for translation. The AMARSLT field represents the AMA pretranslation results. The result is the generated call code.

Digits in the FROMDIGS and TODIGS fields can differ between subtable STDPRT and subtable AMAPRT. The operating company can enter AMA pretranslation results separately from standard pretranslation results.

An indexing design appears in the following figure. The indexing design is for both subtable STDPRT and AMAPRT when the originating line (787-9421) dials 555-1234. The indexing into subtable AMAPRT represents the AMA pretranslation stage. The following figure uses the TRAVER utility.

**Table indexing for AMA pretranslation**

**Flexible Bellcore AMA** (continued)

The system uses subtable STDPRT datafill 50 60 N NP 0 NA to translate called numbers with the leading digits 50, 51, 52, 53 ... 59, 60. The NP indication indicates that the call cannot be billed. As the called number is a non-directory-assisted 555 number, the system generates call code 088 (NONDA555) in subtable AMAPRT.

The system needs the datafill in subtable AMAPRT to generate an 088 AMA record.

*Note:* The AMA pretranslation only dictates the generation of a Bellcore AMA call code.

The AMA pretranslation uses the pretranslator name specified in table LINEATTR or table TRKGRP. For example, datafill in subtable STDPRT can cause indexing into table STDPRTCT again. This indexing can have a new pretranslator name. The AMA pretranslation uses only the first pretranslator name used to index table STDPRTCT.

*Note:* Subtable AMAPRT is not entered for the received leading digits. In this event, AMA pretranslation does not have an effect on the call code generated.

The possible AMARSLT, subfield CALLCODE, entries appear in the following table. The call codes generated for each entry when the feature packages listed are present in the switch appear in the following table.

**Call codes generated for AMARSLT datafill**

AMARSLT call code	Call code generated	Feature package required
None	No effect on call code	NTX159AA and NTX737AB
DA411	Call code 009	NTX159AA
DA555	Call code 033	NTX159AA
NONDA555	Call code 088	NTX159AA and NTX737AB
Datapath	Call code 121	NTX159AA
800 to 900	Call codes 800 to 999	NTX159AA and NTX737AB

*Note 1:* For the DMS-200, substitute package NTX098AA for package NTX159AA.

**Flexible Bellcore AMA** (continued)

**Note 2:** The system only can generate call codes 088 and 800 to 999 if the NTX737AB and the NTX159AA or NTX098AA feature packages are present.

**CALLCODE not equal to GENERIC**

Correct entries for the CALLCODE field in subtable AMAPRT are as follows:

- NONE
- DA411
- DA555
- NONDA555
- Datapath

When you enter any of these values, the table editor prompts the you to enter the SFPRSNT (service feature present) field. The following items determine the call codes generated:

- the value entered in CALLCODE
- the digits dialed
- the call code hierarchy defined for the DMS

Sample datafill for the generation of call codes 088, 033, 009 and 121 appears in the following table. You can enter value NONE in the AMARSLT, subfield CALLCODE, field. Only perform this action to replace the service feature field in the generated AMA record with a value from 800 to 999.

When OVERRIDE is set to N, a call code hierarchy applies. Generic call codes can override call codes 006 and 067 only.

**Subtable AMAPRT datafill when CALLCODE is not equal to GENERIC**

FROMDIGS	TODIGS	AMARSLT	
15551212	15551212		DA555 N
15551234	15551234		NONDA555 N
1800	1800	GENERIC 800	N OVRNONE N
3511001	3511001	GENERIC 811	N OVRNONE N
411	411		DA411 N
15551212	15551212	Datapath	Y 800

## Flexible Bellcore AMA (continued)

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### **CALLCODE is equal to GENERIC**

When the CALLCODE field is equal to GENERIC, the table editor prompts you. You must enter the GENRCVAL (generic value) and OVERRIDE (override) subfields. Correct entries for the GENRCVAL field are values between 800 and 999. These values are the call codes for the AMA record generated.

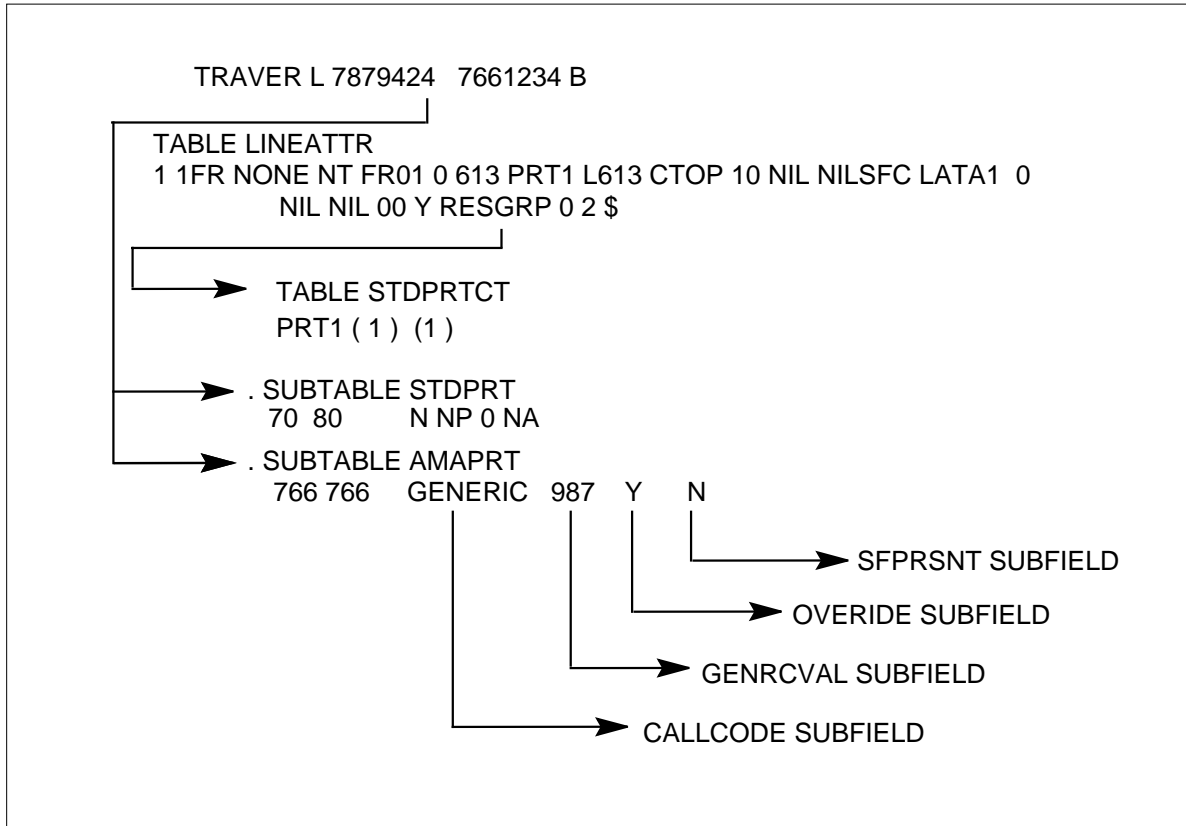
Correct entries for the OVERRIDE field are Y and N. This subfield affects the call code generation hierarchy. The override option allows the operating company to replace the call code in any non-TOPS call-generated AMA record. The operating company cannot replace the record structure. A non-TOPS call generated record includes all other record types except TOPS, tracer, overflow, time change and signaling irregularities.

Before the BCS25 version, the generic call codes only overrode call codes 006 and 067. The BCS25 version allows the generic call code to override any Bellcore non-TOPS call code when OVERRIDE is set to Y. For example, a paid call of an originating inter-LATA station normally produces call code 110 and structure code 00625. GENRCVAL is 855 and OVERRIDE is Y for an originating inter-LATA station paid call. In this event, call code 855 with structure code 00625 generates.

*Note:* The CALLCODE field value is not a GENERIC value. In this event, the table editor does not prompt for values for the GENRCVAL or OVERRIDE subfields.

An example of the BCS25 AMAPRT datafill that specifies the generation of generic call code 987 appears below. This example uses the TRAVER utility.



**Flexible Bellcore AMA** (continued)**Generic datafill in AMA pretranslator using TRAVER****Additional generic values**

This feature package introduced additional generic values in BCS25. Additional call codes are 806 to 999. The system generates these call codes when the CALLCODE subfield is set to GENERIC. The GENRCVAL subfield must have an entry value between 806 and 999.

Before the BCS25 version, AMA pretranslation supported the generic call codes 800 to 805. Before the BCS25 version, the call codes generated when AMARSLT was set to CC800, CC801, CC802, CC803, CC804 or CC805. With the expanded AMA pretranslation capability, values CC800-CC805 are no longer valid. Now, call codes 800-805 generate when the CALLCODE field is GENERIC and the GENRCVAL field value is between 800 and 805.

**Service feature present (SFPRSNT) field datafill**

The operating company can fill the SERV FEAT field of non-TOPS call generated AMA records with a value from 800 to 999. The SERV FEAT field indicates any special services associated with a call.

## Flexible Bellcore AMA (continued)

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A Bellcore AMA record with a service feature field value of 008 appears in the following example. The value 008 indicates Inward Wide Area Telephone Service (INWATS).

### Example of Bellcore AMA record with service feature field

```
HEX ID:AA STRUCT CODE:00120C CALL TYPE: 001C SENSOR TYPE:036C
SENSOR ID:0000000C REC OFC TYPE:036C REC OFC ID: 0000000C
DATE:70720C TIMING IND: 00100C STUDY IND:0200000C ANSWER: 0C
SERV OBSERVED:0C OPER ACTION:0C SERV FEAT:008C ORIG NPA:613C
ORIG NO:6211092C OVERSEAS IND:3C TERM NPA:00000C
TERM NO:7871234C CONN TIME:1136091C ELAPSED TIME: 000012390C
WATS IND:0C WATS BAND IND:020C PRESENT DATE:70307C
PRESENT TIME:1704429C
```

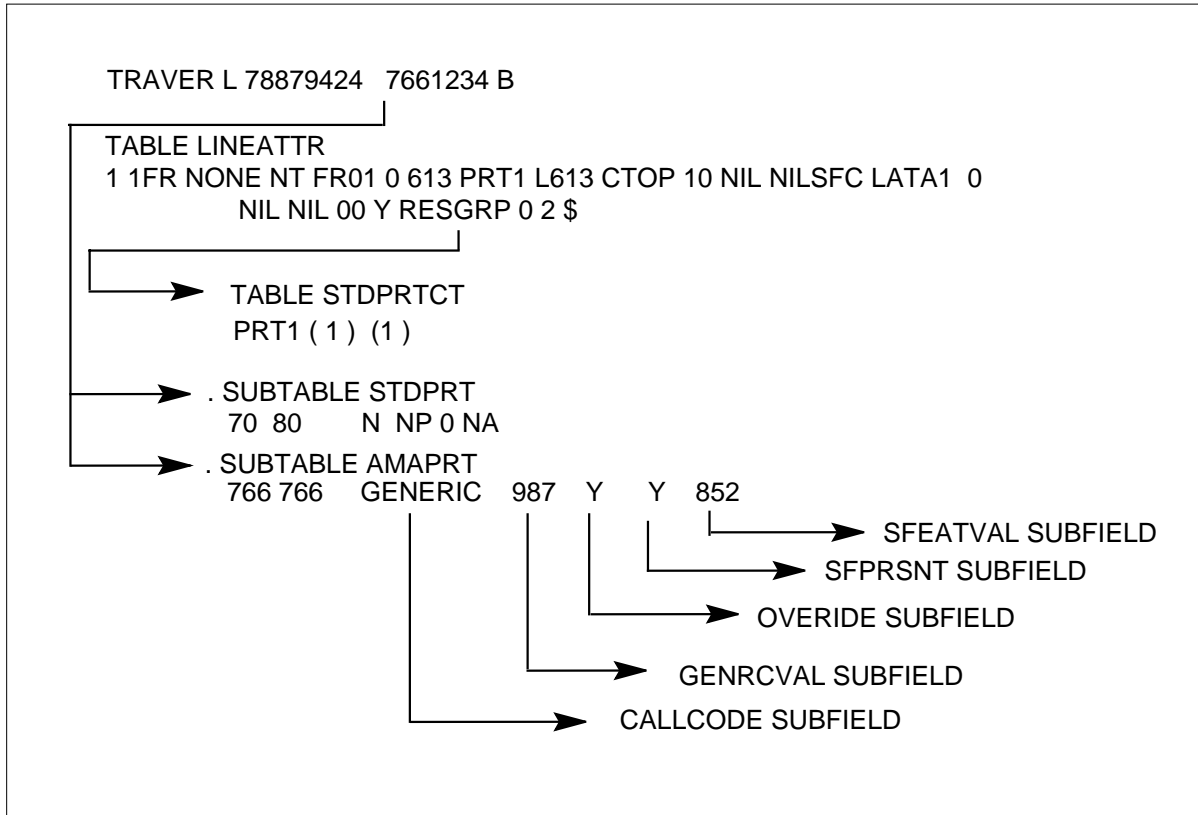
The Flexible Bellcore AMA package supports the service feature field values between 800 and 999. These values are set through the SFPRSNT subfield in subtable AMAPRT. When Y is specified in the SFPRSNT subfield, you must enter a value in another subfield SFEATVAL from 800 to 999. These values are the numeric values that appear in the SERV FEAT field of the AMA record. The value of the entered data in subtable AMAPRT overrides any other value that normally generates.

For example, the SERV FEAT field of the AMA record generated can have a 999 value instead of an 008 value. This condition occurs if AMA pretranslation routes an INWATS call. The service feature value 999 must be in field SFEATVAL of subtable AMAPRT for this condition to occur.

When N is the entry for the SFPRSNT subfield, an effect on the SERV FEAT field in the AMA record does not occur.

An example of the AMAPRT datafill appears in the following figure. This datafill specifies the generation of call code 987 and a service feature field value of 852. This example uses the TRAVER utility.

**Note:** A value in the SFEATVAL field does not force the generation of a structure code that contains a service feature field. Subtable AMAPRT datafill only affects the value of the field when the structure code contains a service feature field.

**Flexible Bellcore AMA** (continued)**Example datafill for service feature field using TRAVER****Tools for verifying translations**

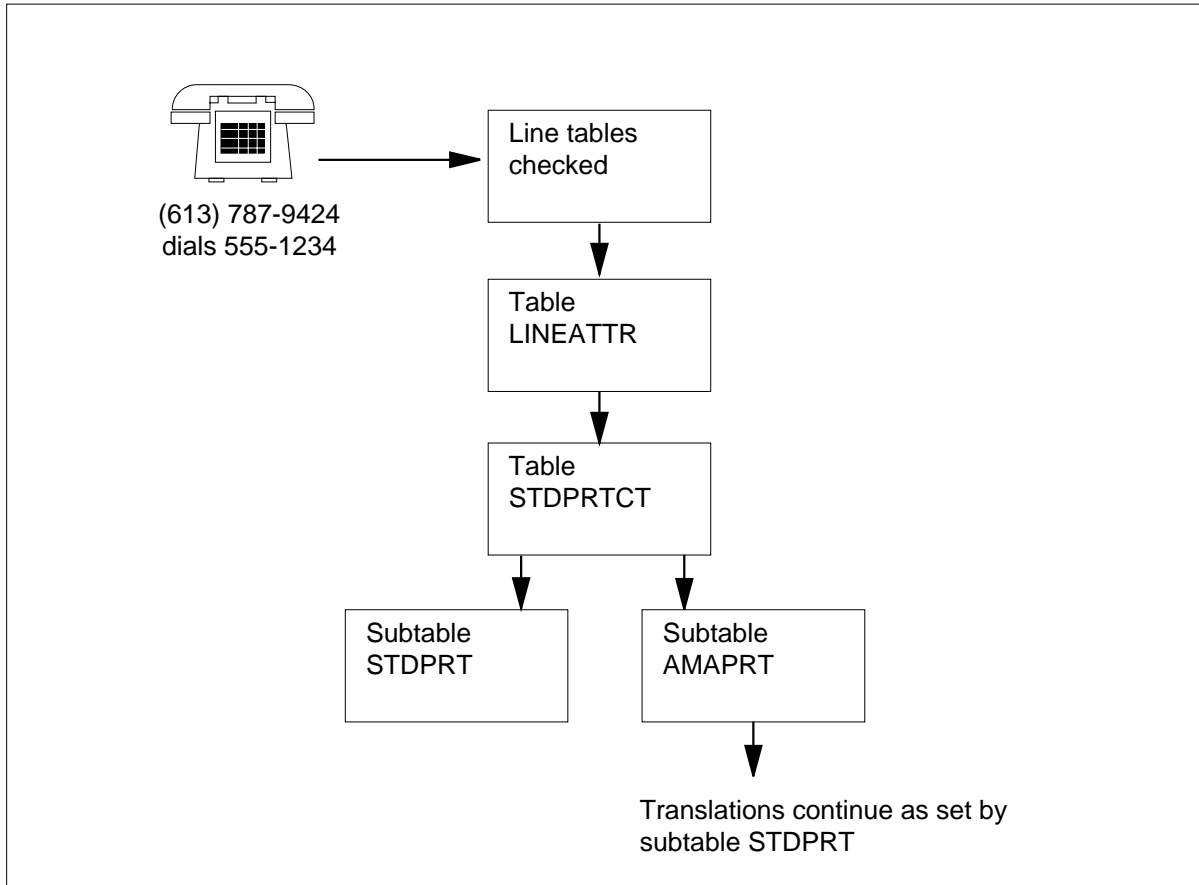
A description of the Flexible Bellcore AMA translations tables appear in the following:

- Table LINEATTR determines the indexing into screening tables. Table LINEATTR first defines the type of line that generates the call.
- Table STDPRTCT sets the type of call that is processed (NP, DD, OA) and performs other functions related to call routing and screening. Screening into table STDPRTCT is from field PRTNM in table LINEATTR.
- The leading digits of the number dialed determine the indexing of subtable STDPRT. If leading digits are present, table STDPRTCT sets the call type. Leading digits can be stripped, and routing is set to continue translations.
- The leading digits of the number dialed determine the indexing of subtable AMAPRT. If the leading digits are present, the system generates Bellcore AMA records.

The Flexible Bellcore AMA translation process appears in the following flowchart.

## Flexible Bellcore AMA (continued)

Table flow for Flexible Bellcore AMA



The datafill content used in the flowchart appears in the following table.  
Customer A uses (613) 787-9424, dials 555-1234 and generates call code 088.

Datafill example for Flexible Bellcore AMA

Datafill table	Example data
LINEATTR	1 1FR NONE NT FR01 0 613 PRT1 L613 CTOP 10 NIL LATA1 0 NIL NIL 00 Y RESGRP 0 2 \$
STDPRTCT	PRT1 ( 1) ( 1)
STDPRTCT. STDPRT	50 60 N NP 0 NA
STDPRTCT. AMAPRT	5551234 5551234 NONDA555 N

---

**Flexible Bellcore AMA** (continued)

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**Description of translations progression**

The previous translations flow as follows:

- From line (613) 787-9424, dial 555-1234.
- Index into table LINEATTR from line tables and position on line attribute index number 1.
- From table LINEATTR, index into table STDPRTCT and position on pretranslator name specified in table LINEATTR.
- From table STDPRTCT, index into subtable STDPRT and position on leading digits dialed (555). The tuple associated with this number sets the call type as No prefix (NP) or local. The tuple routes the call to table HNPACONT with an N and NA selector. The tuple indicates that the number dialed did not include a prefix digit like 0 or 1.
- Index into subtable AMAPRT and position on leading digits dialed (5551234). The tuple associated with this number indicates that the call is a non-directory support 555 call. This type of call requires the generation of an AMA record. The call code generated is 088.
- Translations continue as set by subtable STDPRT.

**Limits**

The limits that apply to Flexible Bellcore AMA appear below.

**Non-TOPS call codes not supported**

The NTX737AB supports all non-TOPS call codes except for the following:

- tracer (090, 092)
- overflow (037, 071, 120)
- time change (042)

See the "Description" section of this document for an explanation of the call codes supported by NTX737AB.

**Call codes not generated**

Call codes entered for AMA pretranslation do not generate for the following reasons:

- Table LINEATTR and table TRKGRP do not specify a pretranslator in the PRTNM field.
- The leading digits of the called number change before the digits index into subtable STDPRT.
- When subfield OVERRIDE in subtable AMAPRT equals N, other attributes cause the generation of a call code. This call code is not the call code

## **Flexible Bellcore AMA** (continued)

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specified in subtable AMAPRT. Equal access (EA) is an example of another attribute that causes the generation of a call code. The EA call codes have higher priorities than call codes 088, 009, 033, or 800 to 999.

- When subfield OVERRIDE equals Y, the generic call code values entered have priority over any non-TOPS call-generated record.

### **Supported trunk groups**

The NTX737AB supports the following trunk groups:

- superCAMA (SC) and CAMA (OC)
- access to carrier (ATC)
- P2 trunk (P2)
- PX trunk (PX)
- IBN trunks (IBNTI and IBNT2)

### **Interactions**

The following paragraph describes the actions between Flexible Bellcore AMA and other functionalities.

Flexible Bellcore AMA allows Universal Bellcore Centrex Billing (NC0267) customers with NTX098AA or NTX159AA to enter data for option FLEXCTYP. Option FLEXCTYP is in tables AMAXLAID and FLEXAMA. The customers can enter option FLEXCTYP with GENERIC and NONDA555 call types. The NTX737AB also allows NCO267 to use the FLEXSF options in table AMAXLAID and table FLEXAMA. Refer to the Bellcore CAMA Format (NTX098AA) and Bellcore LAMA Format (NTX159AA) for an explanation of feature NCO267.

### **Activation/deactivation by the end user**

Activation of NTX737AB is immediate if subtable AMAPRT contains the correct values. Make sure that a change to this subtable occurred to improve

**Flexible Bellcore AMA** (continued)

the subtable from the NTX737AA to the NTX737AB feature package. The changes in values for subtable AMAPRT appear in the following table.

**Subtable AMAPRT (Sheet 1 of 2)**

Pre-BCS25 datafill	BCS25 datafill
1. DA411	CALLCODE =DA411 SFPRSNT= N
2. DA555	CALLCODE =DA555 SFPRSNT=N
3. NONDA555	CALLCODE =NONDA555 SFPRSNT=N
4. Datapath	CALLCODE =Datapath SFPRSNT=N
5. CC800	CALLCODE =GENERIC GENRCVAL =800 OVERRIDE=N GENERIC SFPRSNT=N
6. CC801	CALLCODE =GENERIC GENRCVAL =801 OVERRIDE=N SFPRSNT=N
7. CC802	CALLCODE =GENERIC GENRCVAL =802 OVERRIDE=N SFPRSNT=N
7. CC802	CALLCODE =GENERIC GENRCVAL =802 OVERRIDE=N SFPRSNT=N

**Flexible Bellcore AMA** (continued)

**Subtable AMAPRT (Sheet 2 of 2)**

Pre-BCS25 datafill	BCS25 datafill
8. CC803	CALLCODE =GENERIC GENRCVAL =803 OVERRIDE=N SFPRSNT=N
9. CC804	CALLCODE =GENERIC GENRCVAL =804 OVERRIDE=N SFPRSN =N
10. CC805	CALLCODE =GENERIC GENRCVAL =805 OVERRIDE=N SFPRSNT =N

**Billing**

The use of AMA pretranslation generates call codes 088 and 800 to 999. The call codes and associated structure codes are as follows:

- Call code 088, 555 non-directory assistance

This call code is for calls routed to 555-xxxx other than 555-1212. The system supports the following structure codes for call code 088:

**00500**  
high runner

**00001**  
answered

Record structures 00500 and 00001 contain the service feature field. Data entries are requirements to change the values normally generated. Enter the digits dialed in subtable AMAPRT. Enter NONDA555 and a service feature value of 800 to 999 in the CALLCODE field.

- Call codes 800 to 999, generic record

The operating company can use these call codes for operating company purposes. Any non-TOPS structure code that the DMS generates can be associated with call codes 800 to 999. When the call code hierarchy applies, the system only generates call codes 800 to 999 when other billings do not apply. The exception to this rule is the billing of call codes



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**Flexible Bellcore AMA** (continued)

---

006 and 067. When OVERRIDE equals Y in subtable AMAPRT, the system generates the expected structure code. The call code is the same as the datafill in the GENRCVAL field.

Billing is in accordance with Bellcore AMA format.

An AMA record generated for call code 088 appears in the following example.

**Call code 088**

```
HEX ID:AA STRUCT CODE:10500C CALL TYPE: 088C SENSOR TYPE:036C
SENSOR ID:0000000C REC OFC TYPE:036C REC OFC ID: 0000000C
DATE:60101C ANSWER: 0C SERV FEAT:000C ORIG NPA:613C
ORIG NO:6211234C OVERSEAS IND:1C TERM NPA:00613C
TERM NO:6211241C CONN TIME:221011C ELAPSED TIME: 000000000C
CIRCUIT ID:7000612C
```

An AMA record generated for call code 800 appears in the following example.

**Call code 800**

```
HEX ID:AA STRUCT CODE:20101C CALL TYPE: 800C SENSOR TYPE:036C
SENSOR ID:0000000C REC OFC TYPE:036C REC OFC ID: 0000000C
DATE:60101C TIMING IND: 00200C STUDY IND:0220000C ANSWER: 0C
SERV OBSERVED:0C OPER ACTION:0C SERV FEAT:000C ORIG NPA:613C
ORIG NO:7224121C OVERSEAS IND:1C TERM NPA:00613C
TERM NO:6211234C CONN TIME:1159448C ELAPSED TIME: 001440000C
CIRCUIT DATE:60102C CIRCUIT TIME:1359564C SIG DIGS NEXT:005C
```

**Station Message Detail Recording**

Flexible Bellcore AMA does not affect Station Message Detail Recording.

**Datafilling office parameters**

Flexible Bellcore AMA does not affect office parameters.

**Flexible Bellcore AMA** (continued)

**Datafill sequence**

The subtable that requires datafill to implement Flexible Bellcore AMA appears in the following table.

**Datafill requirements for Flexible Bellcore AMA**

Subtable	Purpose of subtable
STDPRTCT. AMAPRT	AMA Pretranslator Subtable. This subtable generates call codes 009, 033, 088, 121, and 800 to 999 with the use of AMA pretranslation

**Datafilling subtable AMAPRT**

Datafill for Flexible Bellcore AMA for subtable AMAPRT appears in the following table. The fields that apply directly to Flexible Bellcore AMA appear in this table. See the data schema section of this document for a description of the other fields

**Datafilling subtable AMAPRT (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		a maximum of 18 digits	From digits. Enter a maximum of 18 digits for translation. If the entry represents a block of sequential numbers, enter the first number in the block.
TODIGS		numeric	To digits. Enter the same numbers as in the FROMDIGS field. If FROMDIGS represents a block of sequential numbers, enter the last number of the block in this field.
AMARSLT		see subfields	AMA results. Contains subfields CALLCODE and SFPRSNT. Descriptions of these subfields follow.
	CALLCODE	NONE, DA411, DA555, NONDA555, Datapath or GENERIC	Call code. Enter NONE if a change must not occur to the generated call code.  Enter DA411, DA555, NONDA555 or Datapath to generate an AMA record of a specific call code.  Enter GENERIC to generate other call codes.
	GENRCVAL	800 to 999	Generic values. If GENERIC is the entry in the CALLCODE field, enter a value from 800 to 999.
	OVRIDIC	see subfield	Override IC AMA records. The subfield displays Y if the call code that results is IC or GENERIC.

**Flexible Bellcore AMA** (continued)

Datafilling subtable AMAPRT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	OVRIDLT	see subfield	Override non-IC AMA records (local/toll).
	SFPRSNT	Y or N	Service feature present. Enter N to prevent the replacement of the current service feature field value.  Enter Y to replace the current service feature field value with the value entered in the SFEATVAL field.
	SFEATVAL	800 to 999	Service feature value. If Y is the entry in the SFPRSNT field, enter a service feature value (800 to 999). If the call is non-TOPS, this value replaces any current service feature value for the call.  If N is the entry in the SFPRSNT field, a prompt for this field does not appear.

**Datafill example for subtable AMAPRT**

Sample datafill for subtable AMAPRT appears in the following example.

**MAP example for subtable AMAPRT**

FROMDIGS	TODIGS	AMARSLT
15551212	15551212	DA555 N
15551234	15551234	NONDA555 N
1800	1800	GENERIC 800 N OVRNONE N
3511001	3511001	GENERIC 811 N OVRNONE N
411	411	DA411 N
15551212	15551212	Datapath Y 800

**Tools for verifying translations**

The output from TRAVER when TRAVER verifies Flexible Bellcore AMA appears in the following example. This example represents only one of several possible TRAVER results. The results of TRAVER can vary on separate switches.

## Flexible Bellcore AMA (continued)

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### TRAVER output example for Flexible Bellcore AMA without AMA pretranslation datafill

```
TRAVER L 6211234 9501488 B
TABLE LINEATTR
0 1FR NONE NT FR01 0 613 P621 L613 CTOP 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 STDPRTCT
P621 ( 1) ( 0)
.SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
.9501488 9501488 FGB DD 0 ITT Y OFRT 1002 7 7
..TABLE OFRT
..1002 N D OCAMDCM 0 N N
..EXIT TABLE OFRT
.SUBTABLE AMAPRT
.KEY NOT FOUND
.DEFAULT VALUE IS: NONE OVRNONE N

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 OCAMDCM 9501488 ST

TREATMENT ROUTES.TREATMENT IS: GNCT
1 OFLO

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

The datafill that translates a call appears in the TRAVER utility. The TRAVER utility supports AMA pretranslation.

When subtable AMAPRT contains the entries for the received leading digits of the called number, TRAVER displays subtable AMAPRT datafill. If subtable AMAPRT does not contain the entries for the received leading digits, the default datafill appears as NONE.

### Verifying 088 call code generation

You can use the following procedure to verify the generation of call code 088.

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**Flexible Bellcore AMA** (continued)

---

**Procedure to verify 088 call code generation*****At your location***

- 1 Make sure that an active file for AMA recording is present.
- 2 Set translations so that when 621-1235 dials 555-1234, a billing record does not generate. Make sure that table LINEATTR or table TRKGRP specifies a pretranslator that indexes to table STDPRTCT.
- 3 From 621-1235, dial 555-1234. Make sure that an AMA record does not generate.
- 4 Add the following tuple to subtable AMAPRT: 5551234 5551234 NONDA555 N.
- 5 From 621-1235, dial 555-1234. Answer the call.
- 6 Leave the call connected for a minimum of 5 s to make sure an answered AMA record generates.
- 7 Check that AMAB log generates with ccall cod 088.
- 8 Perform an AMADUMP of the AMA file that contains the call record. Make sure that an AMA record that produces call code 008 with structure code 00001 (answered) generates. Make sure that a SERV FEAT field value does not contain a value from 800 to 999.
- 9 Change the datafill of subtable AMAPRT to: 5551234 5551234 NONDA555 Y 800.
- 10 Repeat steps 5, 6, 7 and 8. Check that the same AMAB log and AMA record generate. Make sure that the SERV FEAT field in the AMA record contains a value of 800.

**Verifying 800 call code generation**

You can use the following procedure to verify the generation of call code 800.

**Procedure to verify 800 call code generation*****At four location***

- 1 Make sure that an active file for AMA recording is present.
- 2 Set translations so that when 621-1235 dials 622-1234, a billing record does not generate. Make sure that table LINEATTR or table TRKGRP specifies a pretranslator that indexes to table STDPRTCT.
- 3 From 621-1235, dial 622-1234. Make sure that an AMA record does not generate.
- 4 Add the following tuple to subtable AMAPRT: 622 622 GENERIC 800 N OVRLOCL N.
- 5 From 621-1235, dial 622-1234. Answer the call.
- 6 Leave the call connected for a minimum of 5 s to make sure an answered AMA record generates.
- 7 Check that an AMAB log generates with call code 800. If other call attributes apply, call code 800 may not generate.

## Flexible Bellcore AMA (end)

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- 8 Perform an AMADUMP of the AMA file that contains the call record. Make sure that an AMA record that produces call code 800 with structure code 00001 (answered) generates. Make sure that the SERV FEAT field value does not contain a value of 800 to 999.
- 9 Repeat step 5. Do not answer the call.
- 10 Check that an AMAB log generates with call code 800.
- 11 Perform an AMADUMP of the AMA file that contains the call record. Make sure that an AMA record that produces call code 800 with structure code 00002 (unanswered) generates. The SERV FEAT field value does not contain a value from 800 to 999.
- 12 Change the datafill in subtable AMAPRT to the following: 622 622  
GENERIC 800 N Y 999.
- 13 Repeat steps 5, 6, 7 and 8. Verify that the same AMAB log and AMA record generate. Make sure that the SERV FEAT field in the AMA record contains a value of 999.
- 14 Change the datafill in subtable AMAPRT to the following: 622 622  
GENERIC 800 Y Y 999.
- 15 Route a call so that other call attributes, like OUTWATS and equal access, apply.
- 16 Check that an AMAB log generates with call code 800.
- 17 Perform an AMADUMP of the AMA file that contains the call record. Make sure that an AMA record generates. The AMA record must produce call code 800. The structure code is the code that generates if AMA pretranslation is not activated. Verify that the SERV FEAT field value is 999.

## SERVORD

Flexible Bellcore AMA does not use SERVORD.

---

## LCM REX Controller Enhancement

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### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

DMSCCM04 and later versions

### Requirements

This document includes the datafill information for this functionality. Complete implementation can require requirement software or hardware.

### Description

The LCM REX Controller Enhancement feature eliminates conflicts once present in the system. This feature eliminates conflict between host XMS-based peripheral module (XPM) routine exercise (REX) tests and REX tests performed on subtending line concentrating modules (LCM). Before this feature, the DMS switch allowed the system to perform these two tests at the same time. This event resulted in LCM E1/E2 outages.

### Operation

This feature eliminates the conflict between the XPM and LCM REX tests. This feature migrates the LCM REX test from the LCM node audit process to the system REX (SREX) controller. This action eliminates the conflict. The SREX controller already coordinates the XPM REX test. After the LCM REX test registers with the SREX controller, the system notifies the controller that some tests are not compatible. The central side (C-side) XPM REX test and the peripheral side (P-side) LCM REX test are not compatible. The SREX controller makes sure that mutual exclusion of the two tests occurs. This feature provides comparison capabilities to the LCM REX test. This comparison can reduce the time to perform REX testing on the complete office.

The position of the LCM REX test under the control of the SREX controller standardizes the LCM REX test interface. This action standardizes the LCM REX test interface with other nodes like XPMs. This feature allows the use of a central control interface for the LCM REX test. The system can perform the LCM REX test under optimized use of system resources. Central control and scheduling under best resources are two of the primary advantages that the SREX controller provides.

## LCM REX Controller Enhancement (continued)

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The LCM REX Controller Enhancement feature provides the following functions:

- This feature removes the continuity and voltage (COV) test step, performed on the power converters and ringing generator, from the LCM REX test. This feature places the COV in a separate test. This test is the LCMCOV REX test.
- This feature moves the LCM REX test from the node audit process over to the SREX controller. The SREX controller coordinates the LCMCOV REX test.
- This feature introduces mutual exclusion between REX tests on the host XPM and subtending LCMs.
- The system allows concurrent execution of the LCM REX test on a maximum of four LCMs.
- The LCMs can perform the REX test at the same time as XPMs that are not hosts to the LCMs under test.

### Previous LCM REX test subsystem

This section describes the LCM REX test subsystem as it was before the LCM REX Controller Enhancement feature.

#### Scheduling

Before this feature, the LCM node audit process coordinated the LCM REX test subsystem. Office parameter LCDREX\_CONTROL in table OFCVAR determined the LCM REX test interval. The test interval is between the LCM start and stop times. The same parameter can enable or disable the LCM REX test globally.

The node audit process began to test the LCMs in the REX test interval one at a time. The node audit process performs the tests in the entry order of the LCMs. The node audit process often did not test the LCMs in one interval. In this event, tests continued in the next interval on the LCMs that the node audit process did not test. After the node audit process tested each LCM, the cycle repeated again with the first LCM. The node audit process did not test the LCMs twice during the same interval. The number of LCMs in the office determined the frequency of the LCM REX test. The time required for the node audit process to perform the REX test on one LCM was 8 min to 10 min.

#### Conflict between XPM REX test and LCM REX test

Before this feature, a conflict was present between the XPM REX test and the LCM REX test. The host XPM and the subtending LCMs performed the REX test at the same time. This action was possible because a central control interface for the two tests was not present.



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## LCM REX Controller Enhancement (continued)

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### LCM REX test steps

Before this feature, the LCM REX test included the following steps:

1. System busy (SysB) unit 0
2. Perform in-service (INSV) diagnostics on unit 1
3. Perform power converter and ringing generator COV tests on unit 1
4. Perform out-of-service (OOS) diagnostics on unit 0
5. Return to service (RTS) unit 0
6. SysB unit 1
7. Perform INSV diagnostics on unit 0
8. Perform power converter and ringing generator COV tests on unit 0
9. Perform OOS diagnostics on unit 1
10. RTS unit 1
11. Perform INSV tests on unit 0 (not in takeover mode)
12. Perform an emergency stand-alone (ESA) REX test on ESA-equipped remote line concentrating modules (RLCM). This action was not performed for manual REX tests.

### User interface for LCM REX test

Before this feature, the user entered the TST command at the command interpreter (CI) level to perform manual LCM REX tests. The TST command provided options to query status information. The TST command determined the result of the last REX test. The REX test could be enabled or disabled on any LCM with the use of the TST command. The LCM REX test generated PM181 logs to indicate the result (pass/fail status) of the test.

### New LCM REX test subsystem

This section discusses the areas that the LCM REX test subsystem differs from the previous subsystem. The LCM REX Controller Enhancement feature implements this subsystem.

The LCM REX Controller Enhancement feature separates the COV testing part of the original REX test in a separate LCMCOV REX test. This test is under control of the SREX controller. Separation of the two tests allows the system to perform the LCM REX test in parallel on more than one LCM. The LCM REX test has the same steps as before except for the COV test steps. The COV test steps moved to the separate LCMCOV REX test. The LCMCOV REX test contains COV tests on the power converter and ringing generator circuit packs of the LCM.

## LCM REX Controller Enhancement (continued)

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### Scheduling

The SREX controller schedules the LCM REX test and the LCMCOV REX test. The SREX controller uses office parameter NODEREXCONTROL in table OFCVAR. This parameter contains REX test start and stop times. This parameter also contains a field to enable or disable the SREX controller in the office globally.

*Note:* The LCM REX test does not use office parameter LCDREX\_CONTROL. Nodes like line modules (LM) continue to use this office parameter.

The SREX controller performs the REX test on different nodes in the system like the computing module (CM), message switch (MS), and XPMs. The SREX controller performs the REX test during the REX test interval each day. The SREX controller allows customization of the REX test schedule for different nodes through table REXSCHED. The operating company personnel can set different parameters like the following:

- days on which to disable a specified REX test
- the frequency of a REX test
- the number of REX tests of a type that the system can perform in parallel

### Interaction with XPM REX test

The SREX controller allows parallel execution of the LCM REX test on a maximum of four LCMs at a time. Parallel execution indicates the LCM REX test occurs on more than one LCM at a time. When four LCMs perform the REX test in parallel, the offices with large numbers of LCMs can complete REX testing. This test is complete in seven days. The number of LCMs that can perform the LCM REX test in parallel is one by default.

The SREX controller performs the LCMCOV REX test on one LCM at a time because of hardware limits. The LCM REX test and the LCMCOV REX test cannot perform on the same LCM at the same time.

The LCM REX test and the LCMCOV REX test are exclusive with the enhanced network (ENET) REX test and the MS REX test.

Mutual exclusion of the host XPM REX test and the LCM REX test is an important ability that the SREX controller provides. The controller allows LCMs to perform the REX test at the same time as XPMs that are not hosts to tested LCMs. This ability can reduce the total time to perform the REX test on the complete office system. The capacity to perform the REX test on four LCMs in parallel also helps in the decrease of test time. If you increase

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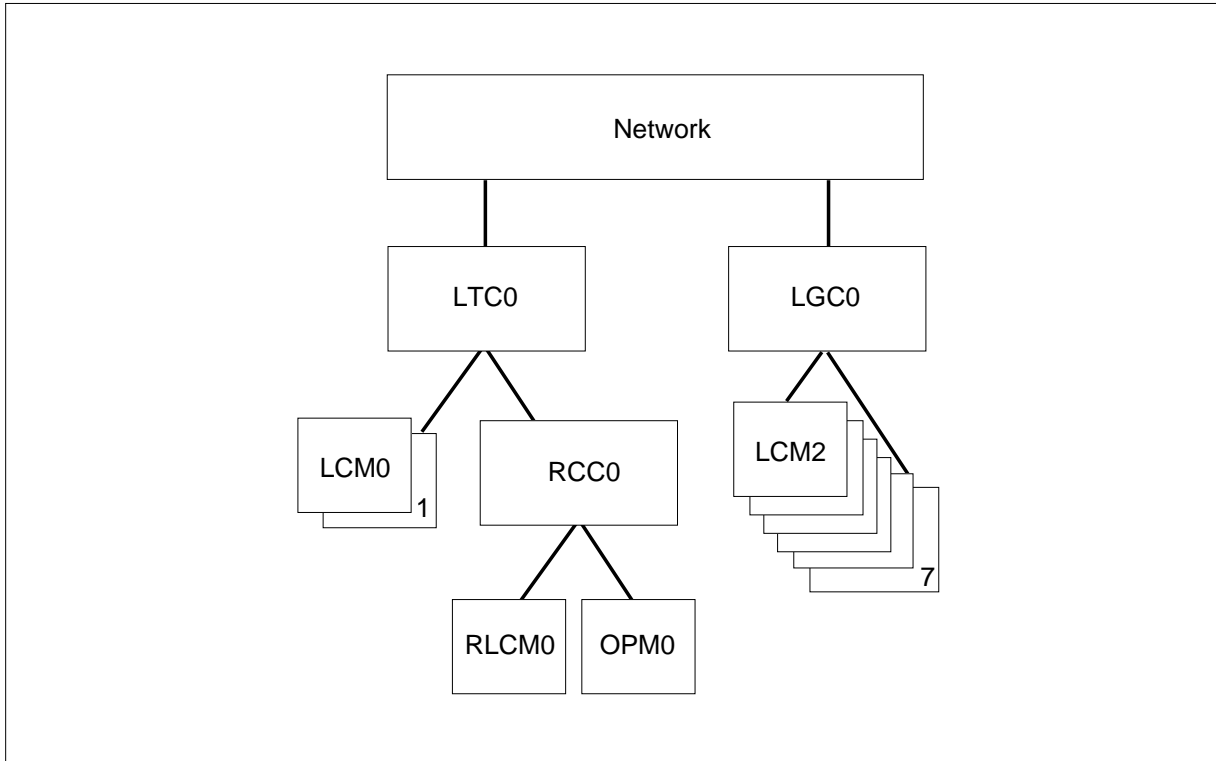
## LCM REX Controller Enhancement (continued)

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parallelism, the system can place more nodes in simplex mode at the same time. This action can increase the vulnerability of the system to faults.

An example setup for REX tests that occur at the same time in an office appears in the following figure.

### Example setup for concurrent REX tests in an office



Assume that the LCMs are set up to perform the REX test in parallel. Based on this example, the following are possible plans for nodes that perform the REX test:

- The XPM LTC0 and any four of the LCMs LCM2 through LCM7 can perform the REX test in parallel.
- The XPMs LGC0 and RCC0 and LCMs LCM0 and LCM1 can perform the REX test in parallel.

## **LCM REX Controller Enhancement** (continued)

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- The XPM LGC0 and LCMs LCM0, LCM1, RLCM0, and outside plant module (OPM) 0 can perform the REX test in parallel.
- The following can perform the REX test in parallel:
  - the XPM RCC0
  - LCM0 and LCM1
  - any two LCMs from LCM2 through LCM7

Mutual exclusion between REX tests performed on C-side XPMs and subtending LCMs extends to two levels of XPMs. For instance, assume the system performs the REX test on LTC0 but not on RCC0. When this event occurs the system cannot perform the REX test on the subtending LCMs RLCM0 and OPM0.

### **LCM REX test steps**

The LCM REX test the LCM REX Controller Enhancement feature implements includes the following steps:

1. SysB unit 0
2. Perform INSV diagnostics on unit 1
3. Perform OOS diagnostics on unit 0
4. RTS unit 0
5. SysB unit 1
6. Perform INSV diagnostics on unit 0
7. Perform OOS diagnostics on unit 1
8. RTS unit 1
9. Perform INSV tests on unit 0 (not in takeover mode)
10. Perform an ESA REX test on ESA-equipped RLCMs/OPMs (this is not done for manual REX tests)

Note that the steps for the power converter and ringing generator voltage tests are not present.

### **LCMCOV REX test steps**

The LCMCOV REX test checks specified voltages in the power converter packs. The LCMCOV REX test checks the ringing voltages that the ringing generator pack generates. The ringing voltage tests continuity of the supply voltage lines from the ringing generator to the line cards. The test utilizes line test unit (LTU) connections to measure the voltages at the tip and ring points

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## LCM REX Controller Enhancement (continued)

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of the maintenance line card. The maintenance line card is always line card 0 in drawer 0 of unit 0. Unit 1 uses this card when unit 0 is out of service.

The LCMCOV REX test places the LCM in simplex mode. Assume the system performs the LCM REX test and the LCMCOV REX test once each week on an LCM. The LCM REX test places the LCM in simplex mode three times during the week. This action occurs twice during the LCM REX test. This action occurs once during the LCMCOV REX test. Before this feature, the LCM REX test placed an LCM in simplex mode only twice a week. The gathered LCM simplex time for each week decreases by the performance of two separate tests. These tests are LCM REX and LCMCOV REX.

Only the following LCM types implement the LCMCOV REX test:

- LCM with 64 kbyte capacity
- LCM with 256 kbyte capacity/extended LCM (XLCM)
- OPM
- RLCM

The LCMCOV REX test includes the following steps:

1. SysB unit 0
2. Perform power converter and ringing generator COV tests on unit 1
3. RTS unit 0
4. Perform power converter and ringing generator COV tests on unit 0

### **User interface for LCM REX and LCMCOV REX tests**

The steps for the power converter and ringing generator voltage tests were removed. This feature adds the TST COVREX command at the MAP level. This feature provides TST COVREX command to support manual execution of the LCMCOV REX test. The TST REX command that is present supports manual execution of the LCM REX test. The user can perform these tests

## LCM REX Controller Enhancement (continued)

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manually at the MAP terminal. To perform this action, enter the following commands.

- Enter the following command to post the LCM:

```
>MAPCI;MTC;PM;POST LCM <site> <frame> <unit>
```

- Enter the following command to perform the LCM REX test on the posted LCM:

```
>TST REX NOW
```

- Enter the following command to perform the LCMCOV REX test on the posted LCM:

```
>TST COVREX NOW
```

### Logs

Log type PM600 reports LCM REX and LCMCOV REX test failures. The PM600 logs replace the PM181 logs the earlier LCM REX test used. The system generates a PM600 trouble log only when REX test failure occurs. The system generates a PM181 info log for LCMs that pass the REX test.

Log IOAU112, that the SREX controller uses, is modified to suit the LCM REX test. This log specifies the class of the REX test for which the system generates the log. The system requires this condition because two classes of REX tests are performed on the LCMs. These tests are the LCM REX test and the LCMCOV REX test.

### Office parameter LCDREX\_CONTROL

Before this feature, LMs and LCMs used office parameter LCDREX\_CONTROL in table OFCVAR. The LMs and LCMs used this parameter to coordinate the REX tests on these nodes. The LCMs do not use this office parameter. The SREX controller schedules the LCM REX test. The SREX controller uses office parameter NODEREXCONTROL in table OFCVAR.

### Table REXSCHED

This feature adds two tuples to table REXSCHED. These tuples are the LCM\_REX\_TEST and the LCMCOV\_REX\_TEST. Table REXSCHED allows the operating-company technician to customize the REX test scheduling in the office. This table lists every class of REX test that registers

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## LCM REX Controller Enhancement (continued)

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with the SREX controller. The technician can change different parameters in the tuple. These parameters can be the following:

- days on which to disable a specified REX test
- frequency of a REX test
- number of REX tests of a type that the system can perform in parallel

The maximum value for number of LCMs that can perform the LCM REX test in parallel is 4. The maximum value that corresponds for the LCMCOV REX test is 1. The frequency of these tests defaults to 7, once each week.

For more information, refer to How to enter data into table REXSCHED in this feature description.

### Translations table flow

The LCM REX Controller Enhancement does not affect translations table flow.

### Limits

The following limits apply to LCM REX Controller Enhancement:

- The LCM REX test modifications apply to every LCM type. The LCMCOV REX test occurs on the following LCM types only:
  - LCM with 64 kbyte capacity
  - LCM with 256 kbyte capacity/XLCM
  - OPM
  - RLCM
- The system does not perform the LCMCOV REX test on more than one LCM at a time.
- The system cannot perform the LCM REX test and the LCMCOV REX test on the same LCM at the same time.

### Interactions

The LCM REX Controller Enhancement does not have functionality interactions.

### Activation/deactivation by the end user

The LCM REX Controller Enhancement does not require activation or deactivation by the end user.

## LCM REX Controller Enhancement (continued)

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### Billing

The LCM REX Controller Enhancement does not affect billing.

### Station Message Detail Recording

The LCM REX Controller Enhancement does not affect Station Message Detail Recording.

### Datafilling office parameters

The office parameter that LCM REX Controller Enhancement uses appears in the following table. Refer to *Office Parameters Reference Manual* for more information about office parameters.

#### ATTENTION

Before the LCM REX Controller Enhancement feature, office parameter LCDREX\_CONTROL in table OFCVAR was used to coordinate REX testing on LCMs. With this feature, the office parameter NODEREXCONTROL in table OFCVAR coordinates the LCM REX tests. Nodes, like LMs, still use office parameter LCDREX\_CONTROL.



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## LCM REX Controller Enhancement (continued)

---

### Office parameters LCM REX Controller Enhancement

Table name	Parameter name	Explanation and action
OFCVAR	NODEREXCONTROL	<p>This parameter coordinates front-end and XPM REX testing. This parameter contains the following three fields:</p> <ul style="list-style-type: none"> <li>Field REXON specifies if the REX test scheduling mechanism is activated or deactivated. If field REXON is N, the REX test scheduling mechanism is deactivated for XPMs. The REX test scheduling mechanism continues for front-end testing. If field REXON is at the default value of Y, the XPM REX test scheduling mechanism is activated. Even if field REXON is N, the front-end REX tests run.</li> <li>Field REXSTART defines the time for the start of the REX test mechanism in hours (0 to 23) and minutes (0 to 59). The default value is 1 30 (1:30 a.m.).</li> <li>Field REXSTOP defines the time to stop the REX test mechanism in hours (0 to 23) and minutes (0 to 59). The default value is 3 30 (3:30 a.m.).</li> </ul>

### Datafill sequence

The tables that require datafill to implement LCM REX Controller Enhancement appear in the following table. The tables appear in the correct entry order.

### Datafill requirements for LCM REX Controller Enhancement

Table	Purpose of table
OFCVAR	Variable Office Parameter. This table contains data on variable office parameters for the office. See "Datafilling office parameters" in this feature description for more information.
REXSCHED	Route Exercise Schedule. This table contains the information that the SREX controller requires.

### Datafilling table REXSCHED

Datafill for LCM REX Controller Enhancement for table REXSCHED appears in the following table. The fields that apply directly to LCM REX

**LCM REX Controller Enhancement** (continued)

Controller Enhancement appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table REXSCHED (Sheet 1 of 3)**

Field	Subfield or refinement	Entry	Explanation and action
REXTSTID		see subfield	Routine exercise test. This field contains subfield REX_TEST_ID.
	REX_TEST_ID	LCM_REX_TEST, LCMCOV_REX_TEST	Routine exercise test identifier. The system automatically defines the REX test identifiers. The LCM REX Controller Enhancement feature adds tuples LCM_REX_TEST and LCMCOV_REX_TEST.
ENABLE		Y, N	<p>Enable. This field specifies if the REX test is enabled or disabled for a node type.</p> <p>This field is automatically set to Y (REX test enabled) for the LCM_REX_TEST and LCMCOV_REX_TEST tuples. To disable one of these two tests, set this field to N for the correct tuple.</p>
PERIOD		1 to 7	<p>Period. This field specifies the minimum number of days (from one to seven) between two following REX tests on the same node.</p> <p>Each REX test must run at once a week.</p> <p>This field is automatically set to 7 (REX test performed each week) for the LCM_REX_TEST and LCMCOV_REX_TEST tuples. To change the frequency of either test, set this field to a different value.</p>

---

**LCM REX Controller Enhancement** (continued)

---

Datafilling table REXSCHED (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
PARALLEL		1 to 4 (Note)	<p>Parallel. This field limits the number of REX tests that can occur in parallel for one node type. The SREX controller maximizes parallelism. The operating company can limit the number of parallel REX tests in a node type. This value is different for each REX test because the resources that each test requires determine the value.</p> <p>This field has a default value of 1 for the LCM_REX_TEST and the LCMCOV_REX_TEST tuples.</p> <p>For the LCM_REX_TEST tuple, this field can have a value from 1 to 4 (inclusive).</p> <p>For the LCMCOV_REX_TEST tuple, this field <i>must</i> be 1. The system does not perform the LCMCOV REX test on more than one LCM at a time.</p> <p><b>Note:</b> An error message results you attempt to set this field to a value greater than 4 for the LCM_REX_TEST tuple. An error message results if you attempt to set this field to a value other than 1 for the LCMCOV_REX_TEST tuple.</p>

**LCM REX Controller Enhancement** (continued)

Datafilling table REXSCHED (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
DAYSDSBL		MON, TUE, WED, THU, FRI, SAT, SUN, ALL, or NONE	<p>Days disabled list. This field specifies a list of days that a REX test does not run. The day refers to the scheduled start of the REX test. The system can have a REX test scheduled from Monday evening 23:00 to Tuesday morning 02:00. The system assumes the test started on Monday. The system assumes this even if the test runs at 01:00 Tuesday.</p> <p>Each REX test must run at once a week.</p> <p>Enter ALL to disable a REX test every day of the week. This entry can suspend very important tests for a limited time.</p> <p>This field is automatically set to NONE (REX test never disabled) for the LCM_REX_TEST and LCMCOV_REX_TEST tuples. To disable either test, set this field to a different value for the correct tuple.</p>

**Datafill example for table REXSCHED**

Sample datafill for table REXSCHED appears in the following example.

**MAP example for table REXSCHED**

REXTSTID	ENABLE	PERIOD	PARALLEL	DAYSDSBL
MS_REX_TEST	Y	1	1	NONE
CM_REX_TEST	Y	1	1	NONE
SLM_REX_TEST	Y	1	1	NONE
LIM_REX_TEST	Y	1	17	NONE
LGC_REX_TEST	Y	7	NA	NONE
MSB_REX_TEST	Y	1	10	NONE
LCMCOV_REX_TEST	Y	7	1	NONE
LCM_REX_TEST	Y	7	4	NONE

---

## LCM REX Controller Enhancement (end)

---

### Error messages for table REXSCHED

The following error messages apply to table REXSCHED.

#### Error messages for table REXSCHED

Error message	Explanation and action
The maximum for LCM_REX_TEST is 4 parallel REX test(s)	For the LCM_REX_TEST tuple, field PARALLEL can be a maximum value of greater than 4.
The maximum for LCMCOV_REX_TEST is 1 parallel REX test(s)	For the LCMCOV_REX_TEST tuple, field PARALLEL must be 1. This value applies because the system cannot perform the LCMCOV REX test on more than one LCM at a time.

### Tools for verifying translations

The LCM REX Controller Enhancement does not use tools for verifying translations.

### SERVORD

The LCM REX Controller Enhancement does not use SERVORD.

## Local Call Detail Recording

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

The release applicability is BCS34 and later versions.

### Requirements

The Local Call Detail Recording does not have requirements.

### Description

Descriptions of the Local Call Detail Recording feature appear in the following paragraphs.

#### **Local Call Detail Recording (BC0303)**

The Local Call Detail Recording (BC0303) feature facilitates charging of local calls. This feature bills an amount calculated from conversation time for every local call on lines assigned to this service. These calls are locally originated seven-digit extended area service (EAS) calls. Toll and local calls are recorded on the same tape. This feature handles toll calls in the normal method with the automatic message accounting (AMA) system. Feature BC0303 requires the NTX042AA LAMA package to function correctly.

Feature BC0303 serves as a LAMA extension in class five operation. This service is available for each individual line. This service is present with the following:

- flat rate
- message rate
- integrated business network
- coin
- OUTWATS
- private branch exchange (PBX)
- proprietary business set
- two-way WATS

#### **Compatibility of Lcdr Option on CDF and CCF Coin Lines (BR0758)**

This feature makes the Local Call Detail Recording (Lcdr) option compatible with coin, coin first (CCF), and coin, dial tone first (CDF) lines.

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## Local Call Detail Recording (continued)

---

The system generates the AMA data on Local and EAS calls from coin stations in Bellcore (BCFMT). Feature BR0758 requires feature BC0303 to function correctly.

### Operation

Line table control checks to make sure that the LCDR feature has been purchased. The LAMA determines if the call is an LCDR call. If the office has Bellcore AMA format (BCFMT), the system generates the call record format associated with the type of originating line.

Call types marked as LCDR provide a detailed record on AMA tape of answered and unanswered non-toll calls. An LCDR record generated in BCFMT provides the same information as a normal AMA record for the type of originating line.

At this time, the system can record AMA data for each coin line if the parameter COIN is in table AMAOPTS. Feature BR0758 allows the system to record individual coin line AMA data. These individual coin lines are CCF and CDF lines assigned the LCDR option. This assignment uses the Service Order (SERVORD) facility to add LCDR to a specified CCF or CDF line. Feature BR0758 is called the Compatibility of LCDR Option on CDF and CCF Coin Lines feature. Refer to *Bellcore Format Automatic Message Accounting Reference Guide*, 297-1001-830 for detailed information on AMA data recorded.

### Translations table flow

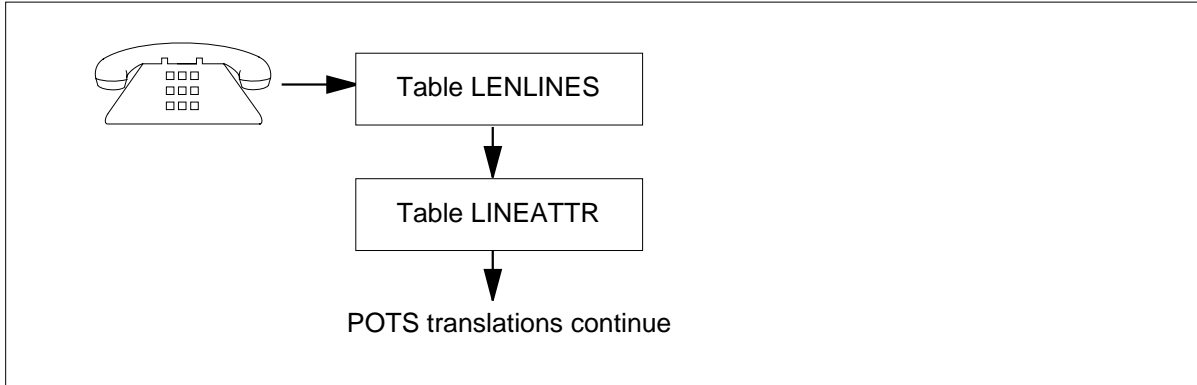
The Local Call Detail Recording translations tables appear in the following list:

- Table LENLINES contains the hardware assignments of every working line and any options assigned to the line.
- Table LINEATTR determines the indexing in screening tables and initially defines the type of line that generates the call.

The Local Call Detail Recording translation process appears in the following flowchart.

## Local Call Detail Recording (continued)

### Table flow for Local Call Detail Recording



The datafill content used in the flowchart appears in the following table.

### Datafill example for Local Call Detail Recording

Item	Example data
Calling number	(613) 644-5730
Called number	644-4560

### Datafill example for Local Call Detail Recording

Datafill table	Example data
LENLINES	HOST LM 0 0 00 27 S 0 6211234 DT 0 (LCDR CLI) \$
LINEATTR	0 1FR NONE NT FR01 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 0 NIL NIL 00 N \$

## Limits

The following limits apply to Local Call Detail Recording:

- Features BC0303 and BR0758 are not compatible with every line class code or option.
- Refer to *SERVORD Reference Manual* for line class codes and options compatibility table LCCOPT and table OPTOPT.

## Interactions

The Local Call Detail Recording does not have functionality interactions.



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## Local Call Detail Recording (continued)

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### Activation/deactivation by the end user

The following section describes how to activate and verify that features BC0303 and BR0758 function correctly.

#### Activation sequence

Activation occurs when LCDR is enabled and the LCDR option is added to a line. Restart is not needed.

#### Verification sequence

The following procedure can verify that features BC0303 and BR0758 function for Bellcore AMA format (BCFMT).

#### Procedure for verifying features BC0303 and BR0758

Perform the following steps.

##### *At the MAP (maintenance and administrative position) display:*

- 1 In table AMAOPTS, set LOGAMA to ON.
- 2 Make sure an active AMA file for AMA recording is present.
- 3 Use the SERVORD command ADO to add LCDR to a CCF, CDF, or 1FR line that is present.
- 4 From a CCF (6211001), CDF (6211002), or a 1FR (6211234) line, dial a local seven-digit number (6211235).
- 5 Answer the terminating DN, and go on-hook with the sets.
- 6 Enter Open AMAB at the MAP. Make sure that the system records call code 041 (coin) for the coin lines. Make sure that the system records 067 for the 1FR line.
- 7 During low traffic periods, operating company personnel can make a test call to verify features. To make sure information records correctly, enter the following command sequence:

```
>AMADUMP BC CALLDUMP
>AMADUMP
>CALLDUMP
>RECORD START ONTO prt_name
Perform test call now.
>CALLDUMP
>RECORD STOP ONTO prt_name
```

**Note:** This command sequence must be used only during low-traffic periods. If the period is not a low-traffic period, use the DIRCOPY command to copy data to a test file. Use the AMADUMP command to dump data to a printer or terminal.

Local Call Detail Recording does not require activation or deactivation by the end user.

## Local Call Detail Recording (continued)

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### Billing

The AMA records generate for every originating line with the LCDR option. The type of line to which the LCDR option is added determines the call code the system generates for the BCFMT.

The system can generate the Bellcore AMA format-041 (local coin call code) record. The system generates this record when a user makes a call from CCF or CDF type coin lines with LCDR.

The following figures are examples of flat rate (1FR) and coin, CCF records the system generates with the AMADUMP facility with BCFMT. A hexadecimal C is at the end of each field in BCFMT. The C indicates the field is complete.

#### Example of Bellcore AMA record for 1FR call

```
HEX ID:AA STRUCT CODE:00001C CALL TYPE: 067C SENSOR TYPE:036C
SENSOR ID:0000000C REC OFC TYPE:036C REC OFC ID: 0000000C
DATE:60327C TIMING IND: 00000C STUDY IND:0220000C ANSWER: 0C
SERV OBSERVED:0C OPER ACTION:0C SERV FEAT:000C ORIG NPA:613C
ORIG NO:6211234C OVERSEAS IND:1C TERM NPA:00613C
TERM NO:6211235C CONN TIME:0134519C ELAPSED TIME: 000000054C
```

#### Example of Bellcore AMA record for CCF call

```
HEX ID:AA STRUCT CODE:00001C CALL TYPE: 041C SENSOR TYPE:036C
SENSOR ID:0000000C REC OFC TYPE:036C REC OFC ID: 0000000C
DATE:60327C TIMING IND:00000C STUDY IND:0220000C ANSWER:0C
SERV OBSERVED:0C OPER ACTION:0C SERV FEAT:001C ORIG NPA:613C
ORIG NO:6211001C OVERSEAS IND:1C TERM NPA:00613C
TERM NO:6211235C CONN TIME:0138274C ELAPSED TIME: 000000082C
```

Refer to *Bellcore Format Automatic Message Accounting Reference Guide*, 297-1001-830 for detailed information that describes AMA records in Bellcore AMA formats.

### Station Message Detail Recording

Local Call Detail Recording does not affect Station Message Detail Recording.

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## Local Call Detail Recording (continued)

---

### Datafilling office parameters

The office parameters Local Call Detail Recording uses appear in the following table. Refer to *Office Parameters Reference Manual* for additional information about office parameters.

#### Office parameters Local Call Detail Recording

Table name	Parameter name	Explanation and action
OFCENG	LCDR_SEC_ANI_TEST	You can use this parameter if you add the LCDR option to two-party or four-party lines. The system always performs the automatic number identification test on toll calls. This office parameter performs a second ANI test on local calls.

### Datafill sequence

The tables that require datafill to implement Local Call Detail Recording appear in the following table. The tables appear in the correct entry order.

#### Datafill tables required for Local Call Detail Recording

Table	Purpose of table
LINEATTR	Line Attribute Table. This table assigns line attributes to Meridian Digital Centrex (MDC) stations and attendant consoles.
LENLINES	Line Assignment Table. This table contains the following for each entered line: <ul style="list-style-type: none"> <li>• the site name assigned to the remote location if the line is remote</li> <li>• the LEN</li> <li>• the party which has the DN</li> <li>• the DN</li> <li>• the signal type</li> <li>• the index in table LINEATTR</li> <li>• options assigned to the line</li> </ul> <p><b>Note:</b> Use SERVORD to enter data into this table. A datafill procedure or example is not provided. Refer to the SERVORD section in this document for examples of how to use SERVORD to enter data into this table.</p>

### Datafilling table LINEATTR

Datafill for Local Call Detail Recording for table LINEATTR appears in the following table. The fields that apply to Local Call Detail Recording appear in

## Local Call Detail Recording (continued)

the table. See the data schema section of this document for a description of other fields.

### Datafilling table LINEATTR

Field	Subfield or refinement	Entry	Explanation and action
LCC		alphanumeric	Line class code. Enter the line class code assigned to the line attribute index. The LCC of a tuple that is present cannot change.

### Datafill example for table LINEATTR

Sample datafill for table LINEATTR appears in the following example.

### MAP example for table LINEATTR

```

Table: LINEATTR
LAIIDX  LCC  CHGCLSS  COST  SCRNCN  LTG  STS  PRTNM  LCANAME
ZEROMPOS          TRAFSNO
MRSA  SFC          LATANM  MDI  IXNAME  DGCLNAME  FANIDIGS
RESINF          OPTIONS
-----
0      1FR      NONE      NT      FR01      0      613      P621      L613
TSPS          10
  NIL  NILSFC  LATA1      0      NIL          NIL          00
  N          $
4      CCF      NONE      LO      FR01      0      613      P621      L613
TSPS          10
  NIL  NILSFC  LATA1      0      NIL          NIL          00
  N          $
6      CDF      NONE      NT      FR01      0      613      HTOP      L613
TSPS          10
  NIL  NILSFC  LATA1      0      NIL          NIL          00
  N          $
    
```

For BCS34 and later versions, fields LCABILL and HOT are removed in table LINEATTR. Fields LCABILL and HOT are placed as options in the options field.

## Tools for verifying translations

Local Call Detail Recording does not use tools for verifying translations.

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## Local Call Detail Recording (continued)

---

### SERVORD

The SERVORD subsystem adds the LCDR option to a line. The ADO (add an option) command adds options to current lines. The NEW command assigns new lines and adds the options assigned to the new line. The SERVORD checks the compatibility of options to lines using table LCCOPT. The SERVORD checks the compatibility of options to options using table OPTOPT. Refer to the *SERVORD Reference Manual* for details about the service order subsystem.

Feature BR0758 modified table LCCOPT to include LCDR as a line class code compatible with CCF and CDF coin lines. The SERVORD accepts LCDR as a correct option compatible with CCF and CDF lines.

Complete the datafill for the required table LENLINES with SERVORD. Table LENLINES (line assignment table) contains the following:

- the site name for each entered line assigned to the remote location (if the line is remote)
- the LEN
- the party which has the DN
- the DN
- the signal type
- the index in table LINEATTR
- the options assigned to the line

### SERVORD limits

The Local Call Detail Recording does not have SERVORD limits.

### SERVORD prompts

The SERVORD prompts used to assign Local Call Detail Recording to CCF and CDF lines appear in the following table.

#### SERVORD prompts for Local Call Detail Recording

Prompt	Correct input	Explanation
DN_OR_LEN	Correct DN or LEN	Enter the seven-digit DN or enter the LEN.
OPTION	LCDR	Enter LCDR to assign Local Call Detail Recording to CCF and CDF lines.

## Local Call Detail Recording (continued)

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### **SERVORD example for how to add Local Call Detail Recording**

How to add Local Call Detail Recording to current CCF lines with the ADO command appears in the following SERVORD example.

*Note:* This datafill does not apply to every condition. Use this datafill only to understand the flow of call order.

### **SERVORD example for adding Local Call Detail Recording to current CCF lines with the ADO command in prompt mode**

```
>SERVORD
SO:
>ADO
SONUMBER: NOW 91 8 4 AM
>$
DN_OR_LEN:
>6211001
OPTION:
>LCDR
OPTION:
>$
COMMAND AS ENTERED:
ADO NOW 91 8 4 AM 6211001 (LCDR) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
```

### **SERVORD example for adding Local Call Detail Recording to current CCF lines with the ADO command in no-prompt mode**

```
>ADO $ 6211001 Lcdr $ Y
```

The addition of Local Call Detail Recording to current CDF lines with the ADO command appears in the following SERVORD example.

---

**Local Call Detail Recording (end)**

---

**SERVORD example for adding Local Call Detail Recording to current CDF lines with the ADO command in prompt mode**

```
>SERVORD
SO:
>ADO
SONUMBER: NOW 91 8 4 AM
>$
DN_OR_LEN:
>6211002
OPTION:
>LCDR
OPTION:
>$
COMMAND AS ENTERED:
ADO NOW 91 8 4 AM 6211002 (LCDR) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
```

**SERVORD example for adding Local Call Detail Recording to current CDF lines with the ado command in no-prompt mode**

```
>ADO $ 6211002 LCDR $ Y
```

After the LCDR option is added to a line, the query directory number (QDN) command reflects the change.

Refer to the *SERVORD Reference Manual* for a detailed description of the QDN command using SERVORD.

## Messaging Services Functional Component Re-engineer

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: BAS00003

### Release applicability

NA013 and up

### Requirements

To operate the Messaging Services Functional Component Re-engineer feature requires the BAS00003 functional group and BAS00003 functionality ordering code.

### Description

The Messaging Services Functional Component (FC) includes the present functionalities or services that follow:

- DMS-100 switch to remote system link for 1X67, HS1X67, and 1X89 multiprotocol controller card (MPC)
- DMS-100 switch to remote system link for SMDIDATA, SMDRRPT, ACDRPT, and MGTRPT software
- simplified message desk interface (SMDI) software that supports Bellcore TR-TSY-00283
- station message detail recording (SMDR) reporting software
- many different types of message waiting indication (MWT) software
- executive message waiting (EMW) software
- network message system (NMS) software for network MWT and network EMW
- call retrieval software (CRR or CAR)
- class message waiting indication (CMWI) software

The development of the FC software occurred approximately in Batch Change Supplement (BCS) 23. The expansion of the FC software with many different features continued for more than next ten years. The software did not include generic functionality and interactions with other features. The FC software does not have a clear architectural design for future support, expansion, and generic service for other features.



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## Messaging Services Functional Component Re-engineer (continued)

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The problems with the FC software requires re-engineering to reduce service requests (SRs) and provide manageable software. The FC re-engineering provides a service without major change.

The Messaging Services Functional Component Re-engineer feature adds the functionalities and improvements that follow:

- development of IOM support for SLLNKDEV
- robustness improvements in table SLLNKDEV (Link Device Table) for datafill, warnings, and alarms
- real time improvement for Auxiliary Call Processing (AUXCP) usage. The real time improvement includes reduction of the SMDI link AUXCP allocation. The present AUXCP allocation is six percent.
- expansion of SMDI to support 999 message desks to meet Bellcore requirements. SMDI supports 63 message desks before this feature.
- conversion of software from North American (NA) directory number (DN) system format to E.164-Universal DN system format
- improvement in the usage of feature queue software resources (FTRQs) for MWT or EMW and removal of switch activity (SWACT) problems
- addition of the Message Waiting Lamp (MWL) display as the MWT indicator for the EMW option on a MBS when operating company personnel use the QLEN command
- changes the key list check for EMW to occur at the Service Order System (SERVORD) level. The key list check is now done in table write procedures in the EMW software.

### Operation

The sections that follow describe the functionalities and architectural improvement in detail for the Messaging Services Functional Component Re-engineer feature.

#### IOM Support for SLLNKDEV Link

The design of the Input Output Multiprotocol Controller (IOM) is an alternative for the 1X89 Input or Output Controller (IOC) board. The entry for the IOM board is in table SLLNKDEV as 1X89. The IOM board uses MPC software for the 1X89 to support SMDI. The Messaging Services Functional Component Re-engineer feature adds FX30 product engineering code (PEC) in table SLLNKDEV to represent the correct PEC. The FX30 PEC also helps in troubleshooting the SMDI link. The existing provisioning and functionality of the 1X89 MPC does not change.

## **Messaging Services Functional Component Re-engineer** (continued)

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### **Improvements in table SLLNKDEV links**

To add, change, or delete a link in table SLLNKDEV requires an exact sequence. The datafill does not provide appropriate alarms, warnings, or logs if the exact sequence is not followed. The Messaging Services Functional Component Re-engineer feature improves the robustness of the table SLLNKDEV links and datafill.

The alarms occur in the following cases with the Messaging Services Functional Component Re-engineer feature:

- The alarm SLLNKERR occurs if the datalink fails or the datalink does not come up. The operating company personnel determine the datalink from the appropriate SLNK logs (SLNK103 log or SLNK107 log). The operating company personnel must busy and return to service the datalink at the maintenance and administration position (MAP). The busy (BSY) or return to service (RTS) commands at the MAP does not generate the alarm.
- The alarm SMDIERROR occurs when the outgoing SMDI process or the incoming SMDI process fails because of software problems. The forced kill of the process does not generate the alarm.
- The alarm SLLNKERR occurs when the outgoing SMDI process or the incoming SMDI process fails because of hardware problems. The operating company personnel must busy and return to service the datalink. The forced kill of the process does not generate the alarm.
- The alarm SMDIERROR occurs if the outgoing SMDI process or the incoming SMDI process uses more than the maximum 6% of the AUXCP usage.

### **Expansion of 999 message desks in SMDI software**

The Messaging Services Functional Component Re-engineer feature expands the number of message desks support from 63 to 999 message desks. The change affects table SLLNKDEV and table UCDGRP (Uniform Call Distribution Group). The result of this change is the operating company personnel can provision a maximum of 999 message desks.

### **Conversion of software to E.164 Universal DN system format**

The current DMS-100 software supports the fixed 3-3-4 North American DN system format. The International Telecommunications Union (ITU) requires variable length DNs. The Messaging Services Functional Component Re-engineer feature improves the DMS-100 software to support variable lengths of area code, office code, and station code up to ten digits. The conversion of the software to the E.164 Universal DN system format allows variable length DNs for the international market.

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**Messaging Services Functional Component Re-engineer** (continued)

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**EMW keylist change**

Before this feature, the error message for an invalid DNLIST displayed when operating company personnel entered the first “Y” with addition of option EMW through SERVORD. The enhancement with the Messaging Services Functional Component Re-engineer feature allows the error message to display when operating company personnel enters an invalid value for the DNLIST prompt.

**MWL as MWT indicator for a MBS with the EMW option**

The Message Services Functional Component Re-engineer feature adds the MWL display as the MWT indicator for a MBS with the EMW option. The MWL displays when operating company personnel use the QLEN command for a MBS with the EMW option. This enhancement allows the correct information to display for the EMW option.

**Translations table flow**

The list that follows includes the Messaging Services Functional Component Re-engineer feature translations tables:

- Table SLLNKDEV
- Table UCDGRP

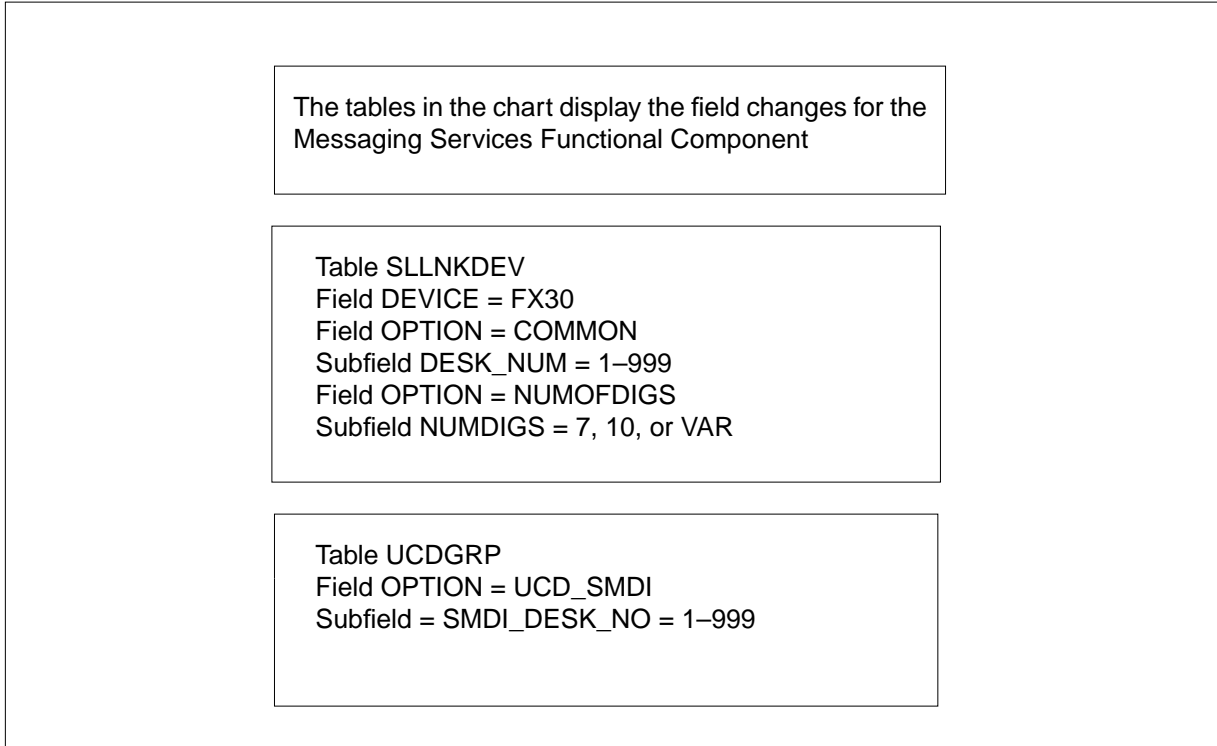
*Note 1:* The Messaging Services Functional Component Re-engineer feature removes the requirement for an entry for Network Message Waiting Service (NMS MWT) in table TCAPTRID.

*Note 2:* Table TCAPTRID is obsolete. See Data Schema Reference Manual for details.

The flowchart that follows provides the Messaging Services Functional Component Re-engineer feature translations process.

## Messaging Services Functional Component Re-engineer (continued)

Table flow for Messaging Services Functional Component Re-engineer



The table that follows lists the datafill content used in the flowchart.

Datafill example for Messaging Services Functional Component Re-engineer

Datafill table	Example data
SLLNKDEV	SMDI2 FX30 0 3 NONE NONE INOUTLK (SMDIDATA (COMMON 999 ALL) \$) \$ SMDI1 1X89 1 2 NONE NONE INOUTLK (SMDIDATA (NUMOFDIGS VAR) \$) \$
UCDGRP	SMDI0 N MDC15 OFRT 6 OFRT 6 0 5 N 0 0 15 5 (UCD_SMDI SMDI0 999 \$) \$

### Limitations and restrictions

The limitations and restrictions that follow apply to the Messaging Services Functional Component Re-engineer feature:

- The entry in the DMS-100 switch must use two-digit message desk numbers if the voice mail system can only support two-digit message desk numbers. The DMS-100 switch does not check for assignment of message desk numbers in the voice mail system.
- The DMS-100 switch does not convert three-digit message desk numbers. The DMS-100 switch sends three-digit message desk numbers to the voice

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## Messaging Services Functional Component Re-engineer (continued)

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mail system. SMDI requires a zero to prefix two-digit message desk numbers.

### Interactions

The Messaging Services Functional Component Re-engineer feature supports existing interactions with other functionalities.

### Activation and deactivation by the user

The Messaging Services Functional Component Re-engineer feature does not require activation or deactivation by the user.

### Billing

The Messaging Services Functional Component Re-engineer feature does not generate billing records or changes.

### Station Message Detail Recording

Messaging Services Functional Component Re-engineer does not require Station Message Detail Recording.

### Office parameters used by Messaging Services Functional Component Re-engineer

The Messaging Services Functional Component Re-engineer feature does not generate new office parameters.

### Datafill sequence

The table that follows lists the tables that require datafill to put the Messaging Services Functional Component Re-engineer feature into operation. You must enter data into the tables in this order.

#### Datafill requirements for Messaging Services Functional Component Re-engineer

Table	Purpose of table
SLLNKDEV	Link Device Table contains the entries for the devices to transfer data to or from the DMS-100 switch.
UCDGRP	Uniform call distribution group contains the attributes for each UCD group. The attributes include the queue parameters and the options for each UCD group.

### Datafill related to Messaging Services Functional Component Re-engineer for table SLLNKDEV

The table that follows provides the datafill related to the Messaging Services Functional Component Re-engineer feature for table SLLNKDEV. This table

**Messaging Services Functional Component Re-engineer** (continued)

includes only those fields that apply directly to the Messaging Services Functional Component Re-engineer feature.

**Datafill related to table SLLNKDEV (Sheet 1 of 2)**

Field	Subfield	Entry	Explanation and action
DEVTYPE		see subfield	Device type. This field consists of subfield DEVICE. Enter the device type 1X67,1X89, HS1X67, or FX30. The device type FX30 is the PEC for IOM.
	DEVICE	1X67, 1X89, HS1X67, FX30	Device. Enter the device type 1X67, 1X89, HS1X67, or FX30. The device type FX30 is the PEC for IOM.The device type 1X89 and FX30 requires the entries in the MPCNO subfield and the LINKNO subfield.
	MPCNO	0 to 255	Multiprotocol controller number. Enter the number of the 1X89 card or the FX30 card.
	LINKNO	0 to 3	Multiprotocol controller link. Enter the 1X89 or the FX30 card link number. The 1X89 device type can use the link 2 or link 3 as the LINKNO. The FX30 device type uses link 3 as the LINKNO.
XFERS		see subfield	Transfers. The XFERS field consists of the XFER subfield.
	XFER	ACDRTD, MGTRPT, SMDIDATA, SMDRRPT, or XSMDATA	Transfer. Enter the report types on this datalink. For the Messaging Services Functional Component Re-engineer feature, the report type is SMDIDATA. Enter the transfer type of SMDIDATA and the SMDI_OPTS subfield.
	SMDI_OPTS	see subfields	Station message desk interface options. The SMDI_OPTS subfield consists of the OPTION subfield.
	OPTION	DNSUPPR, LASTFWDN, NONMS, NMSPTV, NUMOFDIGS, SPLITNNX, COMMON, HEARTBEAT, or CGNADDRDN	Option. For the Messaging Services Functional Component Re-engineer enter the NUMOFDIGS option and the NUMDIGS subfield. Also enter the COMMON option and the DESK_NUM and CRRTYPE subfields.

**Messaging Services Functional Component Re-engineer** (continued)

Datafill related to table SLLNKDEV (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	NUMDIGS	7, 10, or VAR	Number digits. Enter the digit format for the number of digits seven, ten, or variable when the OPTION subfield is NUMOFDIGS.
	DESK_NUM	1 to 999	Desk number. Enter the SMDI desk number 1 to 999 when the OPTION subfield is COMMON.
	CRRTYPE	ALL or NETWORK	Call request retrieval type. Enter the type of CRR that uses the common message desk number when the OPTION subfield is COMMON. Enter ALL if all link users (host and remote) are to use the common message desk for CRR. Enter NETWORK if subscribers outside of the host node are to use the common message desk for CRR. The CRRTYPE subfield did not change with the Messaging Services Functional Component Re-engineer feature.

**Datafill example for table SLLNKDEV**

The figure that follows shows sample datafill for table SLLNKDEV.

**MAP example for table SLLNKDEV**

DEVNAME	DEVTYPE	XLATION	PROTOCOL	DIRECTION XFERS
SMDI2 (SMDIDATA (COMMON 999 ALL)\$) \$	FX30 0 3	NONE	NONE	INOUTLK
SMDI1 (SMDIDATA (NUMOFDIGS VAR) \$) \$	1X89 1 2	NONE	NONE	INOUTLK

**Datafill related to Messaging Services Functional Component Re-engineer for table UCDGRP**

The table that follows provides the datafill related to the Messaging Services Functional Component Re-engineer feature for table UCDGRP. This table

## Messaging Services Functional Component Re-engineer (continued)

includes only those fields that apply directly to the Messaging Services Functional Component Re-engineer feature.

### Datafill related to table UCDGRP

Field	Subfield	Entry	Explanation and action
OPTION		UCD_SMDI	Option. Enter option UCD_SMDI and the subfields SMDILINK, SMDIDESKNO, and MCOSLIST.
	SMDILINK	alphanumeric	Terminal designation. Enter the terminal designation that is in field TERMDES in table TERMDEV.
	SMDIDESKNO	1 to 999	SMDI desk number. Enter the message desk number.  <b>Note:</b> If no agents are assigned to the UCD group, entering the maximum value of 999 blocks the retrieval of voice mail messages.
	MCOSLIST	CLASSA to CLASSP (vector of up to 4 entries) or \$	Message class of service list. Enter up to four message class of service (MCOS) entries from which the UCD group can receive messages. If fewer than four MCOS entries, enter \$ to terminate the vector.

### Datafill example for table UCDGRP

The figure that follows shows sample datafill for table UCDGRP.

### MAP example for table UCDGRP

UCDNAME	ACD	CUSTGRP	UCDRNGTH	THROUTE
NSROUTE	PRIOPRO	MAXPOS	DBG	DEFPRIO
RLSCNT	MAXWAIT	MAXCQSIZ	OPTIONS	
-----				
SMDI0	N	MDC	15	OFRT 6
OFRT 6	0	5	N	1 15 30 10
(UCD_SMDI	SMDI0	999\$)	\$	

### Translation verification tools

The Messaging Services Functional Component Re-engineer feature does not use translation verification tools.



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**Messaging Services Functional Component Re-engineer** (continued)

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**SERVORD**

The Messaging Services Functional Component Re-engineer feature does not add new commands or features to the Service Order System (SERVORD). The Messaging Services Functional Component Re-engineer feature allows an error message in SERVORD when the operating company personnel enter an invalid directory number list (DNLIST) for the addition of option EMW.

**SERVORD limitations and restrictions**

The Messaging Services Functional Component Re-engineer feature has no SERVORD limitations or restrictions.

**SERVORD prompts**

The table that follows provides the SERVORD prompts used to add EMW with Messaging Services Functional Component Re-engineer. Messaging Services Functional Component Re-engineer does not change the SERVORD prompts for EMW.

**SERVORD prompts for Messaging Services Functional Component Re-engineer**

Prompt	Correct input	Explanation
OPTKEY	1-69	Option key. The key on the business set for the assignment of the option.
OPTION	EMW	Executive Message Waiting
MCOS	CLASSP	Message waiting class of service. The MCOS the user subscribes to. Enter CLASSP for EMW.
DNLIST	1-69	Directory number list. A DN key which subscribes to an MCOS. The valid entries are 1 to 69. Specify one key for each for each MCOS.

**SERVORD example to assign EMW with Messaging Services Functional Component Re-engineer**

The SERVORD example that follows shows option EMW with the Messaging Services Functional Component Re-engineer feature. The SERVORD example uses the NEW command in prompt mode. The error message displays when the operating company personnel enters an invalid value for DNLIST. The error message displays before the validation is complete by SERVORD.

---

## Messaging Services Functional Component Re-engineer (continued)

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### SERVORD example for EMW with Messaging Services Functional Component Re-engineer in prompt mode

```
>NEW
SONUMBER: NOW 99 9 7 22 AM
> $
DN:
> 2466000
LCC_ACC:
> M5112
GROUP:
> BNR
SUBGRP:
> 0
NCOS:
> 0
SNPA
> 919
RINGING:
> Y
LATANAME:
> LATA1
LTG:0
> $
LEN_OR_LTID:
>0 1 0 5
OPTKEY:
> 5
OPTION:
> EMW
MCOS:
> CLASSP
DNLIST:
> 3
***ERROR***
EMW OPTION DNLIST HAS ONE OR MORE INVALID KEYS
DNLIST:
> 2
MCOS
> $
OPTKEY
> $
COMMAND AS ENTERED:
NEW NOW 99 9 7 22 AM 2466000 M5112 BNR 0 0 919 2 Y LATA1
0 HOST 00 1 00 05 (5 EMW CLASSP (2) $ $
```

---

## Messaging Services Functional Component Re-engineer (end)

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### SERVORD example for EMW with Messaging Services Functional Component Re-engineer in prompt mode (Continued)

```

ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y
MACHINES ARE OUT OF SYNC, SERVICE ORDERS NOT ALLOWED
JOURNAL FILE IS INACTIVE, SERVICE ORDERS NOT ALLOWED
SHOULD ORDER BE DONE ANYWAY? (Y OR N)
> Y

```

The SERVORD example that follows shows how to add EMW with Messaging Services Functional Component Re-engineer to a key with the NEW command in no-prompt mode. The error message displays before the validation is complete by SERVORD.

### SERVORD example for Messaging Services Functional Component Re-engineer in no-prompt mode

```

> NEW $ 2460000 M5112 BNR 0 0 919 2 Y LATA1 0 HOST 00 1 00 05 5
EMW CLASSP 3 $ $ Y Y
COMMAND AS ENTERED:NEW NOW 99 9 7 22 AM 2460000 M5112 BNR
0 0 919 2 Y LATA1 0 HOST 00 1 00 05 (5 EMW (CLASSP (3) $)
EMW OPTION DNLIST HAS ONE OR MORE INVALID KEYS
EMW did not pass checking.
***ERROR INCONSISTENT DATA***
COMMAND AS ENTERED:
NEW NOW 99 9 7 22 AM 2460000 M5112 BNR 0 0 919 2 Y LATA1 0
00 1 00 05 (5 EMW (CLASSP (3)) $)$
EMW OPTION DNLIST HAS ONE OR MORE INVALID KEYS
EMW did not pass checking.
***ERROR INCONSISTENT DATA***
COMMAND AS ENTERED:
NEW NOW 99 9 7 22 AM 2460000 M5112 BNR 0 0 919 2 Y LATA1 0
00 1 00 05 (5 EMW (CLASSP (2) $ ) $
ENTER Y TO CONFIRM, N TO REJECT or E to EDIT

```

## Network Management

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### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS29 and later versions

### Requirements

Network Management does not have requirements.

### Description

Network Management allows you to supervise and control network traffic, prevent traffic congestion, and use network management controls.

#### Features

A summary of the features appears in the following paragraphs.

#### **AF0582 - Prefix Code Controls**

Feature AF0582 modifies the method to use to apply code controls on prefix (PFX) codes. PFX codes are the digits that you use to access a network that is not the primary access carrier. You can apply a preroute peg (PRP) and a code block (CBK), or hard-to-reach flag (HTRF) against the same prefix code. Before this feature, you were not allowed to apply a CBK or HTRF control when a PRP request was applied to a prefix code.

#### **AF0154 - Cancel and Skip Controls**

Feature AF0154 enhances cancel-to (CANT), cancel-from (CANF), and skip (SKIP) network management group controls. This feature allows you to specify the percentage control levels for direct-routed (DR) and alternate-routed (AR) traffic when you apply these controls.

Before this feature, the percentage of traffic that you controlled was specified for DR or AR traffic, not DR and AR traffic. If you applied CANT, CANF, or SKIP controls to direct-routed traffic, you controlled alternate-routed traffic.

#### **AF0166 - Enhanced Code Controls**

Feature AF0166 allows you to apply and remove code controls to each numbering plan area (NPA) that an office serves. This feature alters the code control call gapping rate (interval and range). The interval is specified in tenths of seconds from 0.0 to 600.0 and not in intervals of 1 s from 0 to 360.

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**Network Management** (continued)

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The AF0166 feature allows the operational measurement (OM) to count calls that a code control passes, and does not block.

**AF0181 - Detection Enhancements of Machine Congestion Conditions**

Feature AF0181 allows you to trigger machine congestion (MC) Level 1 and Level 2 conditions. Use multi-frequency (MF) Queue Length or central processing unit (CPU) occupancy thresholds to trigger these conditions. Table NWMIDOC defines these thresholds. Machine congestion levels are known limits that the system uses to prompt the application of NWM controls. This feature combines the network management (NWM) selective incoming load control (NWMSILC) and NWM internal dynamic overload control (NWMIDOC) tables. This feature allows OMs for MC1 and MC2 conditions.

**AF0056 - NWM Trunk Group Control Interface Reorganization**

Feature AF0056 reorganizes the internal interface to the network management trunk group (TG) controls database. This reorganization extends the flexibility of the internal database. This extension allows you to add new network management abilities to the system.

**BC0070 - Code Controls -- Code Point Blocking 3-10 Digits**

Feature BT0251 creates CBK and PRP controls. The CBK is a code control that limits the entry of a specified percentage or rate of traffic to a network. The destination code of a specified call determines the limit. The system routes blocked traffic to emergency announcement 1 (EA1), emergency announcement 2 (EA2) or no circuit announcement (NCA) treatment. The percentage of calls blocked is from 1 to 100. The gap is set from 0.0 and 600.0 s in increases of one-tenth. You can apply CBK to a correct directory number (DN). This DN has a maximum of 10 digits.

The PRP is a code control that you use to measure traffic to specified codes. Use these measurements to determine when to apply code blocking controls.

**BR0250 - Directional Reservation Equipment (DRE)**

Feature BR0250 creates a group control that the system applies to specified two-way trunk groups. The DRE gives priority to incoming traffic. The DRE reserves a number of idle trunks in a group. When the control is active, the system skip-routes originating traffic.

Apply the DRE in steps or levels to indicate the required amount of control. These levels are the number of trunks you reserve in a trunk group. When you activate DRE and the level setting is reached, the system skip-routes the traffic (direct and alternate-routed) for the two-way group. The system skip-routes originating traffic that the trunks can carry. The system skip-routes the

## **Network Management (continued)**

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originating traffic until the number of idle trunks in the group is greater than the specified level.

### **BT0251 - Network Management Status Control I/O**

Feature BT0251, system status display, creates a three-line display for each control level of the MAP terminal. The lines always display the system state for different facilities and controls. This information includes controls active, billing information, mode of operation, initialization information, and other counts and percentages.

### **BT0251 - I/C Trunk Load Control**

Feature BT0251 creates incoming trunk busy (ITB). The ITB is a group control that limits incoming attempts. The ITB uses random selection to remove a percentage of incoming trunks with the remote make busy ability from service. You can apply this control to a trunk group. The trunk group is limited to incoming or two-way trunk groups equipped for remote make busy. You can set the percentage level of control in the range of 1 to 100. This percentage applies to the number of working trunks in the incoming trunk group. This percentage excludes the number of trunks that are offline.

The system periodically adjusts the number of incoming trunks in the NWM busy (NWMBsy) state. The system adjusts the number of trunks to compensate for trunks that the system returns to or removes from service. These adjustments keep the percentage setting constant.

### **BT0251 and BV0007 - Position and Display**

Features BT0251 and BV0007 provide a NWM subsystem in the MAP display. The MAP terminal is the main interface to the DMS-100 switch. Through inspection of the displays of data, the network manager can determine what action to take to clear or lessen conditions with faults. This feature sets up branches of controls at the NWM level that are grouped by function. Each branch has a menu of commands that allow queries or changes to the function and operation of a part of the switch. This part associates with a level or access to another level in the hierarchy.

### **BT0251 - O/G Trunk Group Control**

Feature BT0251 allows you to use outgoing trunk group controls. This feature makes internal changes to allow for these controls.

### **BT0251 - Route Controls -- Key Reroute**

Feature BT0251 creates the reroute (RRTE) control. This control allows the system to route a percentage of traffic from a designated route list to a different route list in the routing chain. This process is out-of-chain routing. The percentage level setting ranges from 1 to 100. You can enter a maximum of

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**Network Management** (continued)

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1024 reroute numbers (0 to 1023) in table REROUTE. Each reroute number can point to a maximum of 16 groups of routes and control percentage level settings. One setting can be active at a time. The operating company performs the first entry and changes required for table REROUTE and subtable NWMRROUT.

You can use the reroute control command, to bypass NWMRROUT, to override this control. You can use the route control menu or the CI commands to apply or remove the reroute control.

**BT0251 - Protective Reservation Equipment (PRE)**

Feature BT0251 creates PRE, a group control that you apply to specified two-way or outgoing trunk groups. This control prevents AR traffic through use of a trunk group. This control prevents traffic when the number of idle trunks in that group falls below a known level. DR traffic has full access to the trunk group.

The PRE reduces AR traffic during periods of heavy use on one trunk group. Apply the PRE in levels to indicate the required number of trunk groups. The system skip-routes the AR traffic on the trunk group under two conditions. The first condition is that the system activates the PRE. The second condition is that the number of idle trunks in the group reaches or falls below the specified level.

**BT0251 - Route Controls--Cancel From**

Feature BT0251 creates a group control that diverts traffic attempts that overflow from selected one-way outgoing or two-way trunk groups. CANF controls does not allow overflow traffic of a trunk group to transfer to the next group in the route list of trunks. This control blocks a set percentage level from direct routed and alternate routed traffic. The system routes the blocked calls to treatments NCA, EA1, or EA2. You can set the percentage level at the MAP terminal in the range of 0 to 100.

**BT0251 - Route Controls--Cancel To**

Feature BT0251 creates a group control that limits traffic attempts for one-way outgoing or two-way trunk groups. Application of the control blocks a percentage of traffic for a specified trunk group. Application of the control routes the traffic to treatment NCA, EA1, or EA2.

The control can affect a percentage of AR traffic, or all AR traffic and a percentage of DR traffic. You can set the percentage level at the MAP terminal in the range of 0 to 100.

## **Network Management (continued)**

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### **BT0251 - Route Controls--Skip Reroute**

Feature BT0251 creates a group control that limits a percentage of DR traffic for specified outgoing trunk groups. This control skip-routes the traffic of a specified group to the next trunk group in the routing chain. The percentage settings input at the MAP terminal are from 0 to 100.

### **BC0739 - Network Management Improvements**

Feature BC0739 adapts network management controls to accept the wider range of values that associate with serving translation scheme (STS). The serving numbering plan area (SNPA) accepts values less than 100. The STS does not accept values less than 100. The STS is compatible with SNPA over the range of SNPA values.

### **BC0623 - Country Code Blocking**

Feature BC0623 allows you to use country codes (CCODE) when you apply code controls. This feature extends code controls to include CCODEs and codes that begin with area codes (ACODE) and non-area codes (NAC).

### **BC0235 and BV0080 - Protective Reservation Equipment--Increased Number of Reserved Trunks (Mass Calling)**

Features BC0235 and BV0080 expand Group Controls PRE and DRE to increase the number of reserved trunks to 63. These commands place controls on trunk groups to reserve the controls for priority traffic.

### **BC1718 - Network Management Short CLLI Simplification**

Feature BC1718 simplifies the use of the NWM system to identify trunk groups with Common Language Location Identifiers (CLLI). This feature changes MAP commands and displays. This feature allows the use of full CLLIs and short CLLIs.

### **BC1722 - Network Management Trunk Group Data Reorganization**

Feature BC1722 allows you to define the maximum number of trunk groups that trunk group controls can control. This number is dynamic. The operating company can change this number.

## **Operation**

The features that affect translations appear in the following list.

- AF0582 - Prefix Code Controls

Feature AF0582 prevents the application of a code control against a PFX (carrier) code that is not in the office. The system cannot remove a current office PFX code if a code control is against the PFX code. You cannot



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## Network Management (continued)

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apply code controls to prefixes in non-equal access offices. Table OCCINFO specifies PFX codes.

This feature also requires that PFX code controls begin with 10XXX, 0XXX, or 9501XXX. For these codes, XXX represents the carrier digits that table OCCINFO defines.

- AF0154 - Cancel and Skip Controls

Feature AF0154 modifies the table PREPLANS parameter list for CANT, CANF, and SKIP network management entries. This feature removes the traffic-type selection parameter from table PREPLANS. This feature adds a second parameter for the second percentage level. These changes allow you to specify the percentage level traffic controls separately for AR and DR traffic.

- AF0096 - Flexible Reroute Controls

Feature AF0096 is for the public switch telephone network. This feature allows the system to reroute calls from an (FROM trunk group) in-chain route to a (TO trunk group) VIA route. The system reroutes calls to a VIA route when the in-chain route is overloads or fails.

A definition of flexible is that preprogramming reroutes are not necessary. Preprogramming reroutes are necessary for the reroute control (RRTE) on the DMS-100F.

- AF0181 - Detection Enhancements of Machine Congestion Conditions

Specified incoming load control (SILC) values are combined with incoming dynamic overload control (IDOC) machine congestion conditions MC1 and MC2. Table NWMSILC defines SILC values. Table NWMSILC is deleted. Table NWMIDOC is expanded to include threshold values for MC1 and MC2.

- BT0251 - Route Controls--Key Reroute

Feature BT0251 creates table REROUTE and subtable NWMRROUT. These tables list the routes to which the system reroutes traffic for a specified percentage of traffic busy.

- BC0623 - Country Code Blocking

Feature BC0623 creates table CCTR. Table CCTR defines CCODEs for code controls. Deletions or modifications are not allowed to an entry when code controls are in effect. To change this entry, remove the code control and perform a cold restart.

- BC1718 - Network Management Short CLI Simplification

Earlier, short CLIs identified a trunk group in a command or in a display. This feature allows the entry of the full CLI or short CLI in commands.

## Network Management (continued)

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A short CLLI was earlier required in the MAP commands. Displays that contain short CLLIs were changed to include the full CLLI and the related short CLLI.

The one exception occurs on the NWM top level display. The six short CLLIs that indicate the most recent finals in overflow condition (Fs) are not changed. The related full CLLIs do not appear.

If an entered string matches a short CLLI and a full CLLI, the system selects the trunk group for which the short CLLI has a match. The system searches the short CLLIs first for a match. If the system does not find a match, the system searches the full CLLIs. The system must use full CLLIs when short CLLIs duplicate.

- BC1722 - Network Management Trunk Group Data Reorganization

The office parameter NUM\_ENGR\_NWM\_TRKGRP\_CTRL in table OFCENG defines the maximum number of trunk groups that a set of trunk group controls can control. Definition of a value for this office parameter first occurs when the office is engineered. You can modify the value when the office is operational. You can use table control and perform a cold or reload restart.

- AF2087 - NWMSD Table Rewrite

Table NWMSD and subtable NWMSDPT was rewritten so that table NWMSDPT is a table that table NWMSD owns. Earlier, the data store for this table and subtable was set at initialization at 32 tuples. Changes require a patch. With this feature, the system dynamically allocates memory. Each site uses the required amount of memory for the table. The system allocates store for seven SD points in table NWMSDPT for each SD group in table NWMSD.

The function and datafill sequence of these tables does not change.

### Feature functionality

The following sections discuss the software functionality of features that NTX060AB introduces. The description of functionality of networks and NWM allows a complete understanding of feature package operation. A summary of network structures appears in the following section.

A hierarchical network contains three parts:

- switching systems
- traffic load
- trunk groups controls

Descriptions of these parts appear in the following sections.

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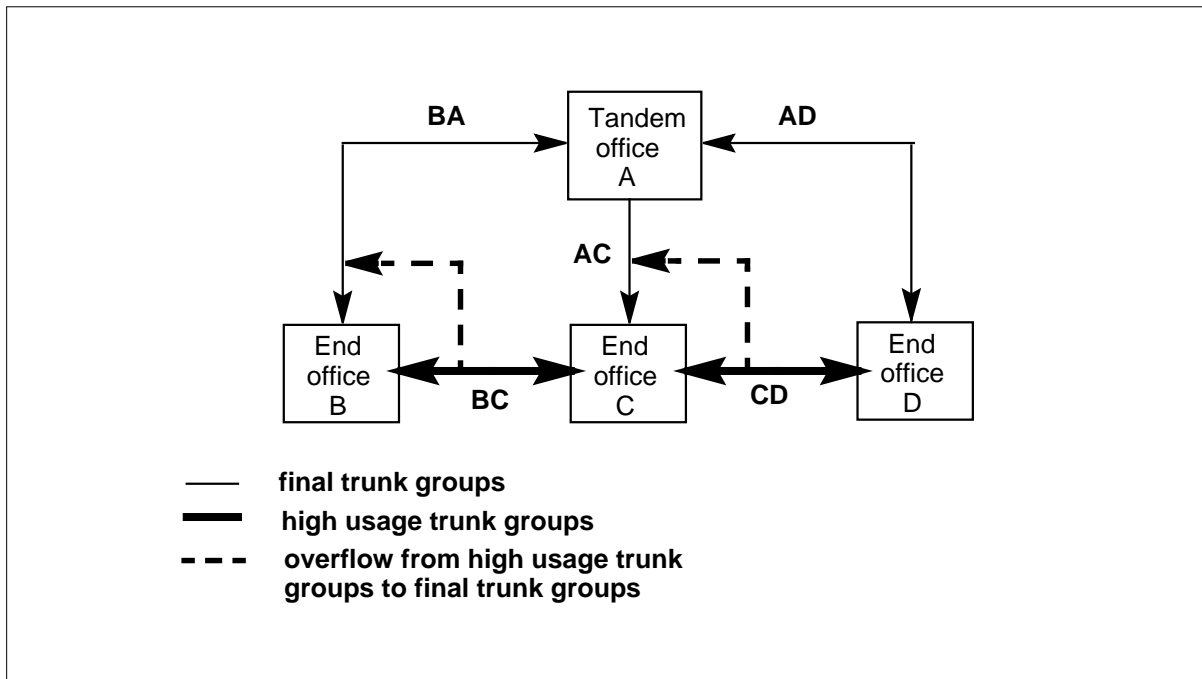
**Network Management** (continued)
 

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**Switching systems**

The level of the network switching system in the hierarchy determines the rank. The rankings are tandems and end offices. Tandems are ranked higher. End offices are ranked lower.

Tandems normally connect to other tandems and to a series of end offices through final trunk groups. End offices connect to other end offices through high-usage trunk groups. This arrangement allows end offices to route traffic to the destination office or to the tandem. An example network configuration appears in the following figure.

**Hierarchical public-switched telephone network**

End offices can route traffic through a network in one of the following ways:

- The originating end office tries to route a call over a direct trunk group. A direct trunk group interconnects the originating office to the destination office. Direct trunk groups are not always available to carry these calls. A direct trunk group can not be present at the destination office. A direct trunk group does not always have the idle capacity to carry the call.
- The system routes the call over a final trunk group to a tandem under two conditions. The first condition is when a direct trunk group to the destination office is not present. The second condition is when the direct trunk group cannot carry the call. After a call reaches the tandem switch, the tandem switch routes the call to the destination switch. The tandem

## Network Management (continued)

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switch routes the call over a final trunk group. The final trunk group connects the tandem switch to the destination switch. This approach offers a cost advantage. The system deploys less trunk groups in the network.

In practice, use these approaches when engineering a network. In the earlier figure, the network configuration uses direct trunk groups between some end offices. Final trunk groups are present between the tandem and the end offices.

The system can route calls that start in office B to office C over the direct trunk group (BC). The call overflows to the final trunk group (BA) to the tandem. The call overflows if the direct trunk group (BC) does not have the idle capacity to carry the call. The system can route the call to office C over trunk group AC.

If a call to office D starts at office B, the system must route the call to the tandem. The system routes the call to the tandem because a direct trunk group is not present from office B to D. The tandem routes the call to office D over trunk group AD.

### In-chain route lists

The location of the switching system in the network configuration determines the route plan of a switching system. A switching system routing plan contains a collection of in-chain route lists. The system uses in-chain route lists to route calls to connecting switching systems in the network. An in-chain route list holds a list of trunk groups. These trunk groups are candidates to carry each call to a connecting switching system in the network.

To route a call, the following aspects of the call determine the selection of an in-chain route list:

- call type
- class-of-service
- origination
- destination

The system stores trunk groups in each in-chain route list according to a specified selection order. The first route in the list is the preferred route. The system always chooses this route to carry a call. If the first trunk group is busy, the system offers the call to each following trunk group in the list. If every trunk group is busy, the call exhausted the in-chain route list. The system sends the call to treatment.

The first trunk group in each in-chain route list is a direct route. Subsequent trunk groups in each in-chain route list are alternate routes. For example, the

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## Network Management (continued)

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route plan for end office B in the figure "Hierarchical public-switched telephone network" contains two in-chain route lists. The system uses the first in-chain route list to route calls between end office B and end office C. The system uses second in-chain route list to route calls between end office B and end office D.

In the figure "Hierarchical public-switched telephone network", the first in-chain route list contains two trunk groups. The first trunk group is BC, the direct route. The system selects the BC, which is a direct trunk group. The BC is a primary high-usage trunk group. The BC overflows to an intermediate high-usage or a final trunk group. The system must specify a second trunk group. The second trunk group is BA. Trunk group BA is specified so that when a call cannot be carried over the direct trunk group, the call can be routed to the switching system. This switching system is at the next level higher in the network hierarchy. Trunk group BA is specified so that when trunk groups are not available, the call can be routed to the switching system. This switching system is at the next level higher in the network hierarchy. Trunk group BA is a final trunk group. The BA is a final trunk group. Because the BA group is a final trunk group, overflow calls are sent to treatment.

The second in-chain route list contains one trunk group. The first trunk group is BA. The system specifies the BA because when direct trunk groups cannot carry the call, the system routes the call. The system routes the call to a switching system. This switching system is at the next level higher in the network hierarchy. This route list does not contain alternate route because this trunk group is a direct final trunk group.

### Network trunk group types

Trunk groups carry calls between switching offices. The system routes calls over trunk groups from one switching system to another system. The system routes the calls until the calls reach the destination offices.

The categories of trunk groups in a hierarchical network appear in the following sections:

- primary high-usage  
A primary high-usage trunk group is a first option route. The system offers calls that overflow this trunk group to an intermediate high-usage or a final trunk group.
- intermediate high-usage  
Intermediate high-usage trunk groups accept overflow traffic from a primary high-usage trunk group. These trunk groups accept overflow traffic from another intermediate high-usage trunk group. The system

## Network Management (continued)

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offers calls that overflow intermediate high-usage trunk groups to other intermediate high-usage trunk groups or a final trunk group.

- final

A final trunk group accepts overflow calls from a high-usage or an intermediate high-usage trunk group. The system sends calls that overflow this trunk group to treatment.

- direct final

A direct final trunk group is a first option route. The system sends calls that overflow this trunk group to treatment.

### Traffic load

Anticipated calling patterns determine how networks are engineered. These calling patterns are called traffic load. The traffic load that the system offers to the network can exceed engineered capacity. When the traffic load exceeds network capacity, the network becomes congested and loses some ability to carry calls.

Traffic load contains calls that complete and calls that do not complete. Some reasons that calls do not complete include:

- called party busy
- called party not answering the phone
- facility failure
- busy trunks

Facility failures and busy trunks are two examples of network blocking.

Use Network Management Controls to reduce traffic load.

### Network management controls

Network Management Controls (NWM) is the supervision and control of telephone switching networks. The NWM guarantees maximum telephone traffic flow under negative or overload conditions. Negative conditions include periods of equipment failure or damage. The need for service from the switching office can exceed the ability of trunk groups to provide accurate service. The need for service can exceed the ability of common control equipment to provide accurate service. These conditions cause overload conditions.

NWM prevents the spread of telephone traffic congestion through the network. The NWM prevents the spread through the adjustment or restriction of normal telephone traffic patterns between a switch and connected offices. A series of

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## Network Management (continued)

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NWM controls alters these traffic patterns. The network management controls that NTX060AB introduces are protective or expansive controls.

Protective controls block or cancel telephone traffic that attempts to enter the network. Protective controls do not allow the system to route traffic over specified trunk groups.

Expansive controls reroute traffic to less loaded offices. These controls modify the available routes a call can take. This modification increases the possibility that a call reaches the correct destination.

You or the system can activate or deactivate NWM controls. The system activates controls when telephone traffic loads exceed preset thresholds. NWM personnel activate controls according to set thresholds. These controls measure, monitor, and manipulate telephone traffic flow in a network with the following methods:

- prevent the spread of traffic overload conditions
- use of available network circuits
- give priority to traffic types most likely to complete
- give priority to a specified number of calls when available circuits are in use

NWM controls divide in the following classes:

- automatic controls perform the following functions:
  - detect internal overload conditions
  - alert switches that connect of the congestion
  - respond to overload signals incoming from other switches
  - activate trunk group controls
  - route controls

Automatic controls perform the last two functions when calls exceed the known thresholds in the DMS switch.

- trunk group controls limit the amount of traffic that the system accepts from or offers to specified trunk groups. These controls expand the number of available routes for a call.
- code controls limit the number of calls to a specified destination code
- route controls modify an internal route list in the DMS-100 switch
- line load controls prioritize treatment of line originations

## **Network Management** (continued)

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Access NWM controls through the MAP terminal. The MAP terminal is the main interface to the DMS-100 switch. The MAP levels are for NWM and each branch of control. Each level contains menus. Use these menus to apply and remove commands, and to display system status information.

### **Automatic controls**

Automatic controls detect internal switching congestion and alert switches that connect of the congestion. These controls respond to overload signals from other switches. Automatic controls can activate trunk group controls or route controls when calls exceed known thresholds.

The DMS-100 switch supports the following protective automatic controls:

- IDOC detects internal overload conditions and alerts offices that connect of the congestion.
- Preplanned control (PPLN) responds to overload signals from connecting offices through the activation of trunk group controls.
- Selective dynamic overload control (SDOC) responds to overload signals from offices that connect. This control responds through the activation of trunk group controls on common channel interoffice signaling number 6 (CCIS6) trunk groups.

The DMS-100 switch supports the following extended automatic control:

- Automatic out-of-chain routing (AOCR) attempts to reroute traffic from a specified in-chain final trunk group to a specified alternate trunk group. The AOCR reroutes this traffic when the in-chain trunk group overflow rate exceeds a preset threshold.

Feature package NTX060BB, Network Management-Enhanced creates the automatic controls. The NTX060BB document describes the functionality of the DMS-100 switch automatic controls. Feature package NTX060AB modifies these controls to accept full CLLIs and short CLLIs.

### **Code controls**

Code controls limit the number of calls to a specified destination code.



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## Network Management (continued)

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The DMS-100 switch controls the following protective code controls:

- CBK does not allow the entry of a percentage or rate of traffic to the network by destination code.
- PRP maintains counts for traffic studies and to determine the need for code controls.
- HTRF flags codes as hard-to-reach. The system can block traffic with destination codes that flag as hard-to-reach. The system blocks traffic to allow calls that have a possibility of completion to use office resources.

Feature package NTX060BB creates CBK and PRP. The following sections describe the functionality of these controls. Feature package NTX060BB, Network Management-Enhanced creates HTRF. Feature package GFX060BB describes HTRF.

### Code blocking (CBK)

The code blocking (CBK) does not allow a specified percentage or rate of traffic to enter a network through destination code. The percentage of calls that the system blocks can range from 1 to 100. The call gapping rate can range from 0.0 to 600.0, in increases of one-tenth of a second. The system routes the blocked traffic to treatments. These treatments are NCA, EA1, or EA2.

You can apply or remove the CBK controls to a correct DN with 1 to 18 digits. The code types that the system normally blocks include CCODE, ACODE, non-area code (NAC), PFX code, and subscriber numbers. The area source of call congestion determines the selection of codes.

Use code control (CODECTRL) menu commands or the CI level command MASSCALL to apply or remove CBK commands. Use the APPLY command on CBK that use parameters blocktype, type, code, level, gap, ann, and snpa/sts. The blocktype indicates the method of block (PCT or GAP). The type is the code type that the system blocks (CCODE, ACODE, NAC or PFX). The code specifies the 1-digit to 18-digit number that the system blocks. The level parameter is the percentage of traffic that the system blocks (0 to 100). The gap indicates the interval between calls in tenths of seconds (0.0 to 600.0). The ann indicates the announcement type (EA1, EA2 or NCA). The Snpa/sts is a three-digit code (000 to 999) with a default of ALL.

The maximum allowed number of code controls that the user or the system activates is 256. A CBK control generates log report NWM110 and affects OM group CBK.

## Network Management (continued)

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### Preroute peg (PRP)

The preroute peg (PRP) requests allow the inspection of traffic levels that the system routes to specified destination codes. The PRP counts calls to destination codes CCODE, ACODE, NAC, or PFX. The count determines when you must activate CBK controls. The PRP does not block calls.

You can use CODECTRL menu commands or the CI level command PREPEG to apply PRP requests. You can use the APPLY command on PRP that use parameters type, code, and snpa/sts. The type indicates the affected code type (CCODE, ACODE, NAC or PFX). Code indicates the 1-digit to 18-digit number to which you apply the control. Code indicates the parameter snpa/sts is a three-digit code (000 to 999) with a default of ALL.

The maximum number of code controls that you or system can activate is 256. A PRP request generates log report NWM111 and affects OM group PRP.

### Trunk group controls

The NWM trunk group controls limit the amount of traffic that the system accepts from or offers to specified trunk groups. These controls modify the available routes a call can take. This modification increases the possibility that a call reaches the correct destination when the network is congested.

Activate trunk group controls from the group control (GRPCTRL) level of the MAP terminal. Automatic controls and scan points can activate trunk group controls through trunk group control entries in table PREPLANS.

The DMS-100 switch supports the following protective trunk group controls:

- Directional reservation equipment (DRE) gives priority to incoming calls on a controlled trunk group.
- Protective reservation equipment (PRE) gives priority to direct-routed calls that the system offers to a controlled trunk group.
- The CANT blocks calls that access a controlled trunk group.
- The SKIP does not allow the system to offer calls to a controlled trunk group. This action causes the calls to advance to the next trunk group in a route list.
- The CANF blocks calls that overflow a controlled trunk group.
- Incoming trunk busy (ITB) limits the amount of incoming calls on a controlled trunk group. This control occurs through the removal of a percentage of the trunks in a trunk group from service. The system

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## Network Management (continued)

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removes a percentage of the trunks if the number of idle trunks fall below a known threshold.

- Selective trunk reservation (STR) blocks outgoing calls when the number of idle trunks in a trunk group falls below a known threshold

The DMS-100 switch supports the following extended trunk group control:

- Flexible reroute (FRR) allows the system to reroute calls from an in-chain route to a VIA route. The system reroutes calls when the in-chain route is congested or fails.

Feature package NTX060AB creates DRE, PRE, CANT, CANF, SKIP, and ITB. The following sections discuss the functionality of these controls. Feature package NTX060BB creates STR and FRR. Feature package GFX060BB, Network Management-Enhanced discusses the functionality of STR and FRR.

### Directional reservation equipment (DRE)

The directional reservation equipment (DRE) gives priority to incoming traffic to reserve a number of idle trunks in a group. Apply this control to selected two-way trunk groups. When you apply this control, the system skip-routes originating traffic.

The system applies DRE in steps or levels to indicate the required amount of control. These levels are the number of reserved trunks in a trunk group. The levels range from 1 to 63 trunks.

When the system applies DRE and the level setting is reached, the system skip-routes traffic AR and DR. The system offers the AR and DR traffic to the two-way group. The system skip-routes originating traffic. The system skip-routes the traffic until the number of idle trunks in the group is greater than the specified level.

Use GRPCTRL menu commands to apply DRE control. To apply DRE, SELECT the trunk group, and use the level parameter to APPLY DRE. This parameter specifies the number (1 to 63) of reserved trunks in a trunk group. A DRE control generates log report NWM100.

### Protective reservation equipment (PRE)

The protective reservation equipment (PRE) reduces AR traffic during periods of heavy use on a trunk group. The PRE skip-routes traffic to act on AR traffic that the system offers to a selected two-way or outgoing trunk. This control does not allow AR traffic to use a trunk. The AR traffic cannot use trunks when the number of idle trunks in that group falls below a known level. The DR traffic has full access.

## **Network Management** (continued)

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Apply the PRE in steps or levels to indicate the required amount of control. These levels are the number of reserved trunks in a trunk group. The levels range from 1 to 63 trunks. The system skip-routes the AR traffic on the trunk group. The system skip-routes AR traffic when you apply PRE and the number of idle trunks in the group reaches or falls below this level.

Use the GRPCTRL menu commands to apply PRE control. To apply PRE, SELECT the trunk group, and use the level parameter to APPLY PRE. This parameter specifies the number (1 to 63) of reserved trunks in a trunk group. A PRE control generates log report NWM101.

### **Cancel-to (CANT)**

The cancel-to (CANT) limits traffic attempts that the system offers to one-way outgoing or two-way trunk groups. When you apply the CANT control, the system blocks a percentage of traffic that the system offers to a trunk group. The system routes the traffic to treatments NCA, EA1, or EA2.

The CANT controls can affect a percentage of AR traffic or DR traffic or AR and DR traffic. Set the percentage level at the MAP terminal in the range of 0 to 100.

Use GRPCTRL menu commands to apply the CANT control. To apply CANT, SELECT the trunk group, and use parameters ar\_pct, dr\_pct, and ann to APPLY CANT. The ar\_pct and dr\_pct parameters indicate the percentage of affected AR and DR traffic. The ann parameter indicates the announcement to which calls connect. An announcement can be NCA, EA1, or EA2. A CANT control generates log report NWM102.

### **Cancel-from (CANF)**

The cancel-from (CANF) diverts traffic attempts that overflow from specified one-way outgoing or two-way trunk groups. The CANF routes the traffic to treatments NCA, EA1, or EA2. This control does not allow the traffic overflow of a trunk group to continue to the next group in the route list.

The CANF controls can affect a percentage of AR traffic, DR traffic, or AR and DR traffic. Set the percentage level at the MAP terminal in the range 0 to 100.

Use GRPCTRL menu commands to apply the CANF control. To apply CANF, SELECT the trunk group, and use parameters ar\_pct, dr\_pct, and ANN to APPLY CANF. The ar\_pct and dr\_pct parameters indicate the percentage of affected AR and DR traffic. The ANN parameter denotes the announcement to which calls connect. An announcement can be NCA, EA1, or EA2. A CANF control generates log report NWM103.

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**Network Management** (continued)

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**Skip (SKIP)**

The SKIP limits traffic that the system offers to specified outgoing trunk groups. This control skip-routes the traffic of a specified group to the next trunk group in the routing chain. Use a reroute with this control to achieve immediate reroute function.

The SKIP controls affect a percentage of AR and DR traffic. Set the percentage level at the MAP terminal in the range 0 to 100.

Use group control (GRPCTRL) menu commands to apply the SKIP control. To apply SKIP, first SELECT the trunk group, and use parameters ar\_pct and dr\_pct to APPLY SKIP. These parameters indicate the percentage (0 to 100) of affected AR and DR traffic. A SKIP control generates log report NWM104.

**Incoming trunk busy (ITB)**

The incoming trunk busy (ITB) limits incoming call attempts. The ITB removes from service (making busy) a select percentage of incoming trunks with the remote make busy capability. You can apply this control to different trunk groups. Apply this control to incoming or two-way trunk groups equipped for remote make busy. Definition of trunk groups occurs for remote make busy in field REMBSY of table TRKSGRP.

Set the percentage level of control at the MAP terminal in the range of 0 to 100. This percentage applies to the number of working trunks in the incoming trunk group and excludes the number offline. The number of working trunks appears in the system status display of the MAP terminal.

The system often adjusts the number of incoming trunks in the network management busy (NWMBsy) state. The system performs this adjustment to compensate for trunks that the system returns to or removes from service. This adjustment keeps the percentage setting constant.

Use GRPCTRL menu commands to apply the ITB control. To apply ITB, SELECT the trunk group, and use the level parameter to APPLY ITB. This parameter denotes the percentage (0 to 100) of traffic affected. An ITB control generates log report NWM105.

**Multiple trunk group controls and sequencing**

Trunk group controls are pre-hunt trunk group controls or post-hunt trunk group controls. Pre-hunt trunk group controls affect calls before the controls make attempts on controlled trunk groups. Post-hunt trunk group controls affect calls after the calls overflow the controlled trunk group.

## **Network Management** (continued)

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You can apply more than one trunk group control in a controlled trunk group. When a call encounters a controlled trunk group, the sequence in which trunk group controls are addressed in the DMS-100 switch differs. The sequence differs for pre-hunt and post-hunt group controls. For pre-hunt trunk group controls, the sequence is DRE to PRE to CANT to SKIP. For post-hunt trunk group controls, the sequence is DRE to PRE to CANF to SKIP.

A call remains subject to CANF control under two conditions. The first condition is that a call access a trunk group in which you applied a DRE, PRE, or SKIP trunk group control. The second condition is that one of these controls affect the call. The call remains subject to CANF control if you also apply this control to the trunk group.

### **Route controls**

Route controls allow the system to reroute traffic through route lists that the routing chain does not specify. The DMS-100 switch supports the RRTE control. The RRTE control allows the system to reroute a percentage of traffic from a designated route list to a different route list in the routing chain. Feature package NTX060AB created RRTE. The following section describes RRTE.

### **Reroute (RRTE)**

The RRTE controls allows the system to reroute a percentage of traffic from a designated route list to a different route list in the routing chain. This process is called out-of-chain routing. The out-of-chain routing occurs through the use of additional preprogrammed translation tables.

You can enter a maximum of 1024 reroute numbers in table REROUTE. Each reroute number can point to a maximum of 16 groups of routes and control percentage level settings. Subtable NWMRROUT defines these settings. The percentage settings range from 1 to 100. One group can be active at one time.

The operating company performs the first data entry and subsequent changes for table REROUTE and subtable NWMRROU.

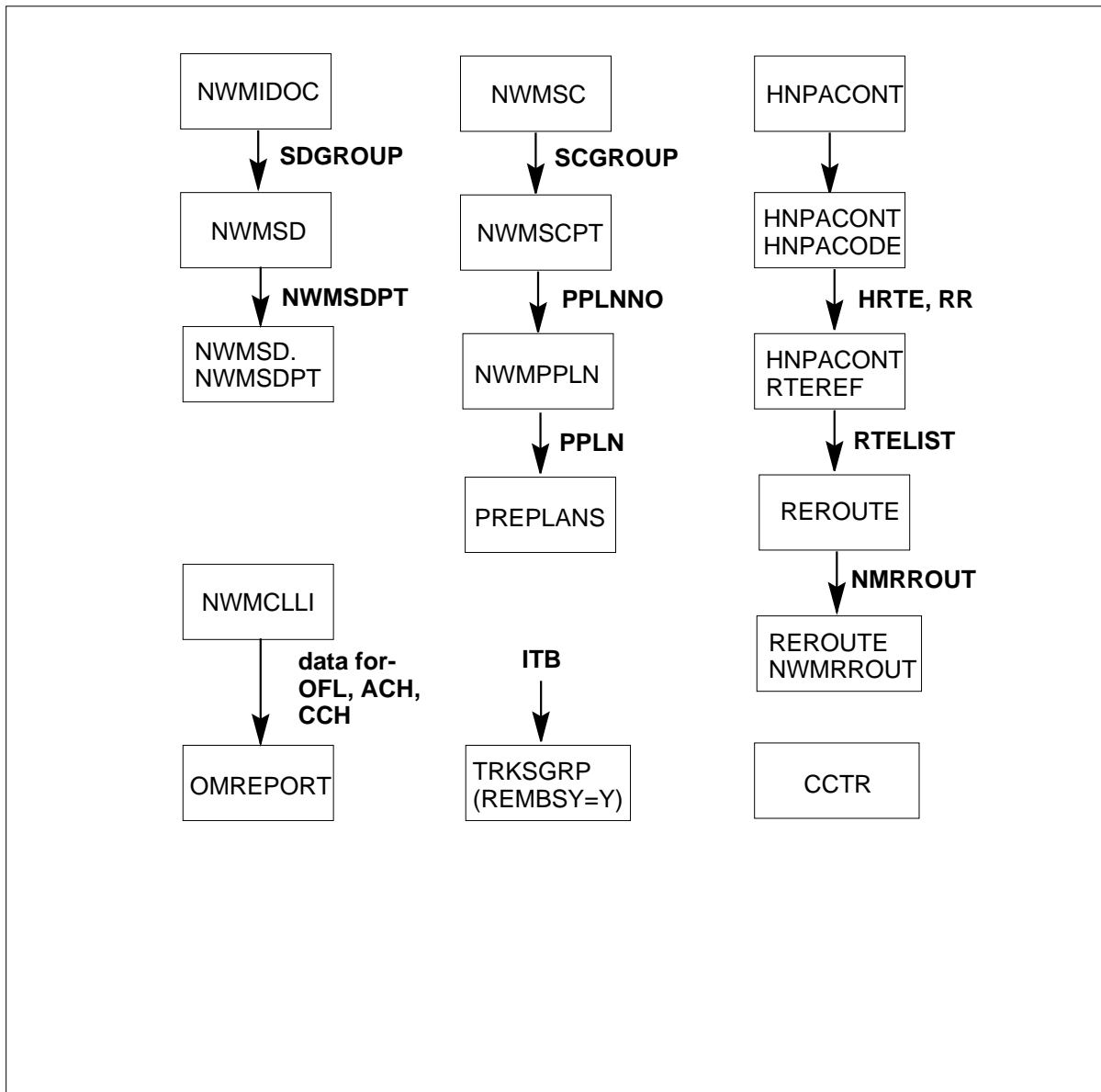
You can use the reroute control command to perform a temporary override of the percentage value set in subtable NWMRROUT. Use the route control (RTECTRL) menu commands or REROUT CI level commands to apply or remove the reroute control. Use parameters rrtno, rrtsub, and level to APPLY RRTE. The parameter rrtno is the range of reroute number (0 to 1023). The rrtsub parameter is the index number (0 to 15) that associates with the out-of-chain route that the system chooses. The level indicates the percentage (0 to 100) of the traffic that the system diverts to the new route. The level is required if the percentage differs from the preprogrammed percentage. A reroute control generates log report NWM120.

**Network Management** (continued)

**Translations table flow**

The Network Management translation process appears in the following flowchart.

**Table flow for Network Management**



## Network Management (continued)

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### Limits

The following limits apply to Network Management:

- group controls

You can apply the CANT, SKIP, and CANF group controls on outgoing or two-way trunk groups. You cannot apply these controls on incoming trunk groups. Different groups of percentages for AR and DR traffic are allowed, except when AR and DR control levels are zero.

- code controls

- ALL option

When you apply a code control with the ALL option, remove that control with the ALL option of the remove command.

If the system does not specify an NPA, the system uses the first entry in table HNPACONT.

Remove the code controls that you apply on a single serving numbering plan area/serving translation scheme (SNPA/STS). Remove these controls before the ALL option of the APPLY command can work on each NPA that the office serves. If you apply a code control against a single SNPA/STS, that SNPA/STS cannot change to ALL without the removal of the original control.

Enclose the value for the SNPA/STS field of the SNPA/STS ALL parameter with single quotes when you enter the value at the MAP terminal.

- call gapping

The system must activate call gaps from least precise to most precise. When you specify code block call gapping values, include a decimal point. Enclose call gapping values with single quotes. For example, 600.0. The number of qualified call gaps depends on the number of HNPAs in the office.

- prefix codes

You cannot apply a code control against a prefix code that is not in that office. A prefix code is a carrier code. You cannot remove a current office prefix code if a code control is present against the prefix code. The system does not consider dialing codes 950 and 0ZZ as PFX codes.

If you apply more than one control against an equal access call, apply the most precise control to the call.

Apply a prefix code control in Equal Access (EA) offices. The digit collection method and translations limit the number of digits that the system can be blocked for an EA call. The system performs prefix



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**Network Management** (continued)

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code blocking when the system receives enough digits from the peripheral to determine a LATA status. Table LATAXLA specifies the LATA status for the digits the subscriber dials.

For example, when 10XXX-NPA-NXX-XXXX is 10121-314-333-4881, the system receives the digits in the following order. This order depends on your office:

- 10121-314
- 333
- 4
- 881

Table LATAXLA contains the following tuple: LATA1 3143 INTER INTER STD. Application of code blocking on 10121 through 10121-314-333 blocks the called number. Application of code blocking on 10121-314-333-4 does not block the called number.

Equal access identifies the LATA status after the system collects the 10XXX-NPA-NXX. The system does not block the later call because equal access translations is complete. To block this number, enter 3143334 in table LATAXLA.

— parameters CBK and PRP

The total of the field values of parameters CBK and PRP must be less than 256.

— area/non-area codes

The ACODE control implementation was modified. The NPA against which you apply the control can match the NPA in the destination code. For this condition, the system removes the NPA from the destination code for that entry. This change allows an ACODE control to act like an ACODE and an NAC control.

For example, 613 and 819 are two NPAs entered in table HNPACONT. If you apply an ACODE control against 613621 for the 613 translation

## Network Management (continued)

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table, the system starts the control internally. The system starts the control as an NAC control against 621.

If you apply an ACODE control against 613621 for the 819 translation table, the system starts the control internally. The system starts the control as an ACODE control against 613621.

If you can apply multiple controls against a single call, apply the most precise control first.

— country codes

The CCODE controls are applied to the country code level. The system ignores additional digits in the called number.

## Interactions

The following paragraphs describe the interactions between Network Management and other functionalities.

Feature package NTX060AB Network Management uses feature packages NTX000AA Bilge and NTX001AA Common Basic. Feature package NTX060BB Network Management-Enhanced requires the NTX060AB. Some modifications that feature package NTX060AB produces only function in offices that contain feature package NTX060BB. Descriptions of these modifications appear in the following paragraphs.

The PFX codes are code controls that NTX060BB creates. Code control changes that NTX060AB makes, that apply to PFX codes, appear in the following list:

- You can apply CBK or HTRF code control to a PFX code when the system applies a PRP request.
- Call gapping can be specified in tenths of seconds from 0.0 to 600.0 s when the system applies call gapping to PFX codes.

The NTX060BB creates the AUTOMATIC controls and the AUTOCTRL level of the MAP terminal. Modifications that NTX060AB produces, that deal with automatic controls, appear in the following list:

- The system can use full CLLIs and short CLLIs for commands and displays in the auto control (AUTOCTRL) level of the MAP terminal.
- The system deletes selective incoming load control (SILC) information from log report NWM130.
- Tables NWMSILC and NWMIDOC combine to create table NWMIDOC.

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## Network Management (continued)

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- The system eliminates SILC controls from the AUTOCTRL level of the MAP display.
- The system creates OM group MACHCONG for machine congestion (MC) levels MC1 and MC2.

### Activation/deactivation by the end user

Network Management does not require activation or deactivation by the end user.

### Billing

Network Management does not affect billing.

### Station Message Detail Recording

Network Management does not affect Station Message Detail Recording.

### Datafilling office parameters

The office parameter that Network Management uses appear in the following table. See the *Office Parameters Reference Manual* for additional information about office parameters.

#### Office parameters by Network Management

Table name	Parameter name	Description
OFCENG	NUM_ENGR_NWM_TRKGRP_CTRL	This parameter identifies the number of trunk groups that trunk group controls can control at the same time. The range is 0 to 255.

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## Network Management (continued)

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### Datafill sequence

The tables that require datafill to implement Network Management appear in the following table. The tables appear in the correct entry order.

#### Datafill tables required for Network Management (Sheet 1 of 2)

Table	Purpose of table
OFCENG	Office Engineering. This table contains data on engineering parameters for the office. Refer to How to enter office parameters for how Network Management affects office parameters.
NWMIDOC	Network Management Internal Dynamic Overload Control. This table lists, for machine congestion levels 1 and 2: <ul style="list-style-type: none"> <li>• signal distribution group and point assignments</li> <li>• the ON threshold and length of time congestion exceeds threshold before control activation</li> <li>• the OFF threshold and the length of time congestion exceeds threshold before control activation</li> </ul>
NWMSD	Network Management Signal Distributor Group. This table identifies the SD circuit location and type of card for each SD group assigned to network management.
NWMSDPT	Network Management Signal Distributor Point. This table defines signal distribution points.
HNPACONT	List of Home NPA (HNPA) Code Subtables. This table defines reroute.
HNPACONT. HNPACODE	HNPA Code Subtable. This table defines reroute.
HNPACONT. RTEREF	HNPA Route Reference Subtable. This table defines reroute.
REROUTE	Network Management Reroute Control. This table defines reroute.
REROUTE. NWMRRROUT	Network Management Reroute Subtable. This table defines reroute.
NWMSC	Network Management Scan Group. This table contains the switch-dependent data for each of the network management scan groups. The data contains the PEC of the scan card and the location of the card.
NWMSCPT	Network Management Scan Point. This table identifies the function that each assigned scan point performs in the network management scan groups.

**Network Management** (continued)**Datafill tables required for Network Management (Sheet 2 of 2)**

<b>Table</b>	<b>Purpose of table</b>
NWMPPLN	Network Management Preplan Control. This lists the maximum number of trunk groups assigned to each preplan in the table. Table NWMPPLN specifies if entries in table CCSDOC or table NWMSCPT reference the preplan.
PREPLANS	Network Management Preplan. This table lists, for each network management preplan, the short CLLI to which the preplan applies. This table also lists the type of control that applies to the preplan.
CCTR	Country Code. This table defines country codes.
NWMCLLI	Network Management CLLI. This table selects OM data.
OMREPORT	Operational Measurements Report. This table defines OM report.
TRKSGRP	Trunk Subgroup. This table lists the supplementary information for each subgroup assigned to one of the trunk groups that appear in table TRKGRP.

**Datafilling table NWMIDOC**

Datafill for Network Management for table NWMIDOC appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NWMIDOC (Sheet 1 of 2)**

<b>Field</b>	<b>Subfield or refinement</b>	<b>Entry</b>	<b>Description</b>
MFONTHLD		0 to 100	MF receiver queue length threshold on value to activate control. This field is new. Range is 0 to 100 for levels 1 and 2. For level 3, enter 1. A default is not available.
MFOFTHLD		0 to 100	MF receiver queue length threshold off value to deactivate control. This field is new. Range is 0 to 100 for levels 1 and 2. For level 3, enter 1. A default is not available.

## Network Management (continued)

### Datafilling table NWMIDOC (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Description
CPONTHLD		0 to 100	CPU occupancy threshold on value to activate control. This field is new. Range is 0 to 100 for levels 1 and 2. For level 3, enter 1. A default is not available.
CPOFTHLD		0 to 100	CPU occupancy threshold off value to deactivate control. This field is new. Range is 0 to 100 for levels 1 and 2. For level 3, enter 1. A default is not available.

### Datafill example for table NWMIDOC

Sample datafill for table NWMIDOC appears in the following example.

### MAP example for table NWMIDOC

IDOCLEV	MFONTHLD	MFONFILT	MFOFTHLD	MFOFFILT	CPONTHLD
CPONFILT	CPOFTHLD	CPOFFILT	SDGROUP	SDPT	
1	2	2	2	2	4
	2	4	2	0	3

## Datafilling table NWMSD

Datafill for Network Management for table NWMSD appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

### Datafilling table NWMSD

Field	Subfield or refinement	Entry	Description
This package does not change this table.			

### Datafill example for table NWMSD

Sample datafill for table NWMSD appears in the following example.

**Network Management** (continued)

**MAP example for table NWMSD**

NWMSDGRP	TMTYPE	TMNO	TMCCTNO	CARDCODE
0	MTM	4	4	2X57AA
1	MTM	4	5	2X57AA

**Datafilling table NWMSDPT**

Datafill for Network Management for table NWMSDPT appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NWMSDPT**

Field	Subfield or refinement	Entry	Description
This package does not change this table.			

**Datafill example for table NWMSDPT**

Sample datafill for table NWMSDPT appears in the following example.

**MAP example for table NWMSDPT**

SDGRPPT		NORMST	SDDATA
0	0	0	IDOC1
0	1	0	IDOC2
0	2	0	FREE
0	3	0	FREE

**Datafilling subtable HNPACONT.RTEREF**

Datafill for Network Management for subtable HNPACONT.RTEREF appears in the following table. The fields that apply to Network Management appear

## Network Management (continued)

in this table. See the data schema section of this document for a description of the other fields.

### Datafilling subtable HNPACONT.RTEREF

Field	Subfield or refinement	Entry	Description
RTELIST	TABID	RRTE	Table identification. Enter RRTE for reroute.

### Datafill example for subtable HNPACONT.RTEREF

Sample datafill for subtable HNPACONT.RTEREF appears in the following example.

### MAP example for subtable HNPACONT.RTEREF

RTE	RTELIST
-----	
0	N D CINNC4ETC2I 0 N N T RRTE 0 \$

## Datafilling table REROUTE

Datafill for Network Management for table REROUTE appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

### Datafilling table REROUTE

Field	Subfield or refinement	Entry	Description
RRTNO		0 to 1023	Reroute number. Range is 0 to 1023.
NWMRROUT		0 to 15	Index into subtable REROUTE.NWMRROUT. This type does not accept input on output. The used space field appears.

### Datafill example for table REROUTE

Sample datafill for table REROUTE appears in the following example.



**Network Management** (continued)

**MAP example for table REROUTE**

RRTNO	NWMRROUT
0	3
1	4

**Datafilling subtable REROUTE.NWMRROUT**

Datafill for Network Management for table REROUTE.NWMRROUT appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling subtable REROUTE.NWMRROUT**

Field	Subfield or refinement	Entry	Description
RRTSUB		0 to 15	Reroute subtable index. Enter the index number from 0 to 15.
NEWROUTE		see subfields	New route. This field contains subfields TABID and KEY.
	TABID	IBNRTE, IBNRTE2, IBNRTE3, IBNRTE4, OFRT, or OVR0 to OVR9	Table identification. In a local or toll office, enter OFRT (for table Office Route) or one of the IBNRTE (Integrated Business Network Route) tables to which the system redirects the percentage of traffic (level). The system redirects the traffic if the system activates the Reroute feature.  In a DMS-300 office, enter OVR0 to OVR9 (Overseas Route) to which the system redirects the percentage of traffic (level). The system redirects the traffic if the system activates the Network Management Reroute feature.
	KEY	0 to 1023	Key. Enter the percentage of traffic that the system redirects when the system activates the Network Management Reroute feature.
LEVEL		0 to 100	Level. Enter the percentage of traffic that the system redirects when the system activates the Network Management Reroute feature.

## Network Management (continued)

### Datafill example for subtable REROUTE.NWMRROUT

Sample datafill for subtable REROUTE.NWMRROUT appears in the following example.

#### MAP example for subtable REROUTE.NWMRROUT

RRTSUB	NEWROUTE	LEVEL
0	OFRT 110	100
1	OFRT 111	50
2	OFRT 110	100
3	OFRT 111	50

### Datafilling table NWMSC

Datafill for Network Management for table NWMSC appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

#### Datafilling table NWMSC

Field	Subfield or refinement	Entry	Description
This package does not change this table.			

### Datafill example for table NWMSC

Sample datafill for table NWMSC appears in the following example.

#### MAP example for table NWMSC

SCGROUP	TMTYPE	TMNO	TMCCTNO	CARDCODE
0	MTM	5	6	0X10AA
1	MTM	5	7	0X10AA
2	MTM	6	4	0X10AA
3	MTM	6	5	0X10AA

**Network Management** (continued)

**Datafilling table NWMSCPT**

Datafill for Network Management for table NWMSCPT appear in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NWMSCPT**

Field	Subfield or refinement	Entry	Description
This package does not change this table.			

**Datafill example for table NWMSCPT**

Sample datafill for table NWMSCPT appears in the following example.

**MAP example for table NWMSCPT**

SCGRPPT	NORMST	SCDATA
0 0	0	RRTE 0 2
0 1	0	RRTE 0 3
.	.	.
1 0	0	PPLN 0
1 1	0	PPLN 1

**Datafilling table NWMPPPLN**

Datafill for Network Management for table NWMPPPLN appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NWMPPPLN**

Field	Subfield or refinement	Entry	Description
This package does not change this table.			

**Datafill example for table NWMPPPLN**

Sample datafill for table NWMPPPLN appears in the following example.

## Network Management (continued)

### MAP example for table NWMSCTP

PPLN	NCTRLS	CCS
0	8	N
1	8	N

### Datafilling table PREPLANS

Datafill for Network Management for table PREPLANS appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

#### Datafilling table PREPLANS

Field	Subfield or refinement	Entry	Description
CTRL		BSSKIP, CANF, CANT, DRE, FRR, ITB, ITO, PRE, SKIP, STR, TASI	Control data. This field specifies the trunk group control parameters. For the cancel from control type, enter CANF and datafill refinements DRPCT and ARPCT. For the cancel to control type, enter CANT and datafill refinements DRPCT, ARPCT, and ANN.
	DRPCT	0 to 100	Direct routed percentage traffic selector. Enter a number to determine the percentage of CANF DR traffic or controlled DR traffic.
	ARPCT	0 to 100	Alternate routed percentage traffic selector. Enter a number to determine the percentage of CANF DR traffic or controlled DR traffic.
	ANN	NCA, EA1, EA2	Announcement. Enter the announcement to which the system routes blocked calls: NCA, EA1, or EA2.

### Datafill example for table PREPLANS

Sample datafill for table PREPLANS appears in the following example.

**Network Management** (continued)

**MAP example for table PREPLANS**

PPLN	SCLLI	CTRL	CTRLDATA
0 0	CLINIT	CANT	50 100 NCA
0 1	CLINTIT	CANT	50 100 EA2
0 2	CLINIT	CANF	50 100 NCA

**Datafilling table CCTR**

Datafill for Network Management for table CCTR appears in the following table. The fields that apply to Network Management appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table CCTR (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Description
GIVENCC		see subfields	Given country code. This field contains subfield CCSEL and refinement PCC.
	CCSEL	T or P	Country code selector. Enter T for true country and datafill refinement PCC. Enter P for pseudo country code and skip to field MINDIGSR.
	PCC	alphanumeric (a maximum of 8 digits) or N	Pseudo country code. If subfield CCSEL is set to T and the switching unit is toll or combined local and toll, enter a pseudo country code. If switching unit is local, enter N.
MINDIGSR		0 to 18	Minimum digits required. Enter the minimum number of required digits. Include the country code.
MAXDIGSR		0 to 25	Maximum digits required. Enter the maximum number of required digits. Include the country code.
TMTORRTE		see subfields	Treatment or route reference. This field contains subfield TRSEL.
	TRSEL	T or D	Treatment or route selector. Enter D if translation routes to a treatment and datafill refinement TREAT. Enter T if translation routes to office route table and datafill refinement TUPID.

## Network Management (continued)

### Datafilling table CCTR (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Description
	TREAT	alphanumeric (a maximum of 4 characters)	Treatment. If the entry in subfield TRSEL is D, enter the treatment to which translation routes.
	TUBID	see subfields	Treatment or route reference. This refinement contains subfields TABID and KEY.
	TABID	OFRT	Table name. Enter OFRT for the office route table.
	KEY	1 to 1023	Index. Enter the index in the office route table to which translation routes.
	CUSTDIAL	Y or N	Route reference customer dialed. Enter Y if customer can dial. If the customer cannot dial, enter N.  The system routes the originator to reorder treatment RODR under two conditions. The first condition is that the call originate from a local source. This source is line, incoming CAMA trunk, or local trunk with local source of origination. The second condition is that subfield CUSTDIAL be N.

### Datafill example for table CCTR

Sample datafill for table CCTR appears in the following example.

### MAP example for table CCTR

CCNAME	GIVENCC	MINDIGSR	MAXDIGSR	TMTORRTE
44 T	044	6	12	T OFRT 6 Y
57 P		6	12	D VACT

### Datafilling table TRKSGRP

Datafill for Network Management for table TRKSGRP appears in the following table. The fields that apply to Network Management appear in this

## Network Management (end)

table. See the data schema section of this document for a description of the other fields.

### Datafilling table TRKSGRP

Field	Subfield or refinement	Entry	Descriptions
SGRPVAR		see refinement	Variable subgroup data. This field contains several subfields and refinements.
	REMBSY	Y	Remote make busy. The incoming trunk busy (ITB) control limits incoming call attempts. The control removes from service a percentage of incoming or two-way trunks equipped for remote make busy. These trunks have field REMBSY = Y.

### Datafill example for table TRKSGRP

Sample datafill for table TRKSGRP appears in the following example.

#### MAP example for table TRKSGRP

SGRPKEY	CARDCODE	SGRPVAR
-----		
TDAOIC 0	DS1SIG	STD IC MF WK N 10 10 N N N N Y M

### Tools for verifying translations

Network Management does not use tools for verifying translations.

### SERVORD

Network Management doesot use SERVORD.

## Network Management - Enhanced

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### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS29 and later versions

### Requirements

Network Management - Enhanced does not have requirements.

### Description

This feature allows the following events to occur:

- supervision and control of network traffic
- prevention of traffic congestion
- the use of Network Management (NWM) controls.

#### **BT0251 - Dynamic Overload Control**

Dynamic Overload Control (DOC) is a signaling control that the system uses to automatically transmit signals. The signals transmit to connecting offices when the system detects switching congestion. Connecting offices use transmitted signals. These signals indicate the level of outgoing trunk group control that the system requires to reduce traffic to the congested office.

The internal dynamic overload control (IDOC) is the generation of signals. Overloads that the system detects internally cause this generation of signals. The DOC uses three levels of signaling to indicate three levels of machine congestion. Machine congestion is switching overload.

The first two signal levels are Level 1 and Level 2. The system transmits these levels when the multifrequency (MF) receiver queue length exceeds a specified threshold. The system transmits these levels when the CPU occupancy exceeds a specified threshold. Table NWMIDOC defines the receiver queue length thresholds and the central processing unit (CPU) occupancy thresholds. The system transmits level 3 signals if the office loses processing capabilities. Office parameter SDOC3\_ENABLE of table OFCOPT controls automatic transmission of Level 3 signals.

The system automatically transmits or removes IDOC signals. This event occurs when overload conditions occur above and below the different threshold values. Table NWMIDOC contains the threshold values. You can



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**Network Management - Enhanced** (continued)

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manually activate IDOC level signals at the AUTOCTRL level of the MAP display.

The DOC responds to remote signals that connecting offices that are congested transmit. The DOC responds to remote signals. The DOC automatically applies trunk group controls to reduce outgoing traffic to the congested office.

The preplanned (PPLN) controls in table PREPLANS enable the response to remote DOC signals. The PPLN control uses entries in tables NWMPPLN and PREPLANS to activate trunk group controls. The preplanned (PPLN) control activates manually or automatically. Manual activation occurs from the AUTOCTRL level of the MAP display. Automatic activation uses table NWMSCPT to associate scan points with preplanned control entries in table PREPLANS.

**BR0018 - Automatic Out-of-Chain Routing**

Automatic Out-of-Chain Routing (AOCR) is an automatic control that allows the system to reroute calls. These calls overflow the in-chain final trunk groups to a specified alternate route. The AOCR monitors the controlled trunk group. The AOCR attempts to reroute calls only if the overflow rate exceeds a percentage threshold that table NWMAOCR defines. Before a reroute can occur, the overflow rate of the alternate route must not exceed a second percentage threshold. The threshold for the overflow rate of the alternate route appears in table NWMAOCR. The AOCR activates or deactivates reroute controls in intervals of 5 min. Table NWMAOCR contains the following:

- the in-chain route percentage threshold
- the alternate route percentage threshold
- the index that subtable NWMRROUT of table REROUTE activates.

**BR0018 - Selective Trunk Reservation**

Selective Trunk Reservation (STR) is a trunk group control that monitors and controls the number of idle trunks. These trunks are present in an outgoing or two-way trunk group. The STR uses two values to define idle trunk threshold levels. The two values are Lev1 and Lev2. The Lev1 threshold always indicates less congestion than the Lev2 threshold. The Lev1 always has a higher idle trunk setting than Lev2.

Each threshold level has an associated traffic control percentage. The STR operates with a BC0023 and a hard-to-reach (HTR) code list. The STR can block the following percentages of traffic:

- direct-routed
- alternate routed

## **Network Management - Enhanced** (continued)

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- hard-to-reach direct-routed
- hard-to-reach alternate-routed

The number of idle trunks in the controlled trunk group can fall between the values defined for Lev1 and Lev2. When this event occurs, the system blocks the specified percentage of direct-routed and alternate-routed traffic that goes to hard-to-reach areas.

If the number of idle trunks falls below the value defined for Lev2, the system blocks the following traffic routes:

- 75% of HTR direct-routed traffic
- 100% of HTR alternate-routed traffic
- 100% of alternate-routed traffic
- the specified percentage of direct-routed traffic

You can apply the STR at the group control (GRPCTRL) level of the MAP display. The system can use entries in table PREPLANS to activate the STR automatically.

### **BC0023 - Hard-to-Reach Code List**

The Hard-to-Reach Code List (HTR) allows the flagging of codes that the system identifies as hard-to-reach. These codes can include a radio talk show telephone number. The flagging of hard-to-reach destination codes is necessary for supervision and control of network traffic. The system flags codes that are hard-to-reach to block traffic from origins that have hard-to-reach destination codes. This condition allows calls that have higher completion rates to use office resources.

The hard-to-reach code list operates with BR0018, STR, and AF0096, Flexible Reroute (FRR). The STR and FRR control traffic to hard-to-reach areas.

### **BR0379 - Selective Dynamic Overload Control**

Selective Dynamic Overload Control (SDOC) is the common channel interoffice signaling number 6 (CCIS6) system version of remote DOC. When the SDOC receives DOC signals from a connecting office, the SDOC automatically applies trunk group controls. The SDOC applies trunk group controls to the CCIS6 trunk group. These controls reduce outgoing traffic to the congested office. Table PREPLANS contains the trunk group controls that the SDOC applies. The SDOC uses table CCSDOC to associate CCIS6 trunk groups with trunk group control entries in table PREPLANS.

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**Network Management - Enhanced** (continued)

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The SDOC can activate automatically or manually. The SDOC automatically activates when the SDOC receives DOC signals. The SDOC manually activates from the AUTOCTRL level of the MAP display.

**BC1128 - Code Control-Equal Access**

Code control-Equal Access allows interexchange carrier codes to determine the application, listing, and removal of code controls. Before this feature, the feature applied, removed, or listed code controls. The country code, area code, or non-area code determined these controls.

**BC1033 - Selective Incoming Load Control**

Selective Incoming Load Control (SILC) creates the SILC control. The SILC reduces incoming traffic from connecting offices that cannot respond to DOC signals. The IDOC activates the SILC controls when the switching system is in the Level 1 or Level 2 machine congestion state. Machine congestion states indicate two levels of switching overload. Level 1 normally indicates less congestion than Level 2. The thresholds that define the machine congestion states used to activate the SILC control appear in table NWMIDOC. Table NWMIDOC defines filters that identify the length of time congestion must exceed a threshold before activation or deactivation of control.

The SILC can control percentages of traffic or use call gapping to reduce switching congestion. Table SILCNWM contains SILC control rates for machine congestion. The control rates are levels 1 and 2. These two levels appear in table NWMIDOC and the trunk group in which to apply SILC control.

*Note:* You can enter any correct trunk group in table SILCNWM. The system applies SILC to single-stage MF trunk groups.

The SILC maintains Equal Access (EA) Access Tandem (AT) offices.

**BC1398 - Reduced SILC Gapping Interval**

The SILC-based call gapping defines a minimum period of time between calls. The system blocks any incoming call attempt or call gap received during this time.

The BC1398 specifies the selective incoming load control gapping rate in tenths of seconds. The range is from 0.0 to 600.0 s.

**AF0081 - SILC Database Robustness**

The AF0081 creates table SILCNWM. This table is the SILC control table. Table SILCNWM specifies each trunk group to which SILC network management controls apply. Table SILCNWM defines a percent level or

## **Network Management - Enhanced** (continued)

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gapping interval for call blocking. Table SILCNWM associates incoming or two-way single-stage MF trunk groups with the threshold values in table NWMIDOC.

Network management can maintain the SILC trunk group controls over all restarts because table SILCNWM defines a SILC trunk group database. The system can dump and restore entries in this database.

### **AF0096 - Flexible Reroute—MMT, OM, and DB**

The Flexible Reroute (FRR) feature improves network management controls. The FRR allows the system to reroute telephone traffic when this action is necessary. Before this feature, the change of routing tables was necessary before reroutes occurred. The AF0096 allows the network manager to reroute traffic without changes to the routing tables. The system can affect traffic control quickly and when needed. The FRR allows network managers to respond to traffic overload and congestion in the network.

*Note:* The FRR feature does not require preprogramming reroutes or Reroute (RRTE) control on the DMS-100 switch to reroute traffic.

### **BC0681 - Automatic Activation/Deactivation of SDOC3CUTOFF**

Feature BC0681 is an improvement of feature BR0379 that automatically activates and deactivates the signal distribution (SD) point SDOC3CUTOFF. Feature BC0681 activates the SD point when a test of the Dead System Alarm (DSA) occurs. The feature activates the SD point when the system operates the DSA related scan (SC) points, ABOAUFail and ABMTMFAIL. The system deactivates the SDOC3CUTOFF when the test of the DSA is over or when the system releases the scan points. Automate the activation and deactivation of the SDOC3CUTOFF SD point to reduce the risk of manual error.

## **Operation**

The following features affect translations of Network Management - Enhanced.

### **BT0251 - Dynamic Overload Control**

This feature creates table network management internal dynamic overload control (NWMIDOC). Table NWMIDOC defines:

- the IDOC level
- threshold values
- the SD group in effect for the office.

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**Network Management - Enhanced** (continued)

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Table NWMIDOC associates IDOC threshold values with SD points in table NWMSD.

**BR0018 - Automatic Out-of-Chain Routing**

This feature creates table network management automatic out-of-chain routing (NWMAOCR). Table NWMAOCR can contain routing information for a maximum of 64 automatic out-of-chain routings. Table NWMAOCR contains the following:

- the AOCR number
- the REROUTE subtable number
- the REROUTE subtable index
- the in-chain route
- the in-chain route overflow percentage threshold
- the alternate route
- the alternate route overflow percentage threshold

**BR0379 - Selective Dynamic Overload Control**

This feature creates table CCSDOC. The CCSDOC associates CCIS6 trunk groups with preplanned controls. Tables NWMPPLN and PREPLANS define these controls. When the system receives a DOC signal for a CCIS6 trunk group, the associated preplanned control in table PREPLANS activates on the trunk group. Table CCSDOC contains three table PREPLANS index values for each trunk group entry. Three table PREPLANS index values are available for each trunk group entry. These values allow each DOC signal level to have an associated preplanned control.

**BR0018 - Selective Trunk Reservation**

The modification of table PREPLANS allows the system to use the entries in this table to activate STR controls automatically. The changes to PREPLANS allow you to activate the STR controls manually from the MAP terminal. The system can activate the controls automatically from table PREPLANS.

**BC1398 - Reduced SILC Gapping Interval**

The SILC gapping values appear in table SILCNWM.

**AF0081 - SILC Database Robustness**

This feature creates table SILCNWM.

**AF0096 - Flexible Reroute—MMT, OM, and DB**

The modification of table PREPLANS allows the system to use the entries in this table to activate FRR controls. With these changes to table PREPLANS,

## **Network Management - Enhanced** (continued)

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you can manually activate the FRR controls from the MAP display. The system can activate the FRR controls automatically from table PREPLANS.

### **Software operation**

The software functionality of features that NTX060BB introduced, appear in the following sections. This section describes the functionality of networks and network management (NWM) to allow a complete understanding of feature package operation. A general summary of network structures appears in the following list.

A heirarchal network contains three parts:

- switching systems
- trunk groups
- traffic load

These parts appear in the following sections.

### **Switching systems**

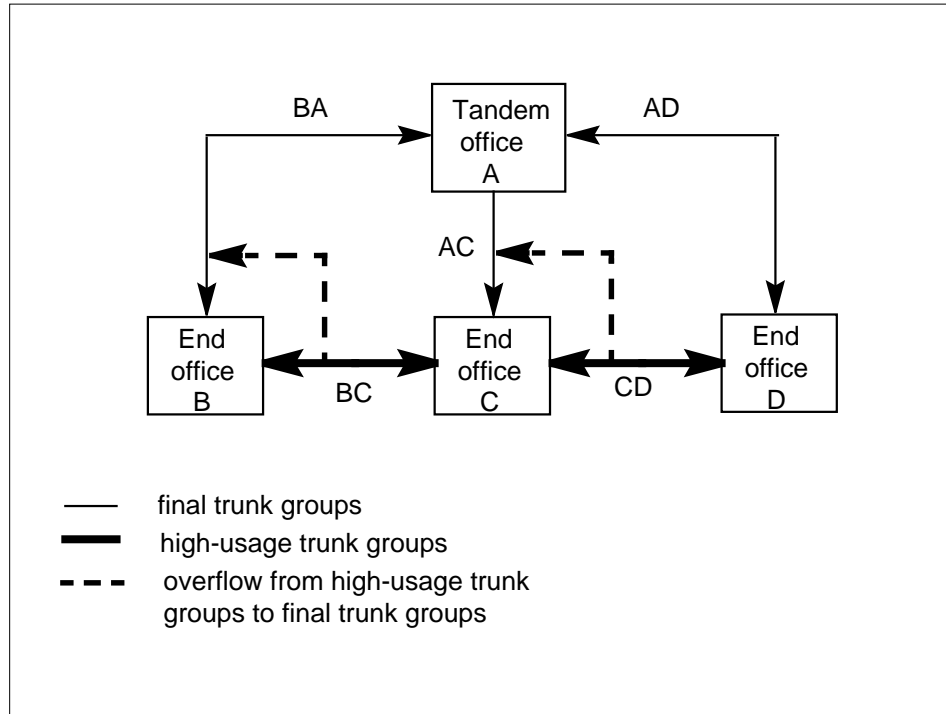
Switching systems in a network rank according to the level of the switching systems in the hierarchy. Two rankings occur. Tandems have the higher ranking. End offices have the lower ranking.

Tandems normally connect to other tandems and to a series of end offices by final trunk groups. End offices can connect to other end offices by high-use trunk groups. This connection allows end offices to route traffic directly to the destination office or to the tandem. An example network configuration appears in the following figure:

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**Network Management - Enhanced** (continued)
 

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**Hierarchical public switched network**

**Note:** See the network trunk group types for additional information.

The system routes traffic through a network in one of the following two methods:

- The originating end office attempts to route a call over a direct trunk group. A direct trunk group connects the originating office to the destination office. Direct trunk groups are not available to carry these calls if the following conditions occur:
  - a direct trunk group to the destination office is not available
  - a direct trunk group does not have the idle capacity to carry the call.
- If a direct trunk group to the destination office is not available, the call routes over a final trunk group. The call routes to a tandem. The call can route over a final trunk group to a tandem if the direct trunk group cannot carry the call. After a call reaches the tandem switch, the tandem switch routes the call to the destination switch over a final trunk group. This trunk group connects the tandem switch to the destination switch.

**Note:** This method offers a cost advantage. The system deploys fewer trunk groups in the network.

## **Network Management - Enhanced** (continued)

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A network can normally use both these methods to route traffic. In the previous figure, the network configuration uses direct trunk groups between some end offices. Final trunk groups are present between the tandem and all of the end offices.

The calls that originate in office B can route to office C over the direct trunk group (BC). The direct trunk group (BC) does not always have the idle capacity to transport the call. When the BC does not have the idle capacity, the call overflows over the final trunk group (BA) to the tandem. The call can route to office C over trunk group AC.

If a call to office D originates at office B, the call must route to the tandem over trunk group AB. This procedure occurs because a direct trunk group is not available from office B to office D. The tandem routes the call to office D over trunk group AD.

### **Network trunk group types**

The system uses trunk groups to transport calls between switching offices. Calls route over trunk groups from one switching system to another until the calls reach the destination offices.

The classification of trunk groups in a hierarchical network is as follows:

- primary high use  
A primary high-usage trunk group is a first choice route. The system offers calls that overflow this trunk group to an intermediate high-use or a final trunk group.
- intermediate high use  
Intermediate high-use trunk groups accept overflow traffic from a primary high-use trunk group or another intermediate high-use trunk group. The system offers calls that overflow intermediate high-use trunk groups to other intermediate high-use trunk groups. The system can offer calls that overflow to a final trunk group.
- final  
A final trunk group accepts overflow calls from a primary high-use or an intermediate high-use trunk group. The system sends calls that overflow this trunk group to treatment.
- direct final  
A direct final trunk group is a first choice route. The system sends calls that overflow this trunk group to treatment.



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## Network Management - Enhanced (continued)

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### In-chain route lists

The location of the switching system in the network configuration determines a switching system routing plan. A switching system routing plan contains a collection of in-chain route lists. In-chain route lists are necessary to route calls to connecting switching systems in the network. An in-chain route list holds a list of trunk groups. These trunk groups are candidates to transport each call to a connecting switching system in the network.

The system uses the following aspects of the call to select an in-chain route list:

- call type
- class-of-service
- origination
- destination

The system stores trunk groups in each in-chain route list according to a specified selection order. The first route in the list takes priority. The system selects this route first to transport a call. The first trunk group can be busy. If this condition occurs, the system offers the call to each of the following trunk groups in the list. If all the trunk groups are busy, the call exhausts the in-chain route list. The system sends the call to treatment.

The first trunk group in each in-chain route list is a direct route. The next trunk groups in each in-chain route list are alternate routes. For example, the routing plan for end office B in the previous figure contains two in-chain route lists. The first in-chain route list is to route calls between end office B and end office C. The second in-chain route list is to route calls between end office B and end office D.

In the following figure, the first in-chain route list contains two trunk groups. The first trunk group is BC. This trunk group is the direct route. This trunk group is first because the trunk group is a direct trunk group. The BC is a primary high-use trunk group. The BC can overflow to an intermediate high-use or a final trunk group. The system must select trunk group BA as a second trunk group. In some conditions, the direct trunk group cannot transport a call, or trunk groups are not available. When these conditions occur, the call can route to the switching system at the next level higher in the network hierarchy. Trunk group BA is a final trunk group. The overflow calls from trunk group BA must go to treatment.

The second in-chain route list for office B in the following figure contains one trunk group. The first trunk group is BA. The system selects the BA when direct trunk groups are not available to transport the call. The call must route to the switching system that is at the next level higher in the network hierarchy.

## **Network Management - Enhanced** (continued)

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This route list does not contain an alternate route because this trunk group is a direct final trunk group.

### **Traffic load**

Anticipated calling patterns determine the engineering of networks. These calling patterns are traffic loads. The traffic load offered to the network exceeds the engineered capacity. This event reduces the ability of the network to transport calls. This event causes congestion in the network.

The system divides traffic load in calls that complete and calls that do not complete. Calls do not complete for the following reasons:

- called party busy
- the called party does not answer the telephone
- facility failure
- busy trunks

Facility failures and busy trunks are two examples of network blocking.

The network management controls functionality reduces traffic load.

### **Network management controls**

Network management (NWM) is the supervision and control of telephone switching networks. The NWM allows for the maximum telephone traffic flow under bad or overload conditions. Bad conditions include periods of equipment failure or damage. Overload conditions occur when the demand for service from the switching office exceeds the ability of the following to provide complete service:

- trunk groups
- common control equipment

The NWM prevents the spread of telephone traffic congestion through the network. To perform this action, the MWM changes or restricts the normal telephone traffic pattern between a switch and the connected offices. A series of NWM controls change these traffic patterns. All NWM controls that NTX060BB introduced are protective or expansive controls.

Protective controls block or cancel telephone traffic that attempts to enter the network. Protective controls make sure traffic does not route over specified trunk groups.

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## Network Management - Enhanced (continued)

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Expansive controls reroute traffic to less loaded offices. These controls change the available routes a call can take. This action increases the possibility that a call reaches the correct destination.

The NWM controls can activate and deactivate automatically or manually. The system activates controls automatically when telephone traffic loads exceed preset thresholds. Network management personnel use thresholds to activate controls manually. Automatically and manually activated controls measure, monitor, and manipulate telephone traffic flow in a network by the following methods:

- prevent the spread of traffic overload conditions
- use all available network circuits
- give priority to traffic types most likely to complete correctly
- give priority to a specified number of calls when all available circuits are in use

The system divides NWM controls in the following classes:

- automatic controls

Automatic controls detect internal overload conditions, alert connecting switches of the congestion, and respond to overload signals incoming from other switches. Automatic controls can activate trunk group controls or route controls when traffic congestion exceeds defined thresholds in the DMS-100 switch.

- trunk group controls

Trunk group controls limit the amount of traffic the system accepts from or offers to specified trunk groups. Trunk group controls can expand the number of available routes for a call.

- code controls

Code controls limit the number of calls to a destination code.

- route controls

Route controls change an internal route list in the DMS-100 switch.

- line load controls

Line load controls prioritize handling of line originations.

## **Network Management - Enhanced** (continued)

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### **Automatic controls**

Automatic controls can perform the following actions:

- detect internal switching congestion
- alert connecting switches of the congestion
- respond to overload signals from other switches

Automatic controls can activate trunk group controls or route controls when traffic congestion exceeds defined thresholds.

The DMS-100 switch supports the following protective automatic controls:

- Internal dynamic overload control (IDOC) detects internal overload conditions. The IDOC alerts connecting offices of the congestion.
- Preplanned control (PPLN) activates trunk group controls to respond to overload signals from connecting offices.
- Selective dynamic overload control (SDOC) responds to overload signals from connecting offices. The SDOC activates trunk group controls on common channel interoffice signaling number 6 (CCIS6) trunk groups.

The DMS-100 switch can use extended automatic control to support automatic out-of-chain routing (AOCR). The DMS-100 reroutes traffic from a specified in-chain final trunk group to a specified alternate trunk group. This condition occurs when the in-chain trunk group overflow rate exceeds a preset threshold.

### **Internal dynamic overload control**

The IDOC is an automatic control that monitors the switching system for overload conditions. The IDOC can signal connecting offices to activate trunk group controls. This action reduces traffic incoming to the congested office.

The IDOC transmits three signal levels, Level 1, Level 2, and Level 3 to indicate different levels of machine congestion. Preset thresholds in table NWMIDOC activate and deactivate IDOC signal levels. Thresholds in table NWMIDOC monitor the following for machine congestion:

- multifrequency (MF) receiver queue length
- central processing unit (CPU) occupancy

The first two signal levels activate when the MF receiver queue length exceeds the preset receiver queue threshold. The first two signal levels are Level 1 and Level 2. Level 1 and Level 2 can activate when CPU occupancy exceeds the preset CPU occupancy activation threshold. Level 1 and Level 2 each have associated thresholds. These thresholds activate the signal level when the number of incoming calls that wait for a receiver exceeds the threshold. These

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**Network Management - Enhanced** (continued)

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thresholds can activate the signal level when CPU occupancy exceeds the threshold. Table NWMIDOC contains the filters for each level. These filters indicate the number of minutes that CPU occupancy must exceed the activation threshold before signaling activates. Level 1 signals normally indicate less congestion than Level 2 signals.

Deactivation thresholds indicate when the system must deactivate Level 1 or Level 2 signaling. The receiver queue length or CPU occupancy can cause signaling to activate. When signaling activates, signaling remains active until congestion falls below the signal level deactivation threshold. The congestion must remain below the deactivation threshold for the number of minutes specified in table NWMIDOC.

The system activates Level 3 signaling when the office loses processing capabilities. You can manually activate Level 3 signaling before a restart. This action allows the system to divert traffic from connected offices.

Entries in table NWMSD assign specified SD points to IDOC. These SD points distribute the IDOC signals. Table NWMIDOC associates IDOC thresholds to SD points in tables NWMSD and subtable NWMSDPT. Table NWMSD appears in the data schema section of this document.

### **Manipulating IDOC**

You can apply or activate the IDOC controls at the auto control (AUTOCTRL) level of the MAP display. When you activate or apply the IDOC control levels, you must select the IDOC level to activate. You can remove the IDOC control levels by the same method as you apply or enable the control levels.

The system sends log NWM130 to the recording device when you enter an IDOC command from the AUTOCTRL level of the MAP display.

The IDOC and selective incoming load control (SILC) controls incoming traffic to reduce machine congestion. The IDOC activates the SILC when offices that connect do not, or cannot, respond to Level 1 or Level 2 signals. To respond to IDOC signals, connecting offices normally implement trunk group controls to reduce traffic to the congested office.

The SILC can use the following two control options to block traffic:

- block percentage of traffic
- block with a gapping interval

The percentage of traffic to block can range from 0 to 100%. If the system uses gapping intervals to block traffic, the rate appears in tenths of second. The range is from 0.0 to 600.0 s.

## **Network Management - Enhanced** (continued)

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The SILC gapping rate blocks all incoming calls that arrive before the gap interval ends. One call can complete during each gapping interval. When the SILC gapping rate blocks calls, the following events occur:

1. The trunk sends a start dial signal (wink) from the peripheral module (PM).
2. Trunk states are set to lockout during a limited time. The received digits are ignored.
3. The trunk sends a 120 IPM tone (fast busy) after the start dial to the originator. This condition indicates that the call cannot complete.
4. The trunk states must receive disconnect from the originator to return to service for normal call processing.

Table SILCNWM defines the SILC control options and the trunk group to which control applies. Table SILCNWM associates incoming or two-way single-stage MF trunk groups with threshold values. Table NWMIDOC defines these values.

The IDOC can automatically apply or remove the SILC. This procedure occurs when a connecting office does not respond to Level 1 or Level 2 signaling. The system can use the threshold values in table NWMIDOC to activate or deactivate IDOC signaling. The system can use these values to activate or deactivate SILC control. The SILC has two control levels. These control levels appear in table SILCNWM. One SILC control level is available for IDOC machine congestion Level 1 and Level 2. These levels appear in table NWMIDOC. Thresholds are not present for Level 3 signaling. Level 3 signals only activate during switching failure. The SILC Level 2 controls take priority over Level 1 controls.

### **Preplanned control**

Preplanned control (PPLN) is an automatic control. This control responds to IDOC signals received from a connecting office. The IDOC signals transmit to alert connecting offices when the system detects machine congestion. The PPLN control activates trunk group controls to respond to congestion signals. This action reduces outgoing traffic to the congested office.

The system uses scan points to detect external IDOC signals and to activate trunk group controls. Table PREPLANS defines these controls. The system uses tables NWMSC and NWMSCPT to associate scan points with trunk group control entries in table PREPLANS. When the system automatically activates a preplanned control, you can deactivate the control manually at any time.

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## Network Management - Enhanced (continued)

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You can use the AUTOCTRL level of the MAP terminal to activate the PPLN manually. When you activate a PPLN, you must specify the index to table PREPLANS. This index allows the preplanned control indexed in table PREPLANS to activate. You can deactivate the PPLNs at the AUTOCTRL level of the MAP display.

The system sends log report NWM130 to the recording device. This event occurs when you enter a PPLN command from the AUTOCTRL level of the MAP display.

### Selective dynamic overload control

Selective dynamic overload control (SDOC) is the CCIS6 system version of PPLN. The PPLN is an automatic control that activates trunk group controls. Trunk group controls reduce outgoing traffic to a congested office that transmits IDOC signals. To respond to IDOC signals that a congested office transmits, the SDOC implements trunk group controls on CCIS6 trunk groups.

### Common channel interoffice signaling no 6 (CCIS6)

The CCS involves the separation of voice and signaling between switching offices. Voice trunks transport voice between offices. Signaling links carry digits and supervisory signals between offices. The data on the signaling link has a separate path. The separate path allows data to contain information that is not digits. The data can include supervisory signals without a loss of call processing capacity.

The CCIS6 allows a switching office to handle POTS or basic service calls with CCS.

### Manipulating SDOC

The system can receive remote IDOC signals to automatically activate the SDOC. You can use the AUTOCTRL level of the MAP display to manually activate SDOC.

The SDOC uses entries in table PREPLANS to automatically activate trunk group controls. The SDOC activates trunk group controls when the SDOC receives IDOC signals from a congested office. Table CCSDOC associates CCIS6 trunk groups with preplanned trunk group controls in table PREPLANS. Three table PREPLANS entries are available for each CCIS6 trunk group. These entries allow trunk group controls to activate for the three IDOC signal levels that the system can receive.

You can manually apply SDOC levels at the AUTOCTRL level of the MAP display. You can manually activate more than one SDOC control on a trunk group. The effect of multiple active SDOC levels depends on on the trunk

## **Network Management - Enhanced** (continued)

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group controls that table PREPLANS activates. You can remove or disable the SDOC by the same method as you apply or enable the SDOC.

The system sends log report NWM130 to the recording device. This event occurs when you use the AUTOCTRL level of the MAP display to apply or remove the SDOC.

### **Automatic out-of-chain routing**

Automatic out-of-chain routing (AOCR) is an automatic control that allows extended routing of calls that overflow the in-chain final trunk groups. Without AOCR, treatment normally receives calls that overflow in-chain final trunk groups.

### **AOCR control parts**

The AOCR controls involve the following parts:

- in-chain final trunk groups
- alternate routes

An in-chain final trunk group is the last entry in an in-chain route list of a call. An in-chain route list holds a list of trunk groups. These trunk groups are candidates to transport each call to a connecting switching system in the network. The first trunk group in the in-chain route list is always the first candidate to transport a call. The first trunk group can be busy. If this condition occurs, the AOCR offers the call to each of the following trunk groups in the list. The call can exhaust the routing options available in the in-chain route list when the AOCR is not active. If this condition occurs, the system sends the call to treatment.

The alternate route is the specified trunk group over which AOCR attempts to route traffic that overflows the in-chain final trunk group.

### **Manipulating AOCR controls**

The AOCR can automatically activate reroute controls. Tables REROUTE and NWMRROUT define these reroute controls. Table NWMAOCR associates the in-chain trunk group, the alternate route, and threshold values with reroute controls. Tables REROUTE and NWMRROUT define these reroute controls.

The AOCR activates reroute controls when the rate of traffic that overflows the in-chain route exceeds a preset threshold (ACTPCT). Table NWMAOCR defines the ACTPCT. Before reroute controls can activate, the traffic overflow rate for the alternate route cannot exceed a second preset threshold (OVFLPCT). Table NWMAOCR defines the OVFLPCT.



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**Network Management - Enhanced** (continued)

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The AOCR removes reroute controls when the overflow rate of the alternate route exceeds the alternate route overflow threshold (OVFLPCT). The AOCR removes reroute controls. This action occurs when the overflow rate of the in-chain route is equal to or less than the in-chain overflow threshold (ACTPCT).

At intervals of 5 min, the AOCR activates or deactivates reroute controls on an in-chain final trunk group.

Before you activate AOCR controls, you must enter data in tables REROUTE and NWMRROUT. This data defines reroute controls that the AOCR activates. You must enter data in table NWMAOCR to define the following:

- the AOCR number
- threshold values
- an in-chain final trunk group that the system must control
- an alternate route
- indexes to use with tables REROUTE and NWMRROUT

You can manually apply AOCR controls from the AUTOCTRL level of the MAP display.

When you apply or enable AOCR controls, you must specify the AOCR number. Use the the AOCR number as an index to table NWMAOCR. The trunk groups and threshold values appear in this table. You can remove or disable the AOCR controls by the same method as you apply or enable the controls.

The system sends log report NWM130 to the recording device. This event occurs when you enter an AOCR command at the AUTOCTRL level of the MAP display.

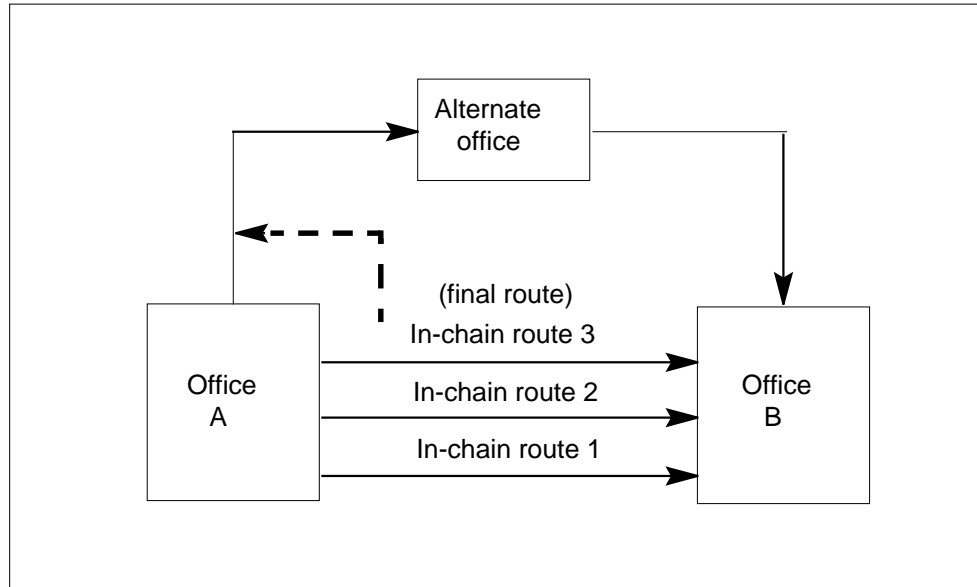
The AOCR takes priority over all other automatic controls. If an automatic control is on a trunk group, AOCR overrides the previous control. Trunk group controls and code controls take priority over the AOCR control. If trunk group or code controls are present on a trunk group, the system does not apply AOCR controls.

An example of a network for which the system applies AOCR to the in-chain route three appears in the following figure. This route is the final route in the in-chain route list.

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**Network Management - Enhanced** (continued)
 

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**Automatic out-of-chain routing example**

In the previous figure, if a call originates in office A and is for office B, the system assigns the call to the in-chain route list. The in-chain route list contains the three routes that appear.

In-chain route one is the first candidate to transport the call. If route one does not have idle capacity to transport the call, the system offers the call to in-chain route two. If route two cannot to transport the call, the system offers the call to the final route.

When the call reaches the final route, the system can accept or reject the call. If the system accepts the call, the system sends the call to office B by in-chain route three. If the system rejects the call, and AOCR did not activate reroute controls, the system sends the call to treatment. If AOCR activates reroute controls, the call reroutes over the alternate route to the alternate office. The alternate office routes the call to office B.

The AOCR activates or deactivates reroute controls at intervals of 5 min. When reroute controls are active, the control remains active for 5 min. On the next 5 min check, the AOCR can allow the reroute control to remain active. The AOCR can deactivate the control. The overflow rate of the alternate route must not exceed the threshold (OVFLPCT) to allow the AOCR to activate reroute controls. The threshold appears in table NWMAOCR. The AOCR activates the reroute controls when the overflow rate of the final in-chain route exceeds the threshold (ACTPCT). The threshold appears in table NWMAOCR. The system deactivates the reroute controls when the overflow

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## Network Management - Enhanced (continued)

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rate of the alternate route exceeds the threshold (OVFLPCT). The system can deactivate the reroute controls. This procedure occurs when the overflow rate of the in-chain route is equal or less than the threshold (ACTPCT).

### Trunk group controls

The NWM trunk group controls restrict the amount of traffic accepted from or offered to specified trunk groups. These controls change the available routes a call can take. This ability increases the possibility that a call reaches the correct destination when congestion occurs in the network.

You can activate trunk group controls manually from the GRPCTRL level of the MAP display. Automatic controls and scan points can use trunk group control entries in table PREPLANS to activate trunk group controls.

The DMS-100 switch supports the following protective trunk group controls:

- Directional reservation control (DRE) prioritizes incoming calls on a controlled trunk group.
- Protective reservation equipment (PRE) prioritizes direct-routed calls that the system offers to a controlled trunk group.
- Cancel-to (CANT) blocks calls that access a controlled trunk group.
- Skip (SKIP) makes sure the system cannot offer calls to a controlled trunk group. This procedure causes the calls to advance to the next trunk group in a route list.
- Cancel-from (CANF) blocks calls that overflow a controlled trunk group.
- Incoming trunk busy (ITB) restricts the amount of incoming calls on a controlled trunk group. To accomplish this control, remove from service a percentage of the trunks in a trunk group.
- Selective trunk reservation (STR) blocks outgoing calls when the number of idle trunks in a trunk group falls below a defined threshold.

The DMS-100 switch supports the following extended trunk group control:

- Flexible reroute (FRR). FRR allows the immediate rerouting of calls from an in-chain route to a VIA route. This procedure occurs when congestion occurs in the in-chain route, or when this route fails.

The NTX060BB creates selective trunk reservation (STR) and flexible reroute (FRR). The functionalities of STR and FRR appear in the following sections.

### Selective trunk reservation control

The STR is a protective trunk group control that is an extension to DRE and PRE. The STR includes HTR codes. The STR monitors an outgoing trunk

## Network Management - Enhanced (continued)

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group. The STR blocks traffic to control the level of idle trunks in the trunk group. The STR uses threshold values to monitor and control the number of idle trunks in a trunk group.

You can apply or remove the STR from a trunk group at the GRPCTRL level of the MAP display. You can use CI MASSCALL commands.

The STR controls percentages of the following four types of traffic:

- direct-routed traffic  
Direct-routed traffic contains calls that the first route transports in an in-chain route list of the call.
- alternate-routed traffic  
Alternate-routed traffic contains calls that a route transports other than the first route in the in-chain route list of the call.
- hard-to-reach direct-routed traffic  
Hard-to-reach direct-routed traffic contains calls with destination codes that the system flags as hard-to-reach. The first route in the in-chain route list transports these calls.
- hard-to-reach alternate-routed traffic  
Hard-to-reach alternate-routed traffic contains calls with destination codes that the system flags as hard-to-reach. A route, other than the first route in the in-chain route list, transports these calls.

The STR uses two thresholds to activate and deactivate control on an outgoing trunk group. The two thresholds are Lev 1 and Lev 2. These thresholds define two idle trunk levels for a trunk group. Each threshold has a traffic control percent rate. The number of idle trunks in the controlled trunk group can fall between the Lev 1 and Lev 2 threshold values. This event causes the Lev 1 controls to activate. The number of idle trunks in the controlled trunk group can continue to fall after Lev 1 controls activate. This event causes the controls for the Lev 2 threshold to activate. The number of idle trunks can exceed the Lev 2 threshold. This event causes the controls for the Lev 2 threshold to activate. The level of idle trunks in the controlled trunk group can fall below or rise above the defined threshold values. This event causes the STR to apply or remove control.

- Lev 1 controls block only HTR direct-routed and HTR alternate-routed traffic. You must specify the percent of traffic blocked when you apply STR control. You can apply STR control at the GRPCTRL level of the

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## Network Management - Enhanced (continued)

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MAP display. You can use the CI MASSCALL commands to apply STR control.

- Lev 2 controls block direct-routed, alternate-routed, HTR direct-routed, and HTR alternate-routed traffic. The percentage of direct-routed traffic controlled is equal to the percentage that you specify when you apply STR control. You can apply STR control at the GRPCTRL level of the MAP display. You can use the CI MASSCALL commands to apply STR control. Lev 2 controls block standard percentages of other traffic. Lev 2 controls block 100% of alternate-routed traffic, 75% of HTR direct-routed, and 100% of HTR alternate-routed traffic.

The types and amounts of traffic that STR Lev 1 and Lev 2 controls appear in the following table.

### Percent of traffic blocked for STR and HTR levels

Level	Direct		Alternate	
	Non-HTR (effect of STR only)	HTR (effect of STR & HTR)	Non-HTR (effect of STR only)	HTR (effect of STR & HTR)
1	N.A.	X%	N.A.	X%
2	X%	75%	100%	100%

**Note 1:** N.A. = Not applicable

**Note 2:** X = 0-100% For the percentage that you manually specify by the parameters of the APPLY STR command.

You can apply STR control manually at the GRPCTRL level of the MAP display. You can use CI MASSCALL commands. The CI MASSCALL commands allow you to apply STR without access to the GRPCTRL level of the MAP display. You can remove the STR controls by the same method as you apply the STR controls.

The system sends log NWM106 to the recording device when an STR control activates or deactivates.

### Flexible reroute control

The flexible reroute (FRR) feature improves network management controls. The FRR dynamically reroutes telephone traffic when this action is necessary. Before the FRR, the change of routing tables was necessary before reroutes occurred. The AF0096 allows the network manager to reroute traffic without

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## Network Management - Enhanced (continued)

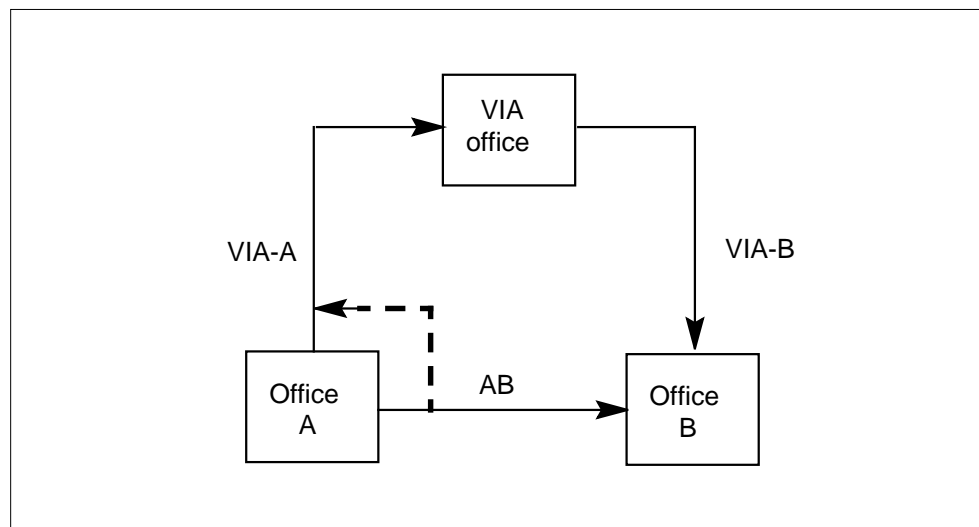
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modification to the data tables. The FRR allows network managers to respond to traffic overload and congestion in the network.

The FRR feature is an extended NWM trunk group control for use in the public-switched telephone network. The FRR reroutes calls from an in-chain (FROM trunk group) route to a VIA route (TO trunk group). This procedure occurs when the in-chain route overloads or fails.

An FRR control involves two trunk groups. The first trunk group is the in-chain route. This group is the trunk group in which the system applies FRR control. This trunk group is the controlled FROM trunk group. The system offers calls that cannot carry over this trunk group to the second trunk group, the VIA route. The calls offered to the VIA route are rerouted calls. This relationship appears in the following figure.

### Flexible reroute control example



The system can apply an FRR control to trunk group AB, the in-chain route. If the in-chain route cannot transport the calls from office A to office B over the in-chain route, the system offers the calls to a VIA route. This VIA route is the VIA-A. The VIA-A route transports the calls to the VIA office. The VIA office routes the calls over VIA-B. The VIA-B transports the calls to office B.

The FRR controls have the following parts:

- in-chain routes
- VIA routes
- control options

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## Network Management - Enhanced (continued)

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### In-chain routes

In-chain routes are trunk groups that carry calls according to rules for routing. These trunk groups carry calls in a hierarchical network. When you enter data for a switch, the system creates the in-chain route lists.

### VIA routes

The VIA routes are trunk groups that transport rerouted calls. These trunk groups ignore the network routing rules for the hierarchical network. Calls that access VIA routes are alternate-routed calls. The system creates VIA route lists when an FRR control applies to a trunk group. The DMS-100 switch supports the following VIA route list types:

- the route list types that hold one VIA route
- the route list types that hold a maximum of seven VIA routes

The DMS-100 switch supports a maximum of 255 VIA route lists. Each VIA route list holds one VIA route. One VIA route list is available for each FRR control. Sixteen of these 255 VIA route lists can hold a maximum of 7 VIA routes.

Rerouted calls advance through VIA route lists that hold more than one VIA route. The route advance pattern that the rerouted call follows is the ordered hunt method. The ordered hunt method distributes rerouted calls in all routes in the VIA route lists. This method requires the system to offer a specified rerouted call in sequence to each route in a VIA route list. The system continues this procedure until a route can carry the rerouted call, or until the system attempts each route.

When the system locates a route to carry the call, the system offers the next rerouted call to the next route in the VIA route list. When a rerouted call exhausts the VIA route list, the call returns to a route in the in-chain route list. The in-chain route list of the call contains two possible routes. The selection of the immediate reroute (IRR) or the regular reroute (RRR) option determines the route to which the call returns. This selection occurs when the system applies the FRR control. If the system selects the immediate reroute (IRR) option, the rerouted call returns to the in-chain route. The in-chain route is the controlled trunk group. If the system selects the regular reroute (RRR) option, the rerouted call returns to the in-chain route. This route follows the controlled trunk group.

## **Network Management - Enhanced** (continued)

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### **FRR control options**

The FRR control options serve the following functions:

- control if the system offer calls to a VIA route list after the system applies an FRR control to the calls
- control if rerouted calls return to the in-chain route lists if the calls exhaust the VIA route lists

A call can advance through an in-chain route list and encounter a trunk group that has an FRR control applied. If this event occurs, the system must reroute the call. The options described in the following sections can cause the FRR controls to reroute to a VIA route.

#### **Immediate reroute**

Option Immediate reroute (IRR) allows calls that attempt to access the controlled trunk group to reroute. The IRR option causes the FRR control to operate like a pre-hunt trunk group control.

#### **Regular reroute**

Option Regular reroute (RRR) allows calls that overflow the controlled trunk group to reroute. The RRR option causes the FRR control to operate like a post-hunt trunk group control.

#### **Direct route (DR)**

Option Direct route (DR) allows the system to reroute a percentage of direct-routed calls when the calls encounter an FRR control. The percentage ranges between 0 and 100 percent, in increases of 1 percent.

#### **Alternate route (AR)**

Option Alternate route (AR) allows the system to reroute a percent of alternate-routed calls when the calls encounter an FRR control. The percentage ranges between 0 and 100 percent, in increases of 1 percent.

#### **Hard-to-reach (HTR)**

The DMS-100 switch maintains a list of destination codes that the system signals as hard-to-reach. The Hard-to-reach (HTR) option allows calls that encounter an FRR control to reroute if the destination code is in the HTR list. The HTR destination code list can specify destination codes of calls that the system reroutes. If all non-equal access (EA) calls, except 911 traffic, must reroute from a shared trunk group, the switch can place in the HTR list the destination codes of non-equal access codes to reroute. The HTR list does not include the 911 destination code. If you activate the FRR control to reroute non-equal access calls (NEA) and the HTR option is selected, the system reroutes all non-equal access calls from the shared trunk group. This procedure does not occur for 911 calls.



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**Network Management - Enhanced** (continued)

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**Equal Access**

The Equal access (EA) option makes sure the system reroutes only EA non-TOPS calls that encounter an FRR control. These calls include the following types:

- feature group B calls
- feature group C calls
- feature group D calls

The DMS-100 switch classifies the following calls as EA non-TOPS calls:

- intra-LATA calls for which the system selects a carrier. The user must dial the 10XXX prefix.
- inter-LATA calls, with the following exceptions:
  - privileged inter-LATA calls in which the user does not dial a carrier prefix
  - corridor inter-LATA calls that a Bell operating company carries

**Non-equal access (NEA)**

The NEA allows only NEA non-TOPS calls that encounter an FRR control to reroute. Examples of NEA calls follow:

- 911 traffic
- local traffic
- intralocal traffic

**Cancel in-chain return (CICR)**

The CICR allows the system to send rerouted calls to treatment if the rerouted calls exhaust the VIA route list. The system does not return the calls to the in-chain route list. The no circuit class of the last trunk group that the rerouted call overflowed determines treatment.

A rerouted call can advance through the VIA route list. The call can encounter a controlled FROM trunk group on which the system applies an FRR control. When these conditions occur, the FRR control does not affect the call. If a rerouted call encounters trunk group controls, the controls affect the call. The trunk group controls include DRE, PRE, CANT, SKIP, STR, and CANF.

## Network Management - Enhanced (continued)

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### Manipulating FRR controls

You can apply the FRR controls manually to the trunk groups. The system can apply the controls automatically to trunk groups. You can use the following two methods to apply the FRR controls manually:

- Enter the FRR commands at the GRPCTRL menu of the MAP display.
- Enter the preplan commands at the AUTOCTRL menu of the MAP display.

When scan points activate a preplan, the system applies FRR controls automatically. The controls must be in the preplan.

A control you apply manually replaces any control that you or the system applied to the trunk group.

A manual and an automatic application of FRR control to a trunk group can occur at the same time. If this condition occurs, the automatic application cannot replace the manual application.

The removal of FRR controls is the same as the application of the FRR controls. You can remove FRR controls manually. If you applied an FRR control manually to a trunk group, you must remove the FRR control manually. If the system applied an FRR control to a trunk group, removal of the FRR control is manual or automatic.

The threshold setting of an office parameter depends on the maximum number of trunk groups the FRR controls can control at the same time. The office parameter is NUM\_NWM\_ENGR\_TRKGRP\_CTRL. This parameter appears in table OFCENG. This parameter has a range of 0 to 255, in increases of 1.

The system sends log report NWM107 to a device that records. This event occurs each time the system applies an FRR control to, or removes an FRR control from a trunk group.

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**Network Management - Enhanced** (continued)

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**Flexible reroutes and reroute control**

The FRR control does not replace the reroute (RRTE) control. The following table summarizes important differences between the FRR control and the RRTE control.

**Comparison of FRR and RRTE controls**

<b>FRR control</b>	<b>RRTE control</b>
Trunk group control	Route list control
Set up and activation of this control is immediate in response to network congestion	You must planned the application of this control in advance and anticipate congestion
Use the GRPCTRL level of the MAP display to activate manually	You cannot activate manually
Enter data in table PREPLANS to activate this control automatically	Activates automatically when you enter data in table NWMAOCR
The use of standard digit outpulsing occurs for intra-LATA, non-TOPS type calls. The outpulsing for the in-chain route determines outpulsing for other types of calls. These calls can include international, FGA, FGB, FGC, FGD, and TOPS calls	Standard or non-standard digit outpulsing occurs
Can return back to the in-chain list	Cannot return to the in-chain list

**FRR option example - single VIA route**

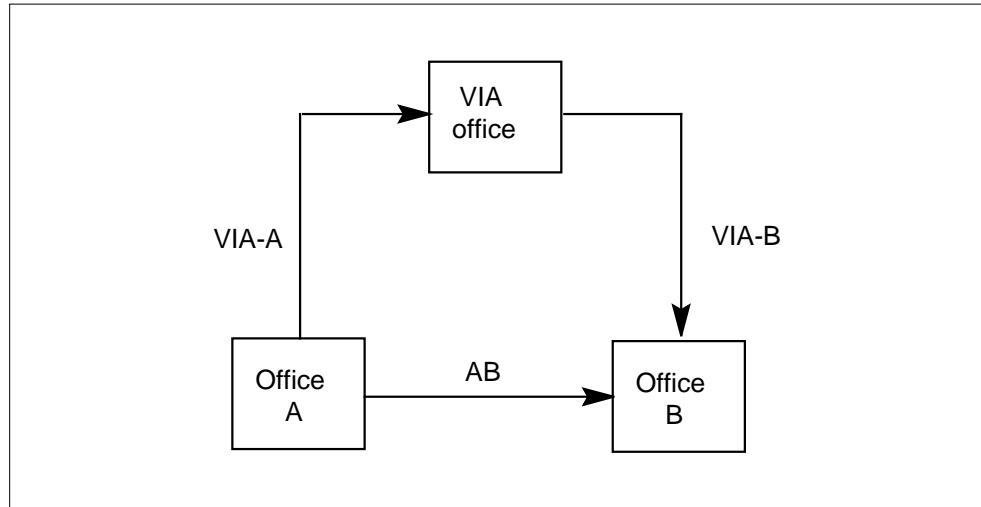
An example of an FRR control that operates appears in the following figure. The origination office A and destination office B connect by trunk group AB. If trunk group AB cannot transport all the calls offered, the system sends the overflow calls to treatment.

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## Network Management - Enhanced (continued)

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### Flexible reroutes and reroute control



The system can choose to reroute the calls over a VIA route where call-carrying capacity is available. Another route that connects office A to office B by a VIA office appears in the preceding figure. To form this route, the system requires two trunk groups. The first trunk group, VIA-A, connects office A to the VIA office. The second trunk group, VIA-B, connects the VIA office to office B.

To reroute calls that overflow trunk group AB, the system applies an FRR control to trunk group AB. Options for this FRR control example are:

- regular reroute
- 100 percent of direct-routed calls
- 100 percent of alternate-routed calls
- VIA route VIA-A
- cancel in-chain return

The calls that overflow the controlled trunk group are offered to VIA-A. The system sends calls that VIA-A cannot transport to treatment.

### FRR option example - multiple VIA routes

An example FRR with multiple VIA routes appears in the following figure. Trunk group VIA-A transports calls that the system did not reroute. The VIA-A transports rerouted calls. Rerouted calls offered to VIA-A can exceed the capacity of this trunk group. The trunk group cannot transport all calls that access the trunk group. To solve this problem, FRR controls can offer rerouted calls to VIA route lists. Each route list contains a maximum of seven VIA

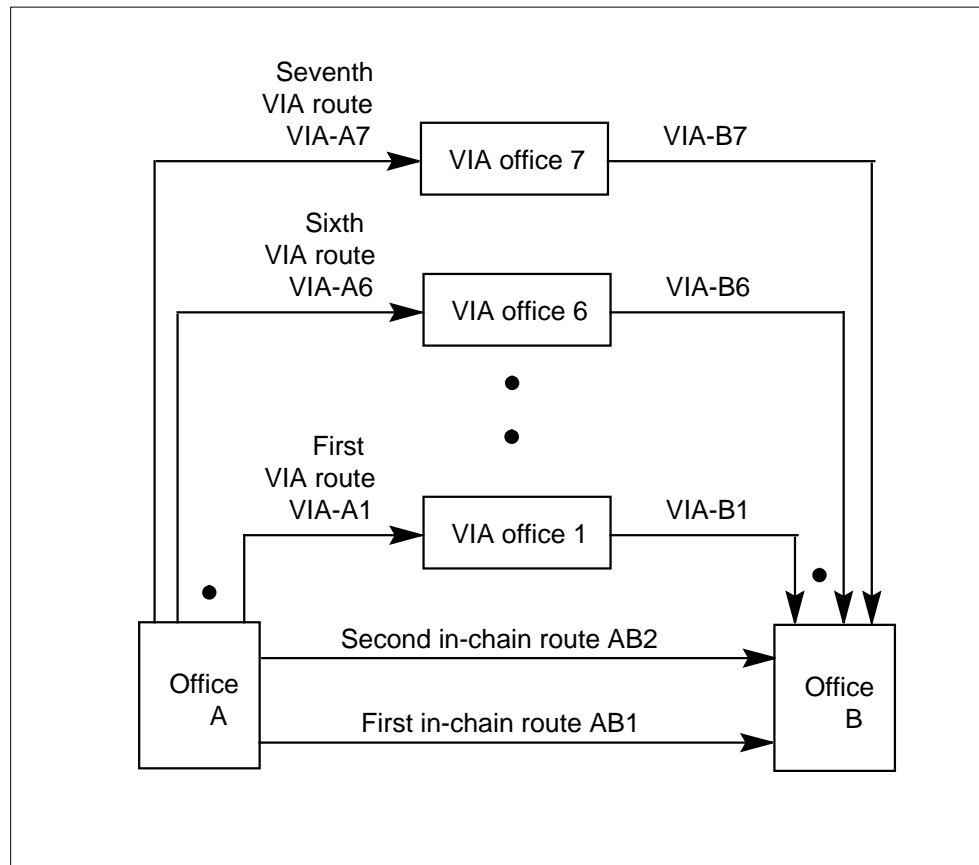
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**Network Management - Enhanced** (continued)
 

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routes. When rerouted calls advance through these VIA route lists, rerouted calls follow the ordered hunt method. The following figure illustrates this plan. If the AB1 has an FRR control applied, the selection of control options is as follows:

- regular reroute (RRR)
- 100 percent of direct-routed calls
- 100 percent of alternate-routed calls
- VIA routes: VIA-A1, VIA-A2, VIA-A3, VIA-A4, VIA-A5, VIA-A6, and VIA-A7

**The FRR and multiple VIA routes example**


The system offers the first call that the in-chain route cannot transport, to the VIA route VIA-A1. This first call is trunk group AB1. If the rerouted call overflows VIA-A1, the system offers the rerouted call to VIA-A2. VIA-A2 contains an idle trunk. The system offers the second rerouted call that overflows trunk group AB1 to VIA-A3. If idle trunks in VIA-A3 are not

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## Network Management - Enhanced (continued)

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available, the system offers the call to VIA-A4. The second rerouted call advances through the VIA route list in the following order:

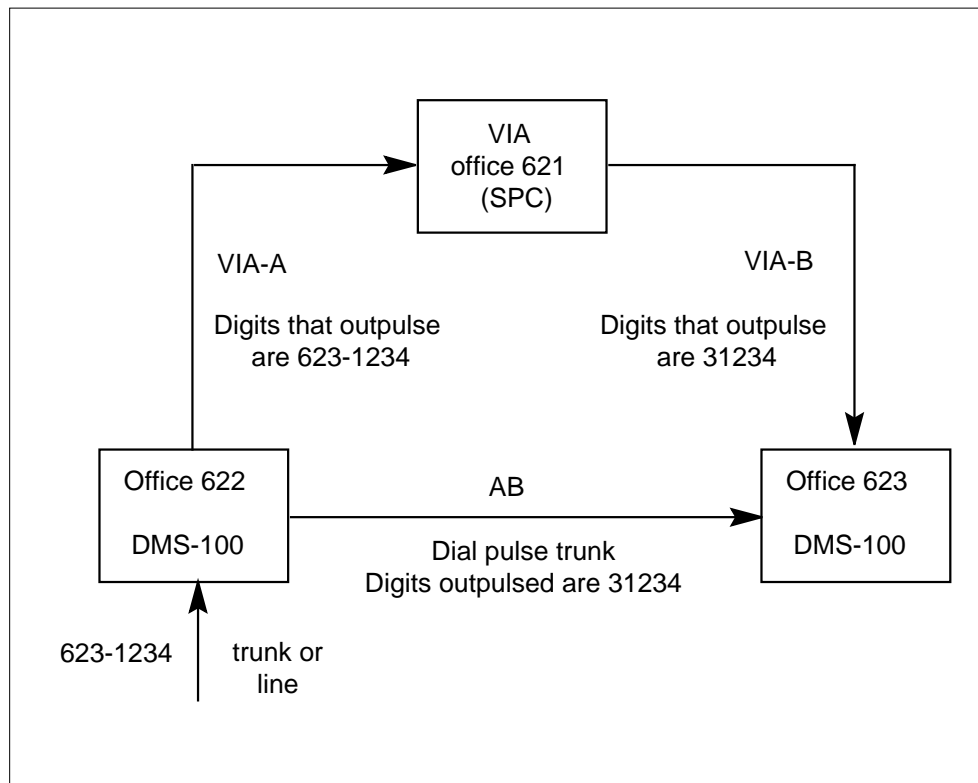
1. VIA-A3
2. VIA-A4
3. VIA-A5
4. VIA-A6
5. VIA-A7
6. VIA-A1
7. VIA-A2

If the rerouted call exhausts the VIA route list, the call returns to the next in-chain route, trunk group CLLIAB2.

### FRR outpulsing example

The following figure illustrates outpulsing.

#### FRR outpulsing example



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**Network Management - Enhanced** (continued)

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In this network example, the system applies an FRR control to trunk group AB. The system selects the following options:

- an RRR
- 100 percent direct-routed calls
- 100 percent alternate-routed calls
- a VIA route VIA-A
- cancel in-chain return

When office 622 receives a call with an office 623 destination code, outpulsing occurs as follows:

1. Office 622 collects a seven-digit destination code from the incoming trunk group.
2. The call is for office 623, a step-by-step switch.
3. The system offers the call to the direct trunk group, trunk group AB.
4. If this trunk group transports the call, the digits 31234 are outpulsed.
5. If this trunk group cannot transport the call, the system offers the call to the VIA-A route.
6. If the VIA-A route carries the call, seven digits, 6231234 are outpulsed over this route.
7. If the call reaches the VIA office, this office selects the VIA-B route to carry the call to office 623.
8. If the VIA-B route has spare call-carrying capacity, the VIA office outpulses 31234 over the VIA-B route.

**Multiple trunk group controls and sequencing**

Two types of trunk group controls are available. These controls are the pre-hunt trunk group controls and the post-hunt trunk group controls. Pre-hunt trunk group controls affect calls before the calls attempt to access controlled trunk groups. Post-hunt trunk group controls affect calls after the calls overflow the controlled trunk group.

## Network Management - Enhanced (continued)

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A call can encounter a controlled trunk group that has more than one trunk group control. The trunk group controls are addressed in the following order in the DMS-100 switch:

- pre-hunt trunk group controls:
  - flexible reroute (FRR) - immediate reroute (IRR)
  - directional reservation equipment (DRE)
  - protective reservation equipment (PRE)
  - cancel to (CANT)
  - skip (SKIP)
  - selective trunk reservation (STR)
- post-hunt trunk group controls
  - an FRR - regular reroute (RRR)
  - cancel from (CANF)

A call can access a trunk group with a DRE, PRE, or SKIP trunk group control. If one of these controls affects the call, the following controls can affect the call:

- an FRR control. The system applies this control to the trunk group.
- a CANF control. This control applies to the call if the system applies the control to the trunk group.

### Code controls

Code controls restrict the number of calls that occur to a specified destination code.

The DMS-100 switch supports the following protective code controls:

- Code blocking (CBK) restricts makes sure a percentage or rate of traffic cannot enter the network based on destination code.
- Pre-route peg (PRP) maintains counts for traffic studies. These traffic studies determine the requirement for code controls.
- Hard-to-reach flag (HTRF) is a code control that flags codes as hard to reach (HTR). The switch can block traffic with destination codes flagged as HTR. This procedure allows calls that have a greater chance of completion to use office resources.

The NTX060BB creates the HTRF request. The functionality of HTRF appears in the following section.



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**Network Management - Enhanced** (continued)

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**Hard-to-reach flag**

The HTRF request allows the system to flag codes as HTR. An HTR code is a destination code in which high rates of traffic from a specified area cannot complete. An example of this condition is a radio talk show number. The HTR codes operate with specified trunk group controls. The HTR codes control traffic from a specified origin to a code flagged as HTR. This procedure allows traffic with higher completion rates to use office resources that that calls that can never complete use.

**Manipulating HTR flags**

You can manually activate the HTRF request from the CODECTRL level of the MAP display. The system can flag codes as HTR based on the following codes:

- country code
- area code
- non-area code
- interexchange carrier code

You must specify the SNPA from which originating calls arrive or the serving translation design. You must specify this data for area code and non-area code types. You must specify this information when you flag a code as HTR.

The system sends log report NWM112 to the recording device each time the system adds or removes an HTRF from a code.

**Summary**

The NWM features and controls are as follows:

- auto control (AutoCtrl)
  - IDOC - internal dynamic overload controls
  - PPLN - preplanned number control
  - AOOCR - automatic out-of-chain reroute
  - SDOC - selective dynamic overload control
  - SILC - selective incoming load control
- group control (GrpCtrl)
  - DRE - directional reservation equipment
  - PRE - protection reservation equipment
  - CanT - cancel to
  - CanF - cancel from

## Network Management - Enhanced (continued)

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- SKIP - skip control
- ITB - incoming trunk busy
- STR - selective trunk reservation
- SILC - selective incoming load control
- TASI - time assigned speech interpolation (DMS-300 switch)
- code control (CodeCtrl)
  - CBK - code blocking

*Note:* The system applies Mass Calling if the software contains this parameter. The system applies Mass Calling when you enter this parameter at the code control level.

- PRP - preroute peg count
- HTRP - hard-to-reach peg count (DMS-300 switch)
- RADR - receiver attachment delay recorder
- HTRF - hard-to-reach flag

*Note:* The system applies Mass Calling if the hardware contains this parameter. The system applies Mass Calling when you enter this parameter at the code control level.

- reroute control (RteCtrl)
  - RRTE - reroute control
- international code control (IntCCtrl)
  - CBK - code blocking
  - PRP - preroute peg count
  - HTRP - hard-to-reach peg count (DMS-300 switch)

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**Network Management - Enhanced** (continued)

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Brief notes about the controls are as follows:

- NM controls
  - the application of NM controls increase in 1% increments. The range is 1-100%.
  - The system can activate preplans on 256 trunk groups.
  - The system can activate code blocks of 1 to 18 digits on 256 codes. The sum of CBK, PRP and HTRF = 256. A block is a percentage of traffic or a gap in seconds.
  - The system can activate an AOCC on 64 trunk groups.
  - If machine stoppage causes a DMS switch to fail, the system deactivates all NM controls.
- IDOC
  - An IDOC reduces the traffic load the system offers to the office. An IDOC requests selected connecting offices to control or restrict routing.
  - The system automatically generates and transmits an IDOC in response to overloads that the system detects internally.
  - The system can generate and transmit 3 levels of IDOC. The system can apply or deactivate levels 1, 2, and 3 automatically. You can apply or deactivate these levels manually.
  - The automatic decision to apply or remove IDOC control occurs at intervals of 60 s.
  - The system generates IDOC-1. This event occurs when the number of incoming MF calls that wait for a receiver exceeds the threshold value. This value is the level 1 threshold value for time set in table NWMIDOC.
  - The system releases IDOC-1 if the IDOC-1 falls below the value set for off-threshold in table NWMIDOC.
  - The system generates IDOC-2 if the percent of time the CPU devotes to call processing is greater than the IDOC-1 threshold.
  - The system deactivates IDOC-2 when call processing use is less than the IDOC-1 off-threshold value.
  - The system automatically activates IDOC-3. This event occurs if the office loses call processing ability when the restart initialization is complete. Call processing ability includes the ability to perform warm or cold restarts.

## Network Management - Enhanced (continued)

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- The system automatically deactivates IDOC-3.
- You can apply an IDOC-3 manually.
- AOCR
  - The AOCR provides out-of-chain routing for calls that overflow the in-chain final route.
  - The percentage overflow on a final route can exceed one threshold. This event can occur when the percentage overflow on the VIA route does not exceed another threshold. If this event occurs, the system automatically activates AOCR.
  - The system can activate a maximum of 64 AOCRs.
  - An AOCR does not apply if any other type of NWM control is active on the trunk group.
  - An AOCR overrides any other active auto control.
- PPLN
  - Another name for the PPLN was the remote DOC.
  - The PPLN uses an external DOC signal to automatically activate pre-planned trunk group controls. You can use the NWM to manually activate the PPLN.
  - You can activate a maximum of 256 preplan numbers. Each preplan number contains a maximum of 32 trunk groups.
- SDOC
  - A CCIS DOC signal automatically activates the SDOC. You can use the NWM to manually activate the SDOC.
  - You can manually activate many SDOC controls on a trunk group.
  - When the SDOC receives a CCIS DOC signal, the system deactivates all other SDOC levels. The system applies the correct SDOC.
  - The following interactions occur between SDOC levels:
    - The DOC 0 overrides all other SDOC levels. Traffic restrictions do not occur.
    - Reception of IGDOC disables DOC 1 and 2 and deactivates DOC 3.
    - Reception of ENDOC activates DOC 1 and 2. The ENDOC can activate controls you disable manually.

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**Network Management - Enhanced** (continued)

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- SILC
  - The SILC is a substitute for the IDOC control for offices that cannot or do not respond to IDOC signals.
  - The system blocks selected incoming calls.
  - Two thresholds are present for controls. The two thresholds are levels 1 and 2. When both levels are active, level 2 controls.
  - Each threshold has two modes. The SILC can use one mode at a time. The modes are:
    - blocking by preset percentage of incoming calls
    - blocking by preset gap between incoming calls
  - When the system blocks calls:
    - The system sets trunk states to lock out.
    - The trunks send a start dial signal in the form of wink.
    - The system sends a 120-ipm tone on the trunk after the start dial.
  - The start dial signal makes sure the system cannot hold senders in connecting offices. The 120-ipm tone warns the calling party that the call is not complete. Less holding time is available.
- DRE
  - The DRE reserves a number of idle trunks for incoming traffic.
  - The DRE applies to selected two-way trunk groups.
  - The reservation level is 1 to 63 trunks.
  - One hundred percent of DAR arrives in the next in-chain route when the threshold is reached.

## Network Management - Enhanced (continued)

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- PRE
  - The PRE is like DRE. The PRE only affects alternate-routed traffic.
- CANT
  - The CANT cancels a preset percentage of defined traffic offered to a specified trunk group.
- CANF
  - The CANF restricts the number of calls that the system allows to overflow a trunk group.
- SKIP
  - The SKIP advances a percent of DAR traffic from a trunk group to the next in-chain route.
- ITB
  - The ITB allows you to use the NWM to change a percentage of incoming trunks that operate to a remote busy state.
  - Only incoming or two-way trunk groups equipped for remote make busy can use ITB.
- STR
  - The STR is an extension of DRE and PRE. The STR includes HTR codes.
  - The STR does not allow specified types of traffic to access a trunk group when the number of idle trunks reaches a specified level.
  - Two STR levels are available.
  - The system compares high-usage (HU) trunk groups to one level. The system compares full/final trunk groups to two levels.
  - The system blocks a specified percentage of HTR traffic at the first level. The system automatically applies skip controls.
  - The NWM must manually declare codes to HTR.
  - The second level can only occur on full/final trunk groups.
  - The STR cancels 75 percent of HTR direct-routed. The STR cancels 100 percent of alternate routing (AR).
  - The NWM can specify the cancellation of a percentage of non-HTR direct-routed traffic. The range of percentage is between 1 to 100.

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**Network Management - Enhanced** (continued)

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The percentage of traffic that the system blocks for STR and HTR levels appears in the following table.

**Percent of traffic blocked for STR and HTR levels**

Level	Direct	Alternate		
	Non-HTR (effect of STR only)	HTR (effect of STR & HTR)	Non-HTR (effect of STR only)	HTR (effect of STR & HTR)
1	N.A.	X%	N.A.	X%
2	X%	75%	100%	100%

**Note 1:** N.A. = Not applicable

**Note 2:** X = 0-100% For the percentage that you manually specify by the parameters of the APPLY STR command.

- CBK
  - The CBK blocks calls at a specified rate and for specified codes. The CBK uses:
    - blocking by a preset percentage of incoming calls
    - blocking by a preset gap between incoming calls
  - The system can activate the CBK on 1 to 18 digits.
  - The CBK can be active on a maximum of 256 codes.

**Note:** The number of PRP controls activated at the same time as CBK subtracts from the maximum acceptable CBK controls.

- PRP
  - The PRP allows NWM to assign codes to special registers for code-related traffic counts. The codes range from 1 to 18 digits.
  - The PRP provides peg count data for each specified code.
  - The PRP does not block any calls.
  - The PRP can activate on a maximum of 256 codes.

**Note:** The number of PRP controls activated at the same time as CBK subtracts from the maximum acceptable CBK controls.

## Network Management - Enhanced (continued)

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- HTRF
  - The HTRF allows NWM to flag specified codes as HTR. These codes range from 3 to 6 digits.
  - The system monitors the codes when trunk selection occurs. The system skip routes a percentage of traffic.
  - The HTR is an important part of the STR feature.
- RRTE
  - The RRTE allows a percentage of traffic to reroute.
  - Reroutes must be preplanned.
  - The database can contain a maximum of 256 reroute numbers.
  - Each reroute number can have 16 subroutes. These subroutes are VIA routes.
  - Each subroute can have a different control percentage.
  - Only one subroute can be active at any one time.
- DOC
  - The DOC applies NWM control in response to an external signal or an internal overload in the switch.
  - Three levels of DOC signals are present:
    - DOC 1: The MF receiver attachment delay causes problems in other offices.
    - DOC 2: The CPU occupancy exceeds the threshold.
    - DOC 3: Call processing stops.

### Reroute guidelines

This section is a job aid for network management centers (NMC) and operating company personnel who write translations for reroutes. Different types of reroutes require different types of translations.

Reroutes expand the engineered capacity of the network in real time. The use of reroutes applies in the following conditions:

- facility failures
- trunk shortages because of peak day or peak load conditions
- if the system must move traffic around an overloaded or failed tandem switch

Reroutes can improve call completions and service to subscribers.



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**Network Management - Enhanced** (continued)

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A reroute control starts with an originating office (A) and a destination office (B) that trunk group A-B connects. Calls that cannot access the A-B trunk group overflow according to a specified in-chain route advance pattern. Calls that cannot access the trunk groups in the in-chain route fail. The system sends these calls to a final handling treatment. This treatment is normally an announcement or a 120-ipm reorder tone. A reroute control can allow these calls to complete.

A reroute requires a third office (V). Another name for the third office (V) is the VIA or TO office. Trunk groups A-V and A-B connect these offices. Trunk groups A-V and V-B must be outside the in-chain routed advance pattern of A-B.

A reroute sends calls that cannot access A-B to A-V. This action allows the calls to complete to office B if trunk groups A-V and V-B have idle capacity. The system returns calls that cannot access A-V. The system returns these calls to the next trunk group in the normal in-chain route advance pattern of A-B.

A reroute control changes the normal in-chain route advance pattern. The reroute control inserts an out-of-chain trunk group in the set of in-chain trunk groups. Rerouted calls that encounter an all trunks busy (ATB) condition on the A-V trunk group do not advance on the routing chain of the trunk group. The calls return in-chain to locate the next route. These routes include alternate route, announcement, busy tone, and reorder tone.

The cancel in chain return option (CICR) makes sure rerouted calls that find all trunks busy on the A-V trunk group cannot return in-chain. The system cancels these calls. The system sends the calls to the no circuit announcement (NCA). This procedure also occurs when the VIA route is a high-use trunk group with capacity up chain. You must not reroute calls to a dummy trunk group. A dummy trunk group has 0 or 1 trunk members and advances to the normal group. The reroute of calls to a dummy group cancels the rerouted calls. The NCA receives the calls if the CICR option is in use.

A single reroute is not always available if the A-V and V-B trunk groups can carry the rerouted traffic. Some switches can allow traffic to reroute from one originating A-B trunk group to several different VIA offices. The system can normally specify a maximum of seven VIA offices.

You can use two methods to define the sequence of VIA route selection for rerouted calls. The two methods are ordered hunt and spray. In an ordered hunt, the system offers a rerouted call successively to many specified VIA trunk groups. The system specifies the trunks when the system activates the reroute. This condition follows a circular hunt plan.

## **Network Management - Enhanced** (continued)

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If the VIA trunk groups cannot transport the call, the call returns to the next in-chain trunk group. If the VIA trunk transports the first call, the system offers the next rerouted call. The system offers this call to another trunk group. This trunk group follows the trunk group that carried the first rerouted call. If the call overflows, the system offers the call in sequence to the rest of the VIA groups. The system offers the call until a VIA group carries the call. The system offers the call until the system hunts all the VIA trunk groups and fails to transfer the call. If this condition occurs, the call returns in-chain.

The spray method is available with the BCS23 or later versions of the generic program. The system can offer a specified call to the next in-chain trunk group. The system offers the next rerouted call to a specified VIA trunk group. This trunk group follows the trunk group to which the system offered the previous rerouted call. The system does not hunt trunk groups for each call.

The network manager must determine the trunk groups that the system can reroute in each office. The correct switching system translation forms can identify these trunk groups.

The best FROM, TO, and VIA route candidates are normally the only route and final trunk groups. High-use trunk groups can be good candidates in specified conditions. A high-use trunk group is good if the alternate final group of the group transports more than the engineered capacity. A reroute on one or more of the high-use groups helps to deload the alternate final group. The route of the calls advances to the normal alternate final group when the reroute VIA group overflows.

Two-way trunk groups that are route or final trunk groups in both directions normally overflow in both directions at the same time. An immediate reroute of 25 or 50 percent on only one end can relieve the capacity of the group. This reroute allows 100 percent completions in both directions.

The VIA office must check translations. This check determines if the system can correctly interpret and reroute digits received on rerouted calls that come to that office. Specified offices are better candidates for VIA traffic than other offices. The following conditions determine the good candidates:

- the busy hours of the offices do not coincide
- the completing field or spare capacity is available
- the real time capacity of the switch

Carrier access billing (CABS) requires a record of any potential VIA route to reroute feature group D (FGD) traffic. You must designate the VIA routes in advance. This designation allows correct billing to occur when rerouted calls

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**Network Management - Enhanced** (continued)

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use the VIA route instead of the engineered route. You must list the use of an office. You must file an advance preplan with CABS. This action occurs because an office cannot be a VIA office for an access tandem (AT) and interexchange carrier (IC) direct-routed traffic at the same time. If the VIA office receives traffic that is not appropriate, failures occur in processing the bad route. You must keep records.

The transmission quality of rerouted calls is important. Rerouted calls have an additional link. You can use the following guidelines to maintain good transmission quality when the system activates a reroute:

- One additional link can be on the overall connection.
- Test each potential reroute for transmission before the system activates the reroute. Test the reroutes with the added link. If the reroute adds more than 3 db loss to the call, do not perform the reroute. The operating company must establish a policy about reroutes. The operating company can change this recommendation.
- Test each reroute each year. Keep records of the transmission characteristics.
- Cooperative agreements apply to reroutes for and with ICs. Operating companies must indicate different policies locally before release.
- Operating company personnel must provide a count of all rerouted calls. Operating company personnel must provide this data for each day or week to the trunk servicing, forecasting, and design engineers. This requirement makes sure rerouted traffic does not become a capacity requirement for future capital expenditures.
- The network managers must monitor the VIA machine for capacity before and during the reroute. This procedure makes sure that the quality of the network throughput is maintained. This task can use 5 min and 30 s of machine data.
- High attempts per circuit per hour (ACH) and connections per circuit per hour (CCH) can indicate that transmission is not good. This condition occurs if the test records indicate good transmission. You must remove a reroute if reduction in holding times occurred. You must remove a reroute if connections are impaired in real time.

**Discussion of reroute types**

The CABS billing for FGD reroutes must illustrate that the A-B trunk group is a high-use group. The CABS billing must illustrate that this trunk group advances to a common group. Trunk group A-B can be a high-use group that overflows to an AT. If this trunk group overflows, the reroute does not cause CABS billing errors. Local CABS systems can be different. Consult CABS personnel.

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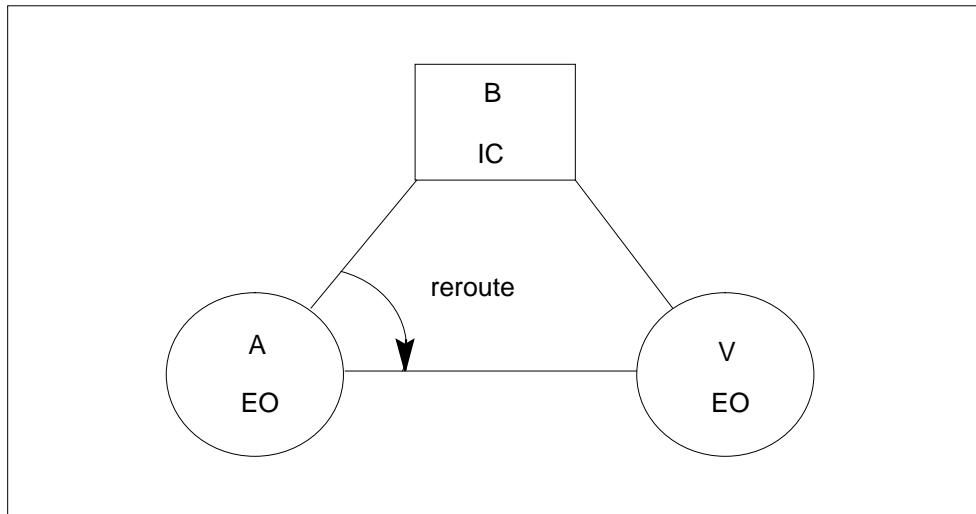
## Network Management - Enhanced (continued)

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The following procedures appear in the figure that follows:

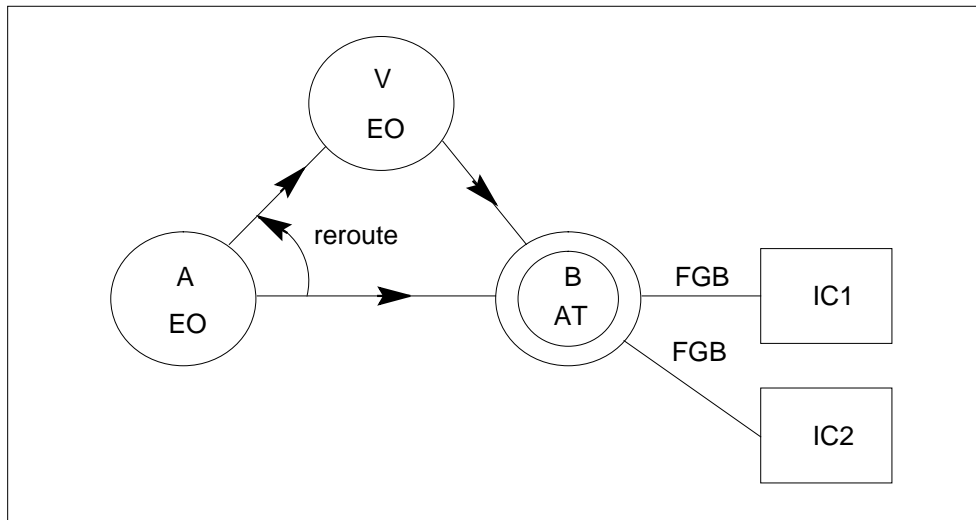
- the reroute of feature group C
- feature group B with direct trunks to an IC
- feature group D with direct trunks to an IC

### Reroutes of FGB, FGC, and FGD traffic



The reroute of feature group B traffic that an AT services appears in the following figure. This type of reroute does not cause CABS billing errors.

### Reroute of FGB traffic



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## Network Management - Enhanced (continued)

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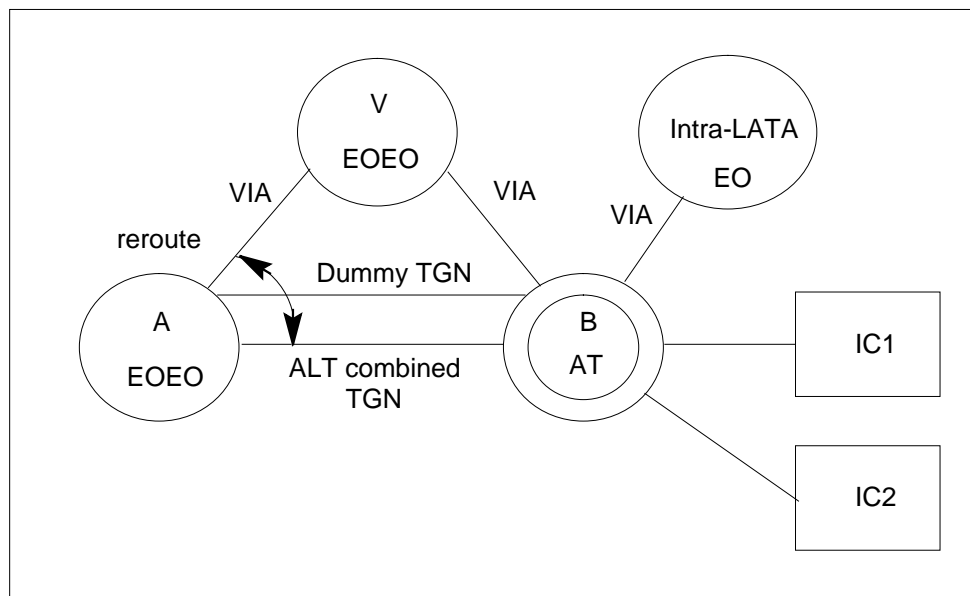
A reroute of local and intra-LATA toll allows ICs full access to the combined trunk group. If B to IC1 and IC2 are at capacity, the reroute protects local traffic. If B to IC1 and IC2 are not at capacity, the reroute protects local, intra-LATA toll, and IC traffic. This type of reroute does not cause a CABS billing problem.

**Note:** Capacity must be available on VIA routes and in the VIA office before the system can use the reroute.

Trunk servicing and forecasting must receive data. This condition allows the ICs to be aware of a requirement to expand capacity. This condition allows the trunking requirements for the future to reflect current loads.

The reroute of local or intra-LATA toll traffic, or both, appears in the following figure. This reroute is from a combined trunk group to an AT that carries FGD inter-LATA traffic. The reroute provides expanded access to the IC when the system activates the reroute.

### Reroute of local or intra-LATA toll traffic, or both

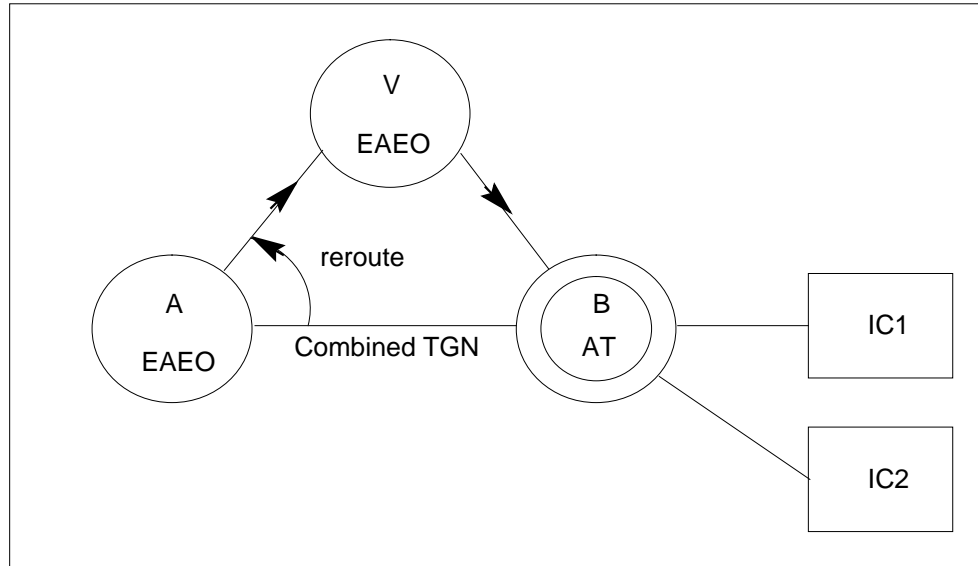


The A-B group can be a direct final to the AT or a high-usage group, which normally overflows to the AT. Billing errors do not occur if the CABS billing system illustrates the combined group as a common group. The TGN is not on the bill. The bill contains a common group identifier. If the TGN is on the bill, the system must notify CABS of the reroute VIA TGN. The message reflects another alternate final TGN.

## Network Management - Enhanced (continued)

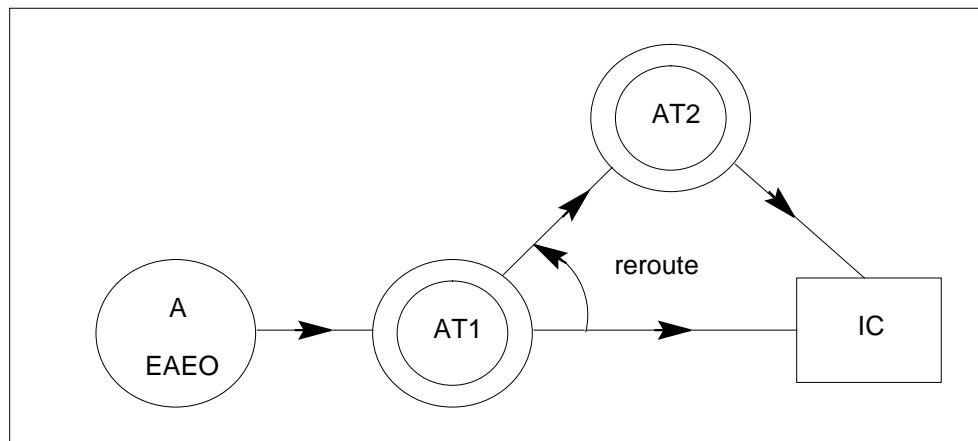
The reroute of a combined trunk group appears in following figure. The combined trunk group can transport local, intra-LATA toll, and FGD IC traffic. The trunk group carries this traffic from an equal access end office (EAEO) to an AT VIA (TO) or to another EAEO.

### Reroute from an EAEO to an AT VIA another EAEO



The reroute of specified calls appears in the following figure. These calls originate in an EAEO and transfer to an IC through an AT VIA another AT. The AT 1 must output 0ZZ+XXX or INX+XXX+01R codes to AT 2. The AT 2 treats the call as when the EAEO homes directly on AT 2. The CABS billing error does not occur. Billing occurs in the EAEO.

### Reroute from an EAEO to an AT VIA another AT



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**Network Management - Enhanced** (continued)

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**Reroutes in originating office**

Reroutes that originate in a DMS-100/200 switch with BCS22 and earlier generics require planned and preprogrammed translations. You must perform manual analysis of OM reports to determine candidate FROM and TO trunk groups for each reroute. The DMS-100/200 switch does not provide an interface with the EADAS/NM system.

You can program a maximum of 256 reroutes in each switch. Each reroute can have a maximum of 16 possible VIA (TO) routes. Each reroute can use only one route at a time. This condition occurs because the DMS-100/200 switch does not have the Spray Reroute feature.

Each VIA can be programmed at a different percentage level. This action is not a requirement. The system can specify a different percentage when the reroute occurs. The programmed percent is a default value. You can use this value if a specification of the percentage does not occur at the time of activation.

Direct-routed (DR) or alternate-routed (AR) traffic, or both types of traffic normally use the FROM trunk group. The system treats all types of traffic the same. The system reroutes all traffic at the same percentage.

The BCS23 generic has the FRR feature. This feature eliminates the requirement for preprogramming. The BCS23 supports the Spray Reroute feature of the ordered hunt variety. The BCS23 supports different percentages that reroute DR or AR traffic, or both.

You must review the basic translations in use to reroute calls. This review makes sure that the translations are in place before the system uses the feature.

The use of a DSM-100 switch, even with the EA feature, cannot occur as a VIA office for FGD calls. This condition can occur if you add the Tandem feature to the switch. The system must translate the switch as an AT. If these conditions apply, the system can use this switch as a VIA for FGD reroutes that use the current translations. Translations in the originating office for FGD reroutes are the same as addressed in dummy and FGD trunk groups.

The network manager can reroute calls that originate in a DMS-100/200 switch with generic BCS22 and earlier versions. Three-digit codes that the system must not reroute do not appear in translation tables. The network manager must make sure the system can correctly reroute all codes that

## Network Management - Enhanced (continued)

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normally route on a specified group. Failure to perform this action can cause the following problems:

- transmitter or receiver timeouts in the originating or VIA office
- possible loss of revenue
- calls completed to numbers that are not correct
- customer trouble reports

The system cannot always reroute specified codes that use the trunk group. A reroute can cause the codes to misroute. If these conditions occur, you must split the trunk group between the affected offices in two trunk groups or subgroups. See "Dummy and FGD trunk groups" for information on how to build trunk subgroups.

The route reference number (RTEREF) points to the first trunk group that handles calls in-chain. The codes that the system must reroute provide the RTEREF. The second trunk group normally handles codes that the system cannot reroute. The second trunk handles calls that overflowed the first group. A reroute can occur on the first group. The reroute specifies the desired reroute percentage. This procedure allows the system to reroute all other traffic. This reroute does not affect the codes that the system cannot reroute.

*Note:* The BCS23 generic can identify codes that the system cannot rewrite in software. If the BCS23 can identify these codes, the preceding procedure is not a requirement.

Obtain a copy of table OFRT to determine the trunk groups that are candidates as FROM or VIA (TO) trunk groups. You can obtain table OFRT from the NWM terminal.

You can identify the trunk groups that are route or final groups. To identify these groups, you must determine the tuples that have the data for final handling. The tuples do not have a circuit announcement (NCA) or reorder tone (120 ipm tone). The final routing of each trunk group must end with 120 ipm or NCA and 120 ipm.

Sample datafill for table OFRT tuples that meet these requirements appear in the following example.



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**Network Management - Enhanced** (continued)

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**MAP example for table OFRT**

RTE	RTELIST
8	(N D CHFDIN01378TC 3 N N) (T RRTE 10) (ST 216)\$
216	( S D NCAANN) ( ST 400)\$
297	( S D NCAANN) ( ST 299)\$
299	( S D T120)\$
400	( S D T120)\$

A tuple can be a final trunk group. This tuple must have one trunk group CLLI code in the route list. The tuple must precede list 216, 297, 299, or 400. This tuple can be the only route trunk group.

The RTE 8 is a trunk group. The CLLI code of this trunk group is CHFDIN01378TC, with a normal next route of NCA (ST 216)\$. The RTE 8 trunk group has an additional entry before the normal next route. The system reroutes the position of RRTE in the route list when the system activates the reroute feature. The position of RRTE in the route list is the point at which the specified percent of overflow traffic FROM the previous CLLI code in the route list reroutes. This reroute occurs when the reroute feature is active. The position of RRTE indicates that table RRTE index 10 can serve as a next route before the index transfers to NCA if the reroute activates. The RRTE is the table name for reroutes. Index 10 is the reroute number.

In table OFRT, add reroute assignments to a current trunk group. All data lines are present in the table. The data line that assigns the reroute is not in the table.

You must build table REROUTE and subtables REROUTE.NWMRROUT. Build these tables when the different selections for VIA (TO) trunk groups appear. Table REROUTE maps the reroute number that appears in the route list of table OFRT to the correct list of VIA routes. Subtable NWMRROUT contains the list of VIA routes.

Build table REROUTE to a size equal to or greater than the maximum number of reroutes needed in this switch. The maximum number of reroutes is 256. You must build table REROUTE to the maximum size because you must delete the current data to extend the table length. You must use the EXT (extend) command with a negative argument to change the size to zero. You must enter the EXT command again with the new value. You must rebuild all previous reroutes. Sample datafill appears in the following example.

---

**Network Management - Enhanced** (continued)
 

---

**MAP example for subtable REROUTE.NWMRROUT**

```

Subtable REROUTE.NWMRROUT

RRTSUB  TABID      KEY      LEVEL
-----
0        OFRT       11       100
1        OFRT       14       100
2        OFRT       20       100
  
```

**Reroutes in VIA office**

A DMS-100/200 switch can operate as a VIA office for 7/10-digit local or intra-LATA toll reroutes, or both. The switch does not require additional translations. The system translates calls incoming on a trunk group in a standard pretranslator or without a pretranslator. The system translates these calls with or without class of service screening. The screening can block calls that must not complete for a tandem. The system translates the digits received. The system routes the digits to a local office code or to another office. The system uses the same method to handle calls as when the calls originate from a line in the office.

You cannot use the DMS-100 switch as a reroute VIA office for FGD EA calls. You can use the DMS-100 switch as a reroute VIA office if the office has the Tandem feature. The office must translate as an AT. If the AT feature is not available, the DMS-100 switch cannot repeat the special winks back to the originating EAEO. This condition is necessary for EA reroutes. You can add the Tandem feature to a current switch to have an emergency tandem backup. The AT translations must complete to allow the office to operate as a VIA for FGD reroutes. The AT translations must complete to allow the office to operate as an emergency backup to an AT.

**Dummy and FGD trunk groups**

The system reroutes the FGD in a DMS-100/200 switch by the same method as any other reroute in the originating office. The VIA office that the system chooses can be a DMS-100 switch. If the VIA office is a DMS-100 switch, the office must have the Tandem feature and translate as an AT switch. Additional capacity can be available for FGD traffic. To provide additional capacity, the system must use trunk subgroups to reroute local and intra-LATA calls off a combined trunk group.

The system can route FGD traffic that originates in an EAEO. The system can route this traffic through an AT switch that forwards the calls to the correct IC.

---

**Network Management - Enhanced** (continued)

---

The trunk group from the EAEO to the AT normally carries combined traffic. This traffic can include inter-LATA toll, intra-LATA toll, and local traffic.

Operating companies can choose not to reroute inter-LATA traffic from a combined group. Operating companies can reroute only intra-LATA toll or local calls, or both types of calls. This ability allows increased capacity on the combined group for inter-LATA IC traffic. This type of reroute allows the system to avoid the addition of an additional link to FGD traffic. The addition of an additional link reduces transmission quality. The system can avoid CABS billing problems with FGB or FGD reroutes. The system can segregate ICs who request a reroute from the ICs who do not request a reroute.

To perform this type of reroute, you can build a dummy trunk group in the originating office. The dummy group must have a minimum of one member in the group. The trunk can be a trunk from the combined group and can transport good traffic. This procedure makes the dummy a trunk subgroup. Communication with the following points must occur:

- the circuit administration center
- network administration center
- switching control center forces

Make sure these records are correct for the two trunk groups. Make sure data storage is correct for future engineering requirements.

The system must first reroute intra-LATA or local traffic, or both, to the dummy group that overflows to the combined group. A reroute on the dummy group removes intra-LATA toll or local traffic, or both, from the combined group. The system must not reroute calls to the dummy trunk group. These calls cannot overflow to the shared group. The cancel in-chain return (CICR) option does not force rerouted calls to route up the routing chain of the dummy group.

The system can use the same method to reroute traffic of a specified IC off the combined group. This method occurs when the system first routes the IC to a dummy group that overflows to the combined group. The system must apply a reroute to the dummy group. The VIA office cannot be a DMS-100 switch only, unless the VIA office has the Tandem feature and translates as an AT.

**Reroutes for terminating calls**

The system can terminate FGD reroutes from an AT switch by the same method as for local or intra-LATA tandem reroutes.

## **Network Management - Enhanced** (continued)

---

Calls incoming from an IC to an AT switch do not require special signaling. Originating FGD calls do require special signalling. The system can reroute calls incoming from an IC to an AT switch from the AT. The system can use any end office as a VIA office. The system must translate the VIA office to process local tandem traffic. This procedure includes the DMS-100 switch without the AT feature.

Access billing for the IC occurs at the first point of entry in the LATA. This first point in the LATA is the AT switch. This event occurs before a reroute affects the outgoing trunk group to the end office.

Local operating company or regional policy can allow the termination of reroutes from an IC to an end office VIA another end office.

Operating companies normally allow an IC to reroute terminating traffic through another end office on peak days or during an emergency. Offices that normally serve business customers have much excess capacity.

To allow this type of reroute, the system must change the incoming screening in the office to use as a VIA. The system changes the office to allow calls to other central offices to tandem through. This event normally occurs in the digit interpretation for the incoming trunk group.

If this type of reroute must occur, the CABS billing database must display the VIA office as an AT. All codes that the system can reroute through the office must subtend to the office. The AMA entry for calls incoming from an IC contains an identifier for the carrier and the destination office code.

The system checks each destination office code if the code is a correct code to route to or through the office. If the code is not correct, a CABS billing error occurs. When the office appears as an AT with the rerouted codes as subtending in CABS, billing is correct. If billing is not correct, the billing feature does not make access charges to the IC for completion of the calls.

You can restrict IC reroutes VIA an operating company end office during times that are not peak days or emergencies. This procedure occurs when the screening or digit interpretation for the incoming trunk group back changes to the original form.

### **Reroute summary**

Reroutes in DMS-100/200 switch offices with BCS22 and earlier generic programs require preprogrammed translations. The BCS23 generic program can have the FRR capability.

**Network Management - Enhanced** (continued)

The FRRs require fewer translations in the originating office. You can use or change the FRRs. Preprogrammed translations can provide a safer method to reroute FGD calls to the correct VIA (TO) office. You can program the office to act as a VIA for FGD to an AT or to a connected IC. The office cannot serve as a VIA to both types of calls. The network manager must maintain complete current records for any translations for FGD reroutes. Failure to maintain records can cause the following conditions:

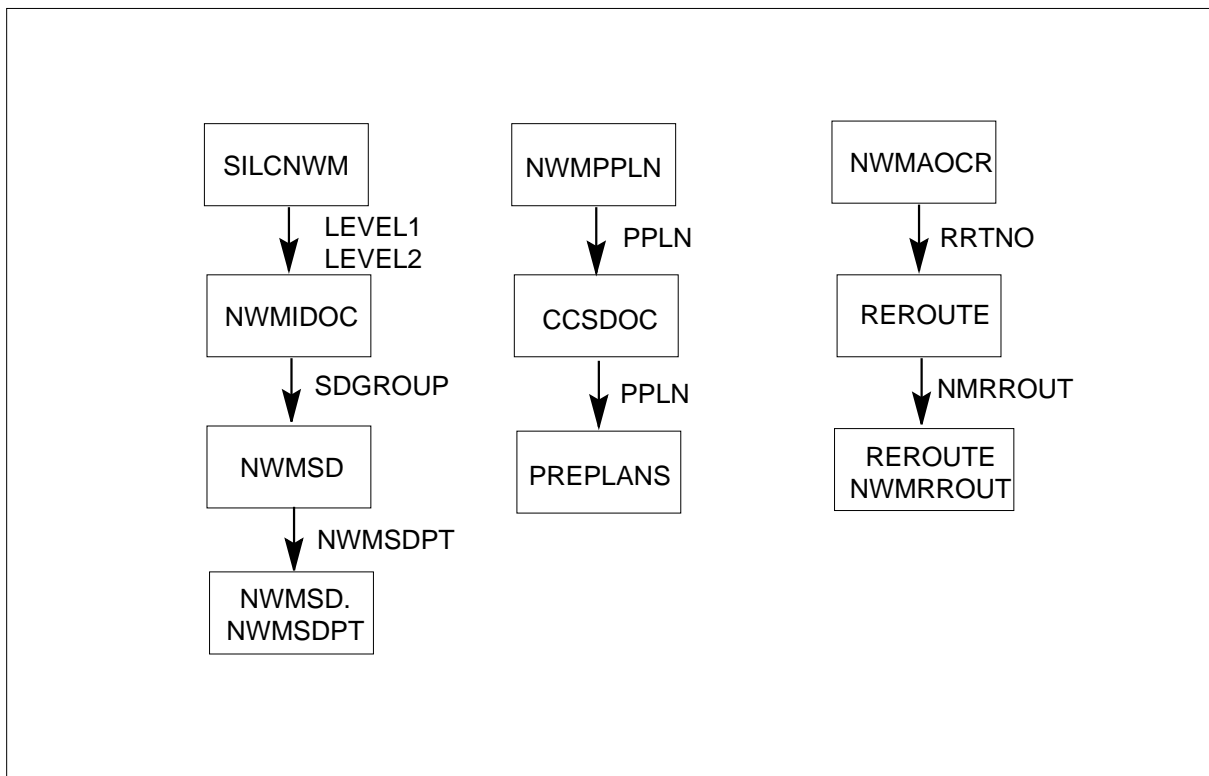
- the loss of calls that produce revenue
- transmitter or receiver timeouts in the originating or VIA office, or in both offices
- customer trouble reports

Translation errors can occur if a loop condition occurs in translations or through the use of reroute controls. The network manager must apply caution when the network manager plans and implements reroute controls.

**Translations table flow**

The Network Management - Enhanced translation process appears in in the following flowchart.

**Table flow for Network Management - Enhanced**



## **Network Management - Enhanced** (continued)

---

### **Limits**

The following limits apply to Network Management - Enhanced:

#### **Table SILCNWM**

The SILC gapping values that appear in table SILCNWM appear in tenths of seconds. You must include a decimal point in the LEVEL1 and LEVEL2 entries of table SILCNWM. Single quotes must enclose the value entered.

You can enter any correct trunk group in table SILCNWM. The SILC is only compatible with single-stage MF trunk groups.

#### **SILC trunk groups**

The SILC applies to incoming or two-way trunk groups between the DMS-100 switch and EA inter-LATA carrier switches.

The SILC provides only a single start dial signal. Trunk groups that require automatic number identification (ANI) spill or multistage outpulsing do not complete outpulsing on calls that SILC blocks. Outpulsing is not complete. The subscriber cannot connect for the call and does not receive the 120 ipm tone. The system holds the digit sender in the originating office until the subscriber abandons the call or the originating office times out.

#### **Flexible reroute (FRR)**

The system removes FRR controls from all trunk groups when a cold or reload restart occurs.

Each FRR VIA route list entered in table PREPLANS contains only one VIA route.

For FRR controls to reroute calls in the network, the following conditions must occur:

- The switching system that applies FRR controls must collect destination codes from the line and trunk groups. These destination codes have 7 and 10 digits. Examples of these destination codes are NXX-XXXX or NPA-NXX-XXXX.
- Before outpulsing can occur over the in-chain route, the switching system must delete, replace, or insert digits in the destination code. When the switching system outpulses over a VIA route, the system must outpulse the complete destination code. You must not delete or replace the digits in this destination code. Digits cannot be prefixed to the destination code.

---

## Network Management - Enhanced (continued)

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The selection of a trunk group for a call from the standard pretranslator (table STDPRTCT) can occur. The system can apply an FRR control to the trunk group. If these conditions occur, the following limits apply:

- The HTR code control does not affect the call when the system applies the code against the following digits:
  - the area code (AC) of the call
  - the non-area code (NAC)
  - country code digits (CC)

The HTR code does not affect the call because the setup of these code controls occurs in subtable HNPACODE.

- If the system reroutes the call across an NPA boundary, the NPA is not prefixed to the outpulsed digits when the the NPA is not part of the digits collected from the incoming trunk group or incoming line.

### Interactions

The NTX060BB, Network Management - Enhanced, is an improvement to feature package NTX060AB, Network Management.

### Activation/deactivation by the end user

Network Management - Enhanced does not require activation or deactivation by the end user.

### Billing

Network Management - Enhanced does not affect billing.

### Station Message Detail Recording

Network Management - Enhanced does not affect Station Message Detail Recording.

## Network Management - Enhanced (continued)

### Datafilling office parameters

Office parameters that Network Management - Enhanced uses appear in the following table. Refer to the *Office Parameters Reference Manual* for additional information on office parameters.

#### Office parameters used by Network Management - Enhanced

Table name	Parameter name	Explanation and action
OFCENG	NUM_EGR_NWM_TRKGRP_CTRL	Defines the number of FRR controls that can be active at the same time in the whole office. Range is 0 to 255.
OFCENG	NUM_OF_RTEB_EXTBLKS	Defines the number of extension blocks available for rerouted calls. Range is 0 to 5000.  Extension blocks remain attached to calls that the FRR control reroutes when the calls route through call processing. You must specify the number of extension blocks reserved for FRR.
OFCOPT	SDOC3_ENABLE	Specifies if the system can automatically activate or deactivate machine congestion level 3 signaling. Level 3 signals transmit to connecting offices if a switch cannot operate. The SDOC3_ENABLE must have the value Y to allow level 3 signaling.
OFCOPT	NWM_STR_CTRL	Allows the system to enable or disable STR on the switch. If the switch requires STR, NWM_STR_CTRL must contain the value Y. If the switch does not require STR, NWM_STR_CTRL must contain the value N.

### Datafill sequence

The tables that require datafill to implement Network Management - Enhanced appear in the following table. The tables appear in the correct entry order.

#### Datafill tables required for Network Management - Enhanced (Sheet 1 of 2)

Table	Purpose of table
SILCNWM	SILC Control. This table specifies trunk groups for NM controls.
NWMIDOC	Network Management Internal Dynamic Control. This table defines dynamic overload controls.



---

**Network Management - Enhanced** (continued)

---

**Datafill tables required for Network Management - Enhanced (Sheet 2 of 2)**

<b>Table</b>	<b>Purpose of table</b>
NWMSD	Network Management Signal Distributor Group. This table defines signal distribution groups.
NWMSD. NWMSDPT	Network Management Signal Distributor Point. This table defines signal distribution points.
NWMAOCR	Network Management Automatic Out-of-Chain Reroute. This table provides AOCR control information.
REROUTE	Network Management Reroute Control. This table defines reroute.
REROUTE. NWMRRROUT	Network Management Reroute Subtable. This table defines reroute.
NWMPPLN	Network Management Preplan Control. This table indicates the maximum number of trunk groups for PREPLANS.
CCSDOC	CCS Selective Dynamic Overload Control. This table provides CCS control information for trunk groups.
PREPLANS	Network Management Preplan. This table selects NM controls.

**Datafilling table SILCNWM**

Datafill for Network Management - Enhanced for table SILCNWM appears in the following table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table SILCNWM**

<b>Field</b>	<b>Subfield or refinement</b>	<b>Entry</b>	<b>Explanation and action</b>
CLLI		alphanumeric	CLLI trunk group identifier. Name must appear in table CLLI.
SCTRL		PCT or GAP	Percent or gapping value to block incoming trunk traffic. Enter PCT or GAP.
LEVEL1		0 to 600	Percent or gapping value for level 1. Range is 0 to 600.
LEVEL2		0 to 600	Percent or gapping value for level 2. Range is 0 to 600.

**Network Management - Enhanced** (continued)

**Datafill example for table SILCNWM**

Datafill for table SILCNWM appears in the following example.

**MAP example for table SILCNWM**

CLLI	SCTRL	LEVEL1	LEVEL2
CAMA2W	PCT	50	75

**Datafilling table NWMIDOC**

Datafill for Network Management - Enhanced for table NWMIDOC appears in the following table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NWMIDOC**

Field	Subfield or refinement	Entry	Explanation and action
MFONTHLD		0 to 255	MF receiver queue length threshold on value to activate control. Range is 0-255 for levels 1 and 2. For level 3, enter 1. A default is not available.
MFOFTHLD		0 to 255	MF receiver queue length threshold off value to deactivate control. Range is 0-255 for levels 1 and 2. For level 3, enter 1. A default is not available.
CPONTHLD		0 to 100	CPU occupancy threshold on value to activate control. This field is a new field. Range is 0-100 for levels 1 and 2. For level 3, enter 1. A default value is not available.
CPOFTHLD		0 to 100	CPU occupancy threshold off value to deactivate control. This field is a new field. Range is 0-100 for levels 1 and 2. For level 3, enter 1. A default is not available.

**Datafill example for table NWMIDOC**

Sample datafill for table NWMIDOC appears in the following example.

**Network Management - Enhanced** (continued)

**MAP example for table NWMIDOC**

```

Table NWMIDOC

IDOCLEV MFONTHLD MFONFILT MFOFTHLD MFOFFILT CPONTHLD
CPONFILT CPOFTHLD CPOFFILT SDGROUP SDPT
-----
      1      2      4      2      2      2      0      2      3      4
      2      4      2      2      0      3
    
```

**Datafilling table NWMSD**

Datafill for Network Management - Enhanced for table NWMSD appears in this table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NWMSD**

Field	Subfield or refinement	Entry	Explanation and action
This package does not change this table.			

**Datafill example for table NWMSD**

Sample datafill for table NWMSD appears in the following table.

**MAP example for table NWMSD**

```

Table NWMSD

SDGROUP      TMTYPE      TMNO      TMCCTNO      CARDCODE
-----
      0      MTM      4      4      2X57AA
      1      MTM      4      5      2X57AA
    
```

**Datafilling table NWMSD.NWMSDPT**

Datafill for Network Management - Enhanced for table NWMSD.NWMSDPT appears in the following table. The fields that apply to Network Management

## Network Management - Enhanced (continued)

- Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

### Datafilling table NWMSD.NWMSDPT

Field	Subfield or refinement	Entry	Explanation and action
		See subfield	This package does not change this subtable.

### Datafill example for table NWMSD.NWMSDPT

Sample datafill for table NWMSD.NWMSDPT appears in the following example.

### MAP example for table NWMSD.NWMSDPT

Subtable NWMSD.NWMSDPT			
SDGROUP	SDPOINT	NORMST	SDDATA
0	0	0	IDOC1
0	1	0	IDOC2
0	2	0	FREE
0	3	0	FREE

### Datafilling table NWMAOCR

Datafill for Network Management - Enhanced for table NWMAOCR appears in the following table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

### Datafilling table NWMAOCR (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
AOCR		0 to 63	Automatic out-of-chain reroute that the operating company assigns. Range is 0-63.
RRTNO		0 to 255	Reroute subtable number. Range is 0-255.
RRTSUB		0 to 15	Reroute subtable index. Range is 0-15.
ACTCLI		alphanumeric	CLLI that activates the control

**Network Management - Enhanced** (continued)

**Datafilling table NWMAOCR (Sheet 2 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
ACTPCT		0 to 100	Percent overflow threshold on the active CLLI to activate the control. Range is 0-100.
OVFLCLLI		alphanumeric	CLLI to reroute traffic. If a group control is active on the CLLI, the system removes the AOCR control if the control is active.
OVFLPCT		0 to 100	Percentage overflow threshold on the overflow CLLI to activate the control. Range is 0-100.

**Datafill example for table NWMAOCR**

Sample datafill for table NWMAOCR appears in the following example.

**MAP example for table NWMAOCR**

```

Table NWMAOCR

AOCR RRTNO RRTSUB ACTCLLI ACTPCT OVRFLCLLI OVRLPCT
-----
  4   1   7   CAMA2W   100   HULO   67
    
```

**Datafilling table REROUTE**

Datafill for Network Management - Enhanced for table REROUTE appears in the following table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table REROUTE**

Field	Subfield or refinement	Entry	Explanation and action
RRTNO		0 to 1023	Reroute number. Range is 0-1023.
NWMRROUT		0 to 15	Index in subtable REROUTE.NWMRROUT. Range is 0-15.

**Datafill example for table REROUTE**

Sample datafill for table REROUTE appears in the following example.

## Network Management - Enhanced (continued)

### MAP example for table REROUTE

Table REROUTE	
RRTNO	NWMRROUT
-----	
0	3
1	4

### Datafilling table REROUTE.NWMRROUT

Datafill for Network Management - Enhanced for table REROUTE.NWMRROUT appears in the following table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

#### Datafilling table REROUTE.NWMRROUT

Field	Subfield or refinement	Entry	Explanation and action
RRTSUB		0 to 15	Reroute subtable index. Range is 0-15.
TBLNM		alphanumeric	Table name for reroute of the percent of traffic in field LEVEL. In a local/toll office, enter OFRT. In a DMS-300 switch, enter one of the values in the range OVR0-OVR9.
IDX		0 to 1023	Index to table in field TBLNM. Range is 0-1023.
LEVEL		0 to 100	Percent of traffic to redirect. Range is 0-100.

### Datafill example for table REROUTE.NWMRROUT

Sample datafill for table REROUTE.NWMRROUT appears in the following example.

**Network Management - Enhanced** (continued)

**MAP example for table REROUTE.NWMRRROUT**

```

Subtable REROUTE.NWMRRROUT

RRTSUB          TBLNM          IDX          LEVEL
-----
0              OFRT          110          100
1              OFRT          111           50
2              OFRT          110          100
3              OFRT          111           50
    
```

**Datafilling table NWMPPPLN**

Datafill for Network Management - Enhanced for table NWMPPPLN appears in the following table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NWMPPPLN**

Field	Subfield or refinement	Entry	Explanation and action
This package does not change this table.			

**Datafill example for table NWMPPPLN**

Sample datafill for table NWMPPPLN appears in the following example.

**MAP example for table NWMPPPLN**

```

Table NWMPPPLN

PPLN  NCTRLS  CCS
-----
0      8        N
1      8        N
2      8        N
    
```

**Datafilling table CCSDOC**

Datafill for Network Management - Enhanced for table CCSDOC appears in the following table. The fields that apply to Network Management - Enhanced

**Network Management - Enhanced** (continued)

appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table CCSDOC**

Field	Subfield or refinement	Entry	Explanation and action
SCLLI		alphanumeric	Short CLLI. Enter the CLLI of the trunk group to apply only SDOC controls.
CONTROL1		see subfield	This field contains subfields PPLNO and PPLNCTRL.
	PPLNO	0 to 255	Preplan number with the control to act on. Range is 0-255.
	PPLNCTRL	0 to 31	Preplan control number with the control to act on. Range is 0-31.
CONTROL2		see subfields	This field contains subfields PPLNO and PPLNCTRL.
	PPLNO	0 to 255	Preplan number with the control to act on. Range is 0-255.
	PPLNCTRL	0 to 31	Preplan control number with the control to act on. Range is 0-31.
CONTROL3		see subfields	This field contains subfields PPLNO and PPLNCTRL.
	PPLNO	0 to 255	Preplan number with the control to act. Range is 0-255.
	PPLNCTRL	0 to 31	Preplan control number with the control to act on. Range is 0-31.

**Datafill example for table CCSDOC**

Sample datafill for table CCSDOC appears in the following example.



**Network Management - Enhanced** (continued)

**MAP example for table CCSDOC**

```

Table CCSDOC
SCLLI CONTROL1 CONTROL2 CONTROL3
-----
CCS4A 2 3 2 4 2 5
    
```

**Datafilling table PREPLANS**

Datafill for Network Management - Enhanced for table PREPLANS appears in the following table. The fields that apply to Network Management - Enhanced appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table PREPLANS**

Field	Subfield or refinement	Entry	Explanation and action
SELR		STR	Enter STR for selective trunk reservation.
LEV1		0 to 63	Number of trunks. When level 1 activates, the system skip routes the percent specified for field LEVEL of hard-to-reach traffic. Enter the number of idle trunks that activate the level 1 control. Range is 0-63.
LEV2		0 to 63	Number of trunks. When level 2 activates, the system blocks 100% of alternate, 75% of hard-to-reach, and the percent specified for field LEVEL of direct-routed traffic. Enter the number of idle trunks that activate the level 2 control. Range is 0-63.
LEVEL		1 to 100	Enter the percent of traffic to skip route in level 1 and to block in level 2. Range is 1-100.

**Datafill example for table PREPLANS**

Sample datafill for table PREPLANS appears in the following example.

## Network Management - Enhanced (end)

---

### MAP example for table PREPLANS

Table PREPLANS

PPLN	SCLLI	CTRLDATA
2 0	CLINIT	STR 5 6 75

### Tools for verifying translations

Network Management - Enhanced does not use tools for verifying translations.

### SERVORD

Network Management - Enhanced does not use SERVORD.

---

## Preserve EADAS Data Over SW Application-U.S. only

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

DMSCNA05 and later versions

### Requirements

All the datafill information for this particular functionality appears in this document. Complete implementation can require software or hardware.

### Description

Loss of Engineering and Administrative Data Acquisition System (EADAS) site-unique data occurs over a one-night process (ONP). The operating company must enter data again. The Preserve EADAS Data Over SW Application-U.S. only feature places EADAS site-unique data in a datafill table to preserve the data over an ONP.

### Operation

#### Background

The EADAS is a central, minicomputer-based data acquisition system that collects operational measurement (OM) data from switching systems. The system collects OM data through a data link from each office. The system sends the data to the EADAS network management system. EADAS performs the following functions:

- data collection
- report generation
- data base management

**Note:** For more information on EADAS, refer to EADAS Interface and 1A EADAS Network Management in the Base Services section of this document.

#### Table EADAS

The Preserve EADAS Data Over SW Application-U.S. only feature creates table EADAS. The EADAS transfers operating company defined EADAS collection descriptions from the old software load to the new software load during an ONP. This includes the class, section, register and key/info information.

**Preserve EADAS Data Over SW Application-U.S. only** (continued)

This feature also modifies the code that restores the standard collection descriptions Bellcore determines. If table EADAS is available on the old software load, the system transfers the table. The operating company defined EADAS collection descriptions remain the same over the ONP. Otherwise, the system restores the Bellcore standard set of collection descriptions during the ONP.

The system adds all new OM tuple keys in the new software load in the deleted state. The system adds any deleted registers in the new software load as DUMMY registers.

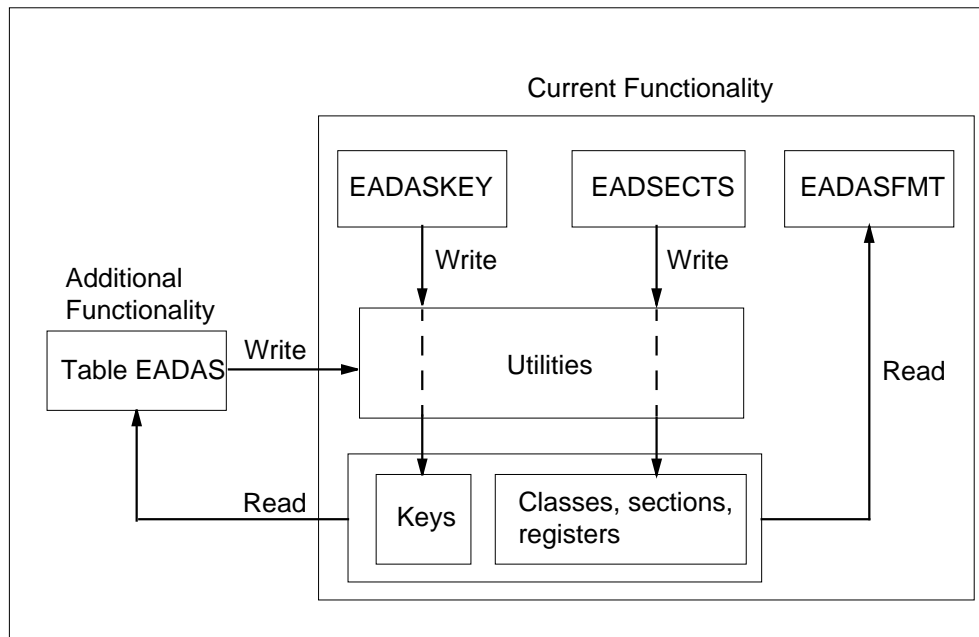
Software updates from pre-table EADAS to table EADAS restore EADAS collection descriptions from the Bellcore standard set.

*Note:* During the restore of table EADAS at ONP, some tuples may not restore. If some tuples do not restore, the system writes those tuples into file FOR\$EADAS\$ADMIN. See FOR\$EADAS\$ADMIN for additional information.

Table EADAS will be available through a patch from BCS36 through CSP04.

The functionality table EADAS adds appears in the following figure.

**Functionality table EADAS adds**



---

**Preserve EADAS Data Over SW Application-U.S. only** (continued)

---

**FOR\$EADAS\$ADMIN**

This file tells the administrator of the EADAS machine of changes which occurred within the DMS in respect to the OM data supplied to the data collector. After ONP, the administrator can use the information in this file to re-align the data collector with the new DMS configuration.

During the restore of table EADAS at ONP, some tuples may not restore. If tuples do not restore, file FOR\$EADAS\$ADMIN is created and the unrestored tuples are written into the file. This is expected behavior and results from the following conditions:

- if an OM group is no longer supported on the restore side and a PRECISION tuple attempts to define a section in a no longer supported OM group, this tuple does not restore and is written to the file
- any tuples that are dependent on a section that is a no longer supported OM group are not restored. These REG, EXT, and KEY tuples are written to the file.
- if a tuple in an OM group is no longer present on the restore side because of software changes and the tuple is included in a section described by table EADAS, the KEY tuple corresponding to the OM group tuple does not restore and is written to the file.

A table EADAS KEY tuple is represented differently during normal operation than during ONP. The KEY tuple consists of:

```
<class> <section> KEY <record identifier>
```

In this instance, class may be EADAS30M, EADAS60M, or EADAS24H. The section is any valid EADAS section number. The record identifier identifies a unique record within the section.

Note that it is the record identifier that changes if table EADAS is accessed during normal operation or during ONP. The record identifier is an alphanumeric string during normal operation. This alphanumeric string uniquely identifies the tuple in an OM group that corresponds to this EADAS record. During ONP, the record identifier becomes a number and is the EADAS record identifier. The system writes the record identifier in ONP form to file FOR\$EADAS\$ADMIN.

The EADAS record identifier is not necessarily identical to the OM group tuple number. Resequencing features AR1856 and AJ4423 compensate for the order of OM tuples if the order changes during ONP. These features compensate so that an EADAS record identifier still maps to the same OM group tuple. Although the OM tuple may be in a different position within the

## Preserve EADAS Data Over SW Application-U.S. only (continued)

---

OM group, the change is transparent to the EADAS interface. The change is transparent because the interface uses EADAS record identifiers to map to a particular OM tuple through OMKEYORD table. These features also prevent KEY tuples from writing to the file because of sequencing issues.

The following is an example. Suppose that on the dump side:

- section 220 of EADAS/DC 30 minute class has an OM group NPAPEG with register ATB, ATB1, and tuple 512
- section 2 has an OM group ANN with tuple 6 present

```
EADAS30M  2 PRECISION  SINGLE ANN ANNATT
EADAS30M  2 REG      1 ANN ANNOVFL
EADAS30M  2 KEY 6    PRESENT                <- EADAS Record ID 6

EADAS30M  220 PRECISION SINGLE NPAPEG ATB
EADAS30M  220 REG 1  NPAPEG ATB1
EADAS30M  220 KEY 512 PRESENT
```

On the restore side, the:

- OM group NPAPEG no longer exists
- OM tuple in the ANN group to which section 2 EADAS record ID 6 maps to no longer exists

After ONP, file FOR\$EADAS\$ADMIN would contain the following for this example.

---

**Preserve EADAS Data Over SW Application-U.S. only** (continued)

---

```
>listsf all
```

```
>print FOR$EADAS$ADMIN
```

```
PLEASE FORWARD THE CONTENTS OF THIS FILE TO YOUR EADAS
ADMINISTRATOR FOLLOWING THE SOFTWARE UPDATE SINCE IT
CONTAINS TUPLES THAT DID NOT RESTORE IN TABLE EADAS.
THE FILE MAY BE ERASED FROM SFDEV ONCE IT HAS BEEN
FORWARDED.
```

The possible error types follow:

- If the OM group does not exist; the PRECISION, REG and KEY items will be included. In this case, the KEY items will show 'NOT\_POSITIONED'.
- If the OM tuple (record) has been resequenced, the KEY item will be included and contain the index number from the old software data prefixed with 'NO\_I\_TO\_INFO' (eg. NO\_I\_TO\_INFO\_23 is index 23).

```
EADAS30M 220 PRECISION SINGLE NPAPEG ATB
EADAS30M 220 REG 1 NPAPEG ATB1
EADAS30M 220 KEY NOT_POSITIONED PRESENT
EADAS30M 2 KEY NO_I_TO_INFO_6 PRESENT
```

EADAS administrators can ignore file OMKEYORD\$INFO\$FILE because any tuples in that file are also in FOR\$EADAS\$ADMIN. These administrators must use FOR\$EADAS\$ADMIN for changes to the EADAS OM configuration.

### **EADSECTS, EADASKEY, and EADASFMT commands**

Table EADAS mirrors the defined collection definitions the following command interpreter (CI) commands create and modify:

- The EADSECTS command specifies the contents of sections and assigns sections into EADAS/DC OM classes. Category is automatic when the system reads the appropriate loadbuild file.
- The EADASKEY command selects the keys of groups to transmit. This command allows the telephone company to transmit only specified keys for a poll.
- The EADASFMT command displays the precision of an EADAS OM class. The EADASFMT also displays the groups that belong to that class

**Preserve EADAS Data Over SW Application-U.S. only** (continued)

and the section identification of the group. The EADASFMT also displays the key and info fields of all group tuples.

In the following example, the EADSECTS command adds registers in the EADAS30M class for sections 1 and 2.

```

> EADSECTS EADAS30M 1 ADD SINGLE DRCW DRCWEATT DRCW
DRCWEDEN DRCW DRCWEOVF +
> DRCW DRCWACT DRCW DRCWDACT DRCW DRCWEUSG DRCW
DRCWSAT DRCW DRCWSAT2 +
> DRCW DRCWSDEN DRCW DRCWSBLK DRCW DRCWRING DRCW
DRCWTATT DRCW DRCWTOVF + DRCW DRCWUNIV DRCW
DRCWDENY DRCW DRCWAUNV DRCW DRCWDUNV
> EADSECTS EADAS30M 2 ADD SINGLE ANN ANNATT ANN ANNOVFL
ANN ANNTRU ANN ANNSBU + ANN ANNMBU
    
```

In the following example, the EADASFMT command displays the EADAS30M class registers in the previous example.

```

> EADASFMT EADAS30M 1

CLASS: EADAS30M      PRECISION: SINGLE      SECTION ID: 1      PRECISION: SINGLE

REGISTER 0  REGISTER 1  REGISTER 2  REGISTER 3  REGISTER 4
RECORD ID  DRCW      DRCW      DRCW      DRCW      DRCW
NUMBER     DRCWEATT  DRCWEDEN  DRCWEOVF  DRCWACT

REGISTER 5  REGISTER 6  REGISTER 7  REGISTER 8  REGISTER 9
DRCW      DRCW      DRCW      DRCW      DRCW
DRCWDACT  DRCWEUSG  DRCWSAT   DRCWSAT2  DRCWSDEN

REGISTER 10 REGISTER 11 REGISTER 12 REGISTER 13 REGISTER 14
DRCW      DRCW      DRCW      DRCW      DRCW
DRCWSBLK  DRCWRING  DRCWTATT  DRCWTOVF  DRCWUNIV

REGISTER 15 REGISTER 16 REGISTER 17
DRCW      DRCW      DRCW
DRCWDENY  DRCWAUNV  DRCWDUNV

RECORD_ID  KEY      INFO
0
    
```



---

**Preserve EADAS Data Over SW Application-U.S. only** (continued)

---

In the following example, the EADASKEY command deletes EADAS transmission records for the EADAS30M class.

```
> EADASKEY EADAS30M 2 DELETE 9  
> EADASKEY EADAS30M 2 DELETE 10  
> EADASKEY EADAS30M 2 DELETE 11  
> EADASKEY EADAS30M 2 DELETE 12  
> EADASKEY EADAS30M 2 DELETE 13  
> EADASKEY EADAS30M 2 DELETE 14  
> EADASKEY EADAS30M 2 DELETE 15
```

In the following example, the EADASFMT command displays the EADAS30M class registers deleted when entry of the EADASKEY command occurs.

**Preserve EADAS Data Over SW Application-U.S. only** (continued)

**> EADASFMT EADAS30M 2**

CLASS: EADAS30M      PRECISION: SINGLE      SECTION ID: 2      PRECISION: SINGLE

REGISTER 0	REGISTER 1	REGISTER 2	REGISTER 3	REGISTER 4
RECORD ID	ANN	ANN	ANN	ANN
NUMBER	ANNATT	ANNOVFL	ANNTRU	ANNSBU

REGISTER 5  
ANN  
ANNMBU

RECORD_ID	KEY	COMMON_LANGUAGE_NAME	INFO	ANN_OMINFO
0	ACTSTOPS		1	
1	BLDNANNC		30	
2	NCRTANNC		30	
3	CAP_KSMOH		10	
4	MCCSTOPS		1	
5	MSCAANNC		30	
6	MSLCANNC		30	
7	PSPDANNC		30	
8	ROHANNC		30	

**Translations table flow**

Preserve EADAS Data Over SW Application-U.S. only does not affect translations table flow.

**Limits**

Preserve EADAS Data Over SW Application-U.S. only does not have limits.

**Interactions**

Preserve EADAS Data Over SW Application-U.S. only does not have functionality interactions.

---

## Preserve EADAS Data Over SW Application-U.S. only (continued)

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### Activation/deactivation by the end user

Preserve EADAS Data Over SW Application-U.S. only does not require end user activation or deactivation.

### Billing

Preserve EADAS Data Over SW Application-U.S. only does not affect billing.

### Station Message Detail Recording

Preserve EADAS Data Over SW Application-U.S. only does not affect Station Message Detail Recording.

### Datafilling office parameters

Preserve EADAS Data Over SW Application-U.S. only does not affect office parameters.

### Datafill sequence

The table that requires datafill to implement Preserve EADAS Data Over SW Application-U.S. only appears in the following table.

#### Datafill requirements for Preserve EADAS Data Over SW Application-U.S. only

Table	Purpose of table
EADAS	Engineering and Administrative Data Acquisition System. This table stores site EADAS data to allow this data to be preserved over an ONP.

### Datafilling table EADAS

The primary function of table EADAS is to transfer EADAS collection descriptions from the old load to the new load. The transfer occurs during an ONP. Operating companies can also use this table to provide the same functionality as the EADSECTS, EADASKEY, and EADASFMT commands.

*Note:* The system automatically enters data in table EADAS during an ONP. The first jobs and sites that receive EADAS software for the first time must manually add their EADAS collection descriptions.

Datafill for Preserve EADAS Data Over SW Application-U.S. only for table EADAS appear in the following table. The fields that apply to Preserve

**Preserve EADAS Data Over SW Application-U.S. only** (continued)

EADAS Data Over SW Application-U.S. only appear in this table. See the data schema section of this document for a description of other fields.

**Datafilling table EADAS**

Field	Subfield or refinement	Entry	Explanation and action
EADASKEY			EADAS Key. This field contains subfields CLASS, SECTION, and ITEM.
	CLASS	EADAS30M, EADAS60M, EADAS24H	OM Class. This subfield specifies the OM class. Enter EADAS30M (30-minute OM class), EADAS60M (60-minute OM class), or EADAS24H (24-hour OM class).
	SECTION	0-254	Section Number. This subfield specifies the EADAS section number.
	ITEM	PRECISION, `REG, KEY	Item. This subfield specifies the OM tuple type. Enter one of the following: <ul style="list-style-type: none"> <li>• PRECISION (in this event, subfield ITEM does not require additional datafill)</li> <li>• REG followed by one space and the register number (a value from 0 to 127)</li> <li>• KEY followed by one space and the OM tuple</li> </ul>
EADASDATA			EADAS Data. This field contains the EADAS data. Enter one of the following: <ul style="list-style-type: none"> <li>• If subfield ITEM of field EADASKEY is set to PRECISION, enter the following: <ul style="list-style-type: none"> <li>— SINGLE (single precision, specifying a count of up to 32,768) or DOUBLE (double precision, which specifies a count a maximum of 65,536)</li> <li>— the OM group name and OM field (register) name, separated by spaces</li> </ul> </li> <li>• If subfield ITEM of field EADASKEY is set to REG, enter the OM group name and OM field (register) name. Separate the names with spaces.</li> <li>• If subfield ITEM of field EADASKEY is set to KEY, enter PRESENT or DELETED.</li> </ul>

---

**Preserve EADAS Data Over SW Application-U.S. only (end)**


---

**Datafill example for table EADAS**

Sample datafill for table EADAS appears in the following example. All three types of EADAS data appear in this example.

EADASKEY			EADASDATA		
-----			-----		
EADAS30M	250	REG 12	BLDNANNC	250	
EADAS60M	166	PRECISION	SINGLE	SLEENG1	166
EADAS24H	253	KEY DRCW	PRESENT		

**Tools for verifying translations**

Preserve EADAS Data Over SW Application-U.S. only does not use tools for verifying translations.

**SERVORD**

Preserve EADAS Data Over SW Application-U.S. only does not use SERVORD.

## Random Conditional Routing

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS14 and later versions

### Requirements

This document includes all the datafill information for this functionality. The system can require software or hardware for complete implementation.

### Description

Random Conditional Routing distributes calls among several trunks in a method other than the numeric sequence of the trunks. The start of equal access improves call distribution. Even distribution of calls among long-distance carriers improves call distribution. Operating companies can route specified percentages of calls to all common carriers serving the area. This distribution provides near-standard distribution.

The user selects routing tables. The user distributes the calls to the different common carriers that serve that area. Distribution can break down to the nearest one percent. Trunk group size determines distribution.

### Operation

The switch operator responsible for data entry in the routing tables works in the subselector. The switch operator enters the same information that time of day routing and other conditional routing selectors use. The switch operator can use several conditional routing options at the same time. The switch operator can use several types of conditional routing.

### Translations table flow

Random Conditional Routing does not affect translations table flow.

### Limits

Random Conditional Routing does not have limits.

### Interactions

The following paragraph describes the interactions between Random Conditional Routing and other functionalities.

---

## Random Conditional Routing (continued)

---

The system establishes this feature through a subselector of the calling number delivery (CND) and negative conditional branching (NOT) selectors. The NOT selectors are in the routing table. The system requires datafill for other conditional routing features. Interaction with any other routing feature is not present.

### Activation/deactivation by the end user

After you choose and install the feature for the subscriber, the subscriber must decide the route selection. You normally enter data for less expensive routes first. Random routing provides distribution. After routing distributes calls across the cheap trunks, expensive routes are affected. Call routing distribution can include expensive routes. The system applies an expensive route warning tone (ERWT) when the system routes calls through expensive trunks.

In offices with a normal traffic flow, the percentage for which you enter data varies with the number of calls the system routes. Variance is approximately 1 percent. The system uses proper route selection to distribute calls evenly to different common carriers on the trunk group size.

### Billing

Random Conditional Routing does not affect billing.

### Station Message Detail Recording

Random Conditional Routing does not affect Station Message Detail Recording.

### Datafilling office parameters

Random Conditional Routing does not affect office parameters.

### Datafill sequence

Datafill is the same for Random Conditional Routing as for other call routing features, like time of day routing. This feature uses the same selections for other routing options.

## Random Conditional Routing (continued)

Tables that require datafill to implement Random Conditional Routing appear in the following table. The tables appear in the correct entry order.

### Datafill requirements for Random Conditional Routing

Table	Purpose of table
IBNRTE	The IBN Route. This table contains route lists that a route reference index number identifies.
OFRT	Office Route. Use this table for routing. All DMS switches except DMS-300 use this table for routing.

### Datafilling table IBNRTE

Datafill for Random Conditional Routing for table IBNRTE appears in the following table. The fields that apply to Random Conditional Routing appear in this table. See the data schema section of this document for a description of the other fields.

#### Datafilling table IBNRTE

Field	Subfield or refinement	Entry	Explanation and action
RTELIST		see subfields	Route list. This field includes subfields IBNRTTSEL, CNDSEL, and PERCENT.
	IBNRTTSEL	CND	IBN route selector. This subfield specifies the IBN route selector CND. Enter CND.
	CNDSEL	RND	Condition selector. This subfield specifies the condition tested. Enter RND.
	PERCENT	0 to 100	Percent. This subfield specifies the percentage of calls affected. Enter a value from 0 to 100.

### Datafill example for table IBNRTE

Sample datafill for table IBNRTE appears in the following example. An equal distribution of calls between two trunk groups appears in this example.

Route element 1 sends 50 percent of all calls to route list 2. Route element 1 sends the rest of the calls to route list 3. Route list 2 tries to route over FRED first. If that route fails, route list 2 tries to route over JOHN. Route list 3 reverses the order of route list 2.



---

**Random Conditional Routing** (continued)

---

**MAP example for table IBNRTE**

RTE		RTELIST
1	(CND RND 50 ST 2)	(CND ALWAYS ST 3)
2	(S N N N FRED)	(S N N N JOHN)
3	(S N N N JOHN)	(S N N N FRED)

To extend route list 1 to distribute calls over more than two route lists, you must extend route list 1. You require an additional tuple or tuples. This condition appears in the following example.

**MAP example for table IBNRTE**

RTE		RTELIST
1	(CND RND 10 ST 2)	(CND RND 10 ST 3) (CND ALWAYS ST 4)
2	(S N N N FRED)	(S N N N JOHN) (S N N N PAUL)
3	(S N N N JOHN)	(S N N N FRED) (S N N N PAUL)
4	(S N N N PAUL)	(S N N N JOHN) (S N N N FRED)

The percentage the system displays is a percentage of the calls that have reached this position. For example, the second RND 10 routes 10 percent of calls the first RND 10 did not route. In absolute percentage, this percentage is only ten percent of 90 percent. Ten percent of 90 percent is nine percent.

To get even distribution among n route lists, you normally use fractions:  $1/n$ ,  $1/(n-1)$ ,  $1/(n-2)$  . . .  $1/(n-(n-2))$ ,  $1/(n-(n-1))$ . For example, if you use ten route lists, n would equal 10:  $1/10$ ,  $1/9$ ,  $1/8$  . . .  $1/2$ ,  $1/1$ . The system expresses these fractions as: 10%, 11%, 12% or 13%, 50%, 100% (always).

When you add datafill for Random Conditional Routing, the first tuple must not end with a CND RND item. This datafill causes calls to route to treatment. You must specify a routing alternative after the CND RND item, like, CND ALWAYS.

**Datafilling table OFRT**

Datafill for Random Conditional Routing for table OFRT appears in the following table. Only the fields that apply directly to Random Conditional

## Random Conditional Routing (end)

Routing appear. For a description of the other fields, refer to the data design section of this document.

### Datafilling table OFRT

Field	Subfield or refinement	Entry	Explanation and action
RTELIST		see subfields	Route list. This field includes many subfields. This feature only affects subfields CNDSEL and PERCENT.
	CNDSEL	RND	Condition selector. This subfield specifies the condition tested. Enter RND.
	PERCENT	0 to 100	Percent. This subfield specifies the percentage of calls affected. Enter a value from 0 to 100.

### Datafill example for table OFRT

Sample datafill for table OFRT appears in the following table.

When you add datafill for Random Conditional Routing, the first tuple must not end with a CND RND item. This datafill causes calls to route to treatment. You must specify a routing alternative after the CND RND item. The following example illustrates routing alternative specification.

### MAP example for table OFRT

RTE	RTELIST
<hr/> 219 (CND RND 50 ST 220) (N D S6S7EAPC7 0 N N) (N D S6S7EAP 0 N N) \$	

## Tools for verifying translations

Random Conditional Routing does not use tools for verifying translations.

## SERVORD

Random Conditional Routing does not use SERVORD.

---

## Remote Call Forwarding

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS34 and later versions

### Requirements

To operate, Remote Call Forwarding requires OAM BAS, OAM00001.

### Description

Feature package NTX021AA contains features that start Remote Call Forwarding (RCF). The RCF allows a subscriber to have a local directory number (DN) that automatically forwards calls to a station in another local calling area (remote station). The system transmits the local DN, called the RCF base DN, to the remote DN. The system bills the subscriber for the forwarded part of the call. The system bills the originating call to the RCF base DN to the caller. This action occurs if the originating call is not local.

### Remote Call Forwarding - LAMA (BC0351)

Feature BC0351 creates RCF in local automatic message accounting (LAMA) offices. The RCF calls use LAMA billing procedures. The system routes RCF calls with normal direct distance dialed (DDD) traffic over a common trunk group to the toll office. This feature affects the following tables.

### Table CFW

Earlier, Regular Call Forwarding (CFW) used table CFW. Feature BC0351 modifies to allow CFW and RCF to share the table. Table CFW defines the following:

- RCF base DN
- the forwarding DN
- type of call forwarding
- number of simultaneous calls
- the line attribute index to table LINEATTR

The data schema section of this document describes table CFW.

## Remote Call Forwarding (continued)

---

### Table RCFCLI

Feature BC0351 creates table RCFCLI to allow the calling line identification (CLI) function to be activated on an RCF base DN. The base DN is the DN that forwards the call. The CLI function, when activated on a local DN, generates log report TRK163 when a caller dials the DN. Log report TRK163 identifies the DN of the calling party and the outgoing trunk group. Log report TRK163 identifies the called DN, and the date and time. To activate a CLI function on an RCF base DN, specify the serving numbering plan area (SNPA) and the local DN in table RCFCLI. The system activates on an RCF base DN. The data schema section of this document describes table RCFCLI.

Feature BC0351 creates two office parameters. The two office parameters separate the initialization of plain ordinary telephone service (POTS) CFW and Meridian Digital Centrex (MDC) CFW. This action allows MDC loads to initialize MDC CFW without getting POTS CFW.

If set to Y, office parameter IBN\_CFW in table OFCOPT allows the system to activate CFW in an MDC office. If set to Y, parameter POTS\_CFW allows CFW in offices with POTS customer calling features. *Office Parameters Reference Manual* describes Table OFCOPT parameters.

### Service Order for RCF (BC0514)

Feature BC0514 allows you to assign or remove RCF from a DN with the use of Service Order System (SERVORD) commands. You can assign RCF to a DN with the NEWDN command. You can remove RCF from a DN with the OUTDN command. These two commands automatically update table DNINV and table CFW. The data schema section of this document describes tables DNINV and CFW. The *SERVORD Reference Manual* describes SERVORD commands.

Feature BC0514 creates SERVORD commands to apply RCF or remove RCF from a local DN. Use the NEWDN command when you apply RCF to a local DN. Use the OUTDN command to remove RCF from a base DN.

Feature BC0514 creates the parameter SO\_RCF in table OFCOPT. This creation determines if you can assign or remove RCF from a base DN with SERVORD commands. If you set parameter SO\_RCF to Y, you can assign or remove RCF with the SERVORD commands. If you set parameter SO\_RCF to N, you cannot assign or remove RCF. The *Office Parameters Reference Manual* describes table OFCOPT parameters associated with feature package NTX021AA.

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**Remote Call Forwarding (continued)**

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**Remote Call Forwarding - CAMA (BR0323)**

Feature BR0323 creates RCF in centralized automatic message accounting (CAMA) offices. The RCF calls use CAMA billing procedures. The RCF routes over a specified trunk group, separate from DDD traffic, to the toll office. Only RCF calls use this CAMA trunk group. The operating company defines this CAMA trunk group.

**RCF Enhancements (BR0505)**

Feature BR0505 provides offices without LAMA with the capability to route RCF calls over dedicated or combined trunk groups to toll offices. The toll offices have Bell CAMA or North AMR4/5 billing systems. The RCF calls can route over trunk groups that support wink automatic number identification (ANI) requests. This routing allows the system to pass answer supervision back to the originating office. Answer supervision must propagate to the originating office. The bill for the first leg of the call can apply to the caller. The first leg of the call is the originating call to the RCF base DN. If the system uses a trunk group that does not support wink ANI requests to route a call, the system propagates a false answer. The system propagates a false answer to the originating office. This propagation can result in billing that is not correct.

The trunk group types that support wink ANI requests are:

- two-way or outgoing from local to North Electric AMR5 (A5)
- two-way or outgoing from local to CAMA (operating company [OC])
- outgoing or two-way to TOPS or Traffic Service Position System (TSPS) (OP)

Trunk group types appear in table TRKGRP. Table TRKGRP appears in the data schema section of this document.

Feature BR0505 modifies table CFW to include field RTEORSCR. Feature BR0505 allows an RCF call to route with an office route index (OFRTINDEX) or with screening class (SCRNCL). If RTE is entered in field RTEORSCR, the route reference number assigned to the route list is entered in field OFRTINDEX. Field OFRTINDEX is in table CFW. If SCR is entered in field RTEORSCR, the screening class subtable name is entered in field SCRNCL of table LINEATTR.

The ability to specify a screening class subtable (SCRNCL) allows more flexibility than with the office route index (OFRTINDEX). Only offices without LAMA can use the office route index. The LAMA offices and offices without LAMA can use the screening class subtable entry.

## Remote Call Forwarding (continued)

---

Feature BR0505 modifies table TRKGRP to allow OP trunks to signal true answer supervision (support wink ANI). The system creates field ANITYPE to allow for a reversal or wink ANITYPE. For Bell Standard offices, this field must contain REV (reversal). In conditions with special requirements (RCF), ANITYPE must contain WK (wink). The data schema section of this document describes table TRKGRP

Feature BR0505 creates the office parameter TEST\_CALL\_AMR\_SPILL in table OFCVAR. This parameter is a requirement. The ANI spill format for A5 trunks is different from the ANI spill for OC-type trunks. When you place a test call, provide the appropriate ANI spill. Office parameter TEST\_CALL\_AMR\_SPILL must contain the test call billing number. The number includes the category digits a test call requires. The *SERVORD Reference Manual* describes table OFCVAR.

Feature BR0505 creates the operational measurements (OM) group RCF. The OM group RCF contains registers to record the number of RCF attempts, RCF calls in progress, and RCF failures. Collection of these OMs can occur for a maximum of 128 RCF base DNs. You can specify the OM index when you apply RCF to a local DN with the NEWDN command. The following page and the *SERVORD Reference Manual* describes the NEWDN command. *Operational Measurements Reference Manual* describes OM group RCF.

Table CFW contains call forwarding data for CFW and RCF. Modification of table CFW associates a line attribute in table LINEATTR with an RCF base DN or equal access Remote Call Forwarding (RCFEA) base DN. For RCF base DNs, this association occurs according to the MRSA and the line treatment group (LTG) specified with the NEWDN command. For RCFEA base DNs, the line attribute and DN association occurs according to the LATA name (LATANM) and pretranslator name (PRTNM) specified with the NEWDN command.

The removal of the class of service screening table name (SCRNCL) and pretranslator name (PRTNM) fields occurs from table CFW. Table LINEATTR defines tables SCRNCL and PRTNM. For RCFEA, the removal of the LATA name (LATANM) field occurs. Table LINEATTR defines the LATANM field. The data schema section of this document describes table CFW.

Table LINEATTR defines line attributes lines in the switching unit use. The system assigns each line a line attribute that table LINEATTR defines.

---

## Remote Call Forwarding (continued)

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### RCF Enhancements (AQ1245)

This enhancement to RCF passes the RCF number in the call forward data to the next signalling link for a remote call. This enhancement applies to call forwarding that involves either:

- CCS7 ANSI ISDN User Part (ISUP) trunks
- lines supported by a simplified message desk interface (SMDI) data link

The RCF Enhancements feature requires software optionality control (SOC) using SOC RES00020. The enhancement passes the original called number (OCN) and the redirecting number (RGN) as the called data for ISUP trunks and the forwarding from number and the type of forwarding information as the called data for SMDI data links.

A response of RCF to the DNTYPE prompt in SERVORD generates a SIGDATA prompt. A SIGDATA response of Y (yes), enables the RCF Enhancements feature. A response of N (no) disables the RCF Enhancements feature. Refer to the SERVORD section of this document for a detailed description for adding RCF to a DN.

The SMDI link datafill in the SLLNKDEV table determines the SMDI forwarding from number. If the LASTFWDN option in the SLLNKDEV table is datafilled, the SMDI sends the RCF DN as the called number if the RCF DN is either:

- the last forwarding number in the call chain
- the only called number in the call chain

If the LASTFWDN option in the SLLNKDEV table is not datafilled, the SMDI sends the RCF DN as the called number if the RCF DN is either:

- the first forwarding number in the call chain
- the only called number in the call chain

To understand the RCF Enhancements feature, an originator (621-1234) dials an RCF number (777-1000) that forwards to a voice mail system with SMDI messaging. Without the RCF Enhancements feature, the originator's DN (621-1234) passes on to the SMDI as the calling number (CGN). With the RCF Enhancements feature, the dialed RCF number (777-1000) passes on to the SMDI as the CGN.

### Message Rate Remote Call Forwarding Base DN (BR0815)

Feature BR0815 produces multiunit message rate (MUMR) Bellcore AMA records for RCF lines. Before BR0815, RCF no-prefix (NP) calls were billed on a flat-rate basis. Feature BR0815 provides usage-sensitive subscriber

## Remote Call Forwarding (continued)

---

billing. The system bills each call the RCF feature forwards to a local DN. Bills depend on the distance called, call duration, time of day, day of the week, and date. The system generates a MUMR record for a call when the RCF-to-terminator part of the call is NP. Direct dial or equal access billing records override MUMR records when the system prefixes the call.

Feature BR0815 creates a line class code (LCC) to add to the list of LCCs table LINEATTR accepts. Use a LCC of virtual line (VLN) for all RCF lines. Equipment is not present for RCF base DNs. The data schema section of this document describes table LINEATTR.

### Operation

This section describes the operations of the RCF feature in the DMS switch when the features are active. Descriptions include:

- hardware and software activity
- interface operations
- automatic DMS switch actions
- actions that require manual interaction

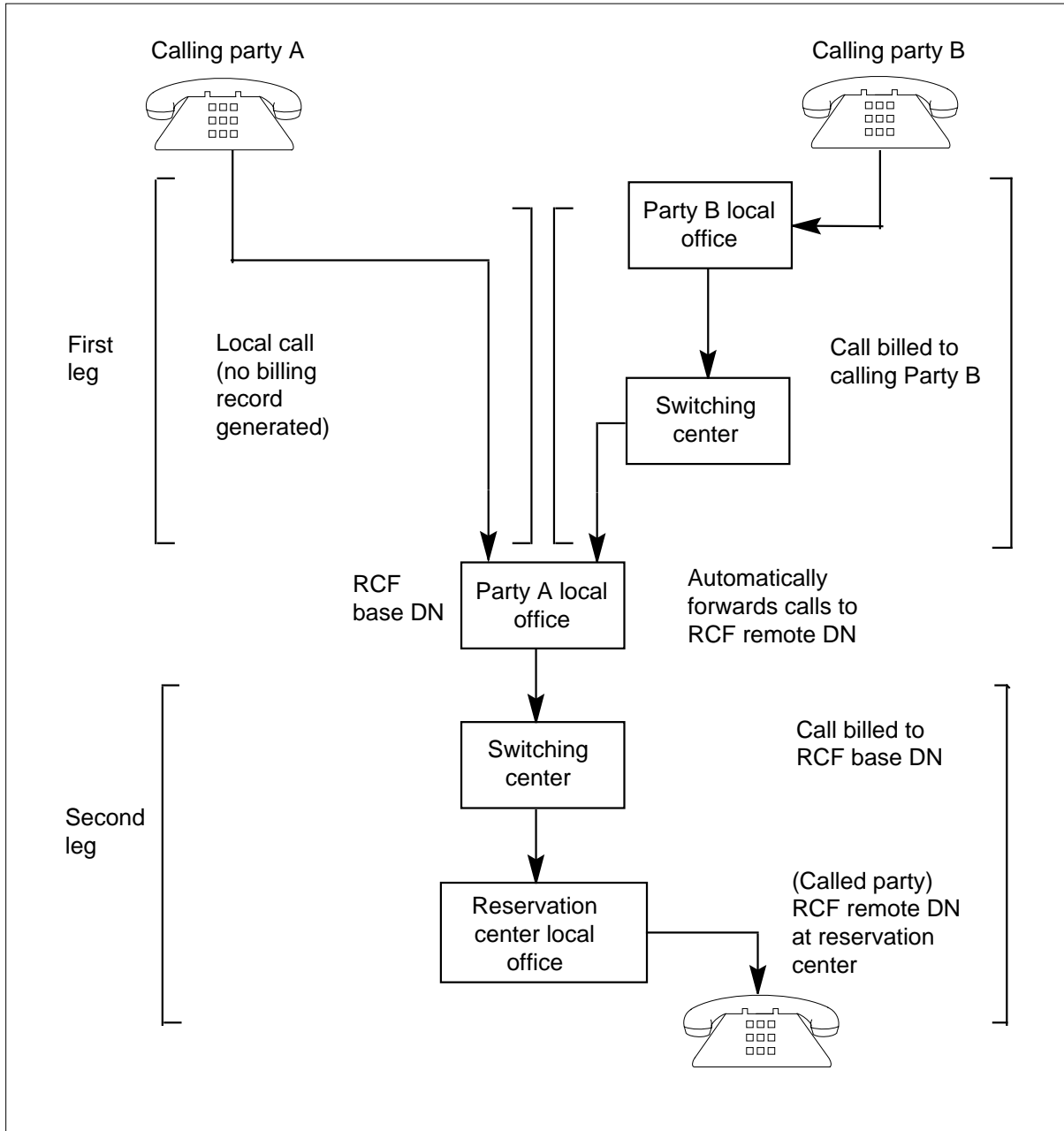
The RCF allows a subscriber to have a local DN (base DN) that automatically forwards calls to a remote station (remote DN). The RCF base DN is software-defined only. The base DN does not have associated hardware, a telephone, and permanently forwards calls to the remote DN. The system bills the subscriber for the forwarded part of the call. The one use of RCF appears in the following example.

A reservation center in a remote city can use RCF for the customers of the center. Without RCF, a customer receives a bill for a direct call to the reservation center. The RCF allows the reservation center to have a local DN that forwards calls to the reservation center in the remote city. The call is free to the customer because the customer dials a local DN. The reservation center receives a bill for the forwarded part (second leg) of the call. If the customer call to the RCF base DN is not a local call, the system bills the customer for that part of the call. The RCF base DN is the first leg of the call. This condition appears in the following figure.



**Remote Call Forwarding (continued)**

**Remote Call Forwarding example**



Party A, in the preceding figure, calls the RCF base DN. When this action occurs, the system forwards the call to the RCF remote DN at the reservation center. The call is free to party A because the first leg of the call is a local call. The system bills the RCF base DN for the second leg of the call to the RCF remote DN.

## Remote Call Forwarding (continued)

---

If party B calls the RCF base DN, the system bills party B for the first leg of the call. The RCF base DN is not local for party B. The system bills the RCF base DN for the second leg of the call to the RCF remote DN.

### Remote Call Forwarding and regular Call Forwarding

RCF differs from regular CFW in the following ways:

- RCF base DN's do not have hardware.
- RCF remains active at all times.
- The subscriber cannot change the forwarding number (RCF remote DN). Datafill can only change the forwarding number.
- Simultaneous calls can be active between the RCF base DN switching office and the RCF remote DN.

The system generates MUMR Bellcore AMA records when the forwarded part of a call is no-prefix (NP). The system generates the message rate service area (MRSA) defined for the RCF DN is not NIL. Direct dial or equal access billing records override MUMR records when the forwarded part of a call is not NP.

### Activating RCF

Table LINEATTR must contain a line attribute for an RCF line before the system can assign an RCF base DN. Table LINEATTR contains a MRSA name if you want MUMR billing records. For equal access or direct dial billing records, specify a NIL MRSA to avoid problems. You can specify an MRSA because equal access or direct dial billing records override MUMR billing records.

Each entry for RCF lines in table LINEATTR must have a VLN line class code. The RCF base DN's do not have hardware. The data schema section of this document describes table LINEATTR.

The NEWDN command in SERVORD assigns RCF to a local DN. The NEWDN command defines the RCF base DN and RCF remote. The system automatically updates table CFW to reflect call forwarding data you specify with the NEWDN command. When table CFW automatically associates a line attribute, table LINEATTR defines with the RCF base DN. The data schema section of this document describes table CFW.

During a NEWDN command the system treats the second leg of an RCF call as direct dial when the following conditions occur:

- MRSA is NIL and for an RCF DN
- specification of routing occurs for the RTEORSCR prompt

---

## Remote Call Forwarding (continued)

---

The *SERVORD Reference Manual*. defines the NEWDN command

### How to activate calling line identification

The CLI function generates log report TRK163 when you dial an RCF base DN. The log report identifies the calling party DN, the outgoing trunk group, the RCF base DN, and the date and time. Activation of the CLI function occurs on an RCF base DN with entry of the RCF base DN in table RCFCLI. The data schema section of this document describes Table RCFCLI. The *Log Report Reference Manual*. describes log TRK163.

The OUTDN command in SERVORD removes RCF from a local DN. The CDN command changes data that associates with an RCF base DN. These commands automatically update tables CFW and DNINV. The data schema section of this document describes table DNINV. The *SERVORD Reference Manual* describes the OUTDN and CDN commands

### Translations table flow

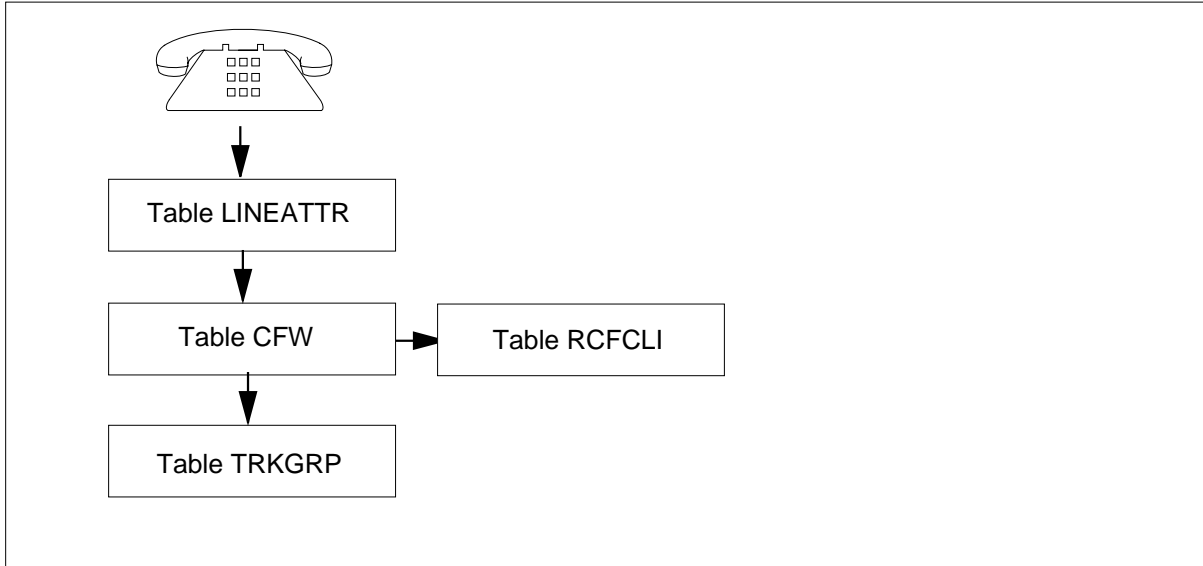
The Remote Call Forwarding translations tables appear in the following list:

- Table LINEATTR determines the indexing to screening tables and first defines the type of line that generates the call.
- Table CFW allows a subscriber to have incoming calls to a station automatically forwarded to a known telephone number.
- Table RCFCLI contains a maximum of eight that serve NPAs and DNs of the base station. The NPAs and DNs are for a remote call forwarding line with the calling line identification option.
- Table TRKGRP defines data for each trunk group in the switching unit.

The Remote Call Forwarding translation process appears in the following flowchart.

## Remote Call Forwarding (continued)

### Table flow for Remote Call Forwarding



The datafill content the flowchart uses appears in the following table.

### Datafill example for Remote Call Forwarding

Item	Example data
Base number	(613) 621-1234
Forwarded to	1-613-225-4983

### Datafill example for Remote Call Forwarding

Datafill table	Example data
LINEATTR	0 VLN NONE NT FR01 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 0 NIL NIL 00 N
CFW	0 REM R 613 6211234 16132254983 SCR 2 0 N UNDT 0 N Y
RCFCLI	2 613 2254983
TRKGRP	DMODEMC OP 0 TLD NCRT NIL MIDL COMB MIX REV TERMHOLD N OG Y N N

---

## Remote Call Forwarding (continued)

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### Limits

The following limits apply to Remote Call Forwarding:

- The maximum number of simultaneous calls (MAXCALLS) you can specify for an RCF DN is 511. The NEWDN command specifies MAXCALLS for an RCF DN.
- When you assign RCF forwarding DN's, the forwarding DN specified with the NEWDN command must be seven or ten digits long. The RCF base DN must be seven digits.

### Interactions

Remote Call Forwarding does not have functionality interactions.

### Activation/deactivation by the end user

Remote Call Forwarding does not require activation or deactivation by the end user.

### Billing

Remote Call Forwarding affects billing. The following sections describe how Remote Call Forwarding affects billing.

#### Remote Call Forwarding billing procedures

The RCF LAMA offices use LAMA billing procedures. The system treats RCF calls as direct distance dialed (DDD) traffic. The system routes RCF calls over a common trunk group to the toll office. For CAMA offices, RCF calls use CAMA billing procedures. Route RCF calls over a dedicated trunk group to the toll office.

#### Remote Call Forwarding billing records

The system generates MUMR billing records for the second leg of RCF calls that are NP calls. With MUMR billing, the system bills the second leg of a call. Billing depends on the distance, call duration, time of day, day of the week, and date. Message-rate service divides the local calling area in service areas. The system bills a call according to the service area where the call terminates. Table MRSANAME defines MRSAs the switch serves. The data schema section of this document describes table MRSANAME.

RCF no-prefix calls produce MUMR Bellcore AMA billing records. Table MUMRMBI defines sets of call billing attributes. The call billing attributes determine call code records that calls generate. Table MUMRTAB assigns a set of calling attributes in table MUMRMBI to each MRSA table that MRSANAME defines. The call codes that RCF calls generate are 001, 002,

## Remote Call Forwarding (continued)

---

003, 004, and 005. The data schema section of this document defines tables MUMRMBI and MUMRTAB.

Direct dial or equal access billing records can override MUMR billing records. This action occurs when the second leg of a call is a prefix call.

Feature BR0815 allows the system to bill RCF calls on a message-rate basis. Message-rate service divides the local calling area in service areas. The rate the system bills a subscriber for an RCF call depends on the MRSA where the call terminates. Table MRSANAME defines the MRSA the switching unit serves.

The RCF calls that are NP produce MUMR call codes 001, 002, 003, 004, and 005. The billing attributes defined in table MUMRMBI determine the call code record an NP call generates. Table MUMRTAB associates MRSA with billing attributes that table MUMRMBI defines. Refer to the *Bellcore Format Automatic Message Accounting Reference Guide, 297-1001-830*, for additional information on Bellcore AMA format and call codes.

The data schema section of this document describes tables MRSANAME, MUMRMBI, and MUMRTAB.

## Station Message Detail Recording

Remote Call Forwarding does not affect Station Message Detail Recording.

## Datafilling office parameters

The office parameters Remote Call Forwarding uses appears in the following table. The table describes the office parameters and data tables to datafill for Remote Call Forwarding to activate in a switch. Refer to the *Office Parameters Reference Manual for additional information on office parameters*.

### Office parameters by Remote Call Forwarding (Sheet 1 of 2)

Table name	Parameter name	Explanation and action
OFCOPT	POTS_CFW	The parameter specifies if the CFW feature is available in a POTS office.
OFCOPT	IBN_CFW	The parameter specifies if the CFW feature is available. If set to Y, all MDC lines, business sets, and MDC and POTS data lines activate to CFW.

## Remote Call Forwarding (continued)

### Office parameters by Remote Call Forwarding (Sheet 2 of 2)

Table name	Parameter name	Explanation and action
OFCOPT	SO_RCF	This parameter specifies if you can use SERVORD to assign or remove the RCF feature from an RCF base DN. If set to Y, you can use SERVORD commands to assign or remove RC. If set to N, you cannot assign or remove RCF with SERVORD.
OFCVAR	TEST_CALL_AMR_SPILL	This parameter must contain the test call billing number and category digits when making a test call. Enter the test call billing number. The ANI spill for the two-way or outgoing from local to North Electric AMR5 (A5) trunk group type is different. The trunk group type is different than the ANI spill for the two-way or outgoing from local to CAMA (OC) trunk group type.

### Datafill sequence

The tables that require datafill to implement Remote Call Forwarding appear in the following table. The tables appear in the correct entry order.

### Datafill requirements for Remote Call Forwarding (Sheet 1 of 2)

Table	Purpose of table
OFCOPT	Office Option. This table contains data to engineer options for the office. Refer to <i>Office Parameters Reference Manual</i> for how Remote Call Forwarding affects office parameters.
OFCVAR	Variable Office Parameter. This table contains data on different office parameters for the office. Refer to <i>Office Parameters Reference Manual</i> for how Remote Call Forwarding affects office parameters.
LINEATTR	Line Attribute. This table assigns line attributes to MDC stations and attendant consoles.
CFW (note)	Regular and Remote Call Forwarding. This table allows a subscriber to have incoming calls to a station automatically forwarded to a predetermined DN.
<p><b>Note:</b> Enter data in this table through SERVORD. Datafill procedure or example is not available. Refer to the SERVORD section for an example of how to use SERVORD to enter this table.</p>	

## Remote Call Forwarding (continued)

### Datafill requirements for Remote Call Forwarding (Sheet 2 of 2)

Table	Purpose of table
RCFCLI (note)	Remote Call Forwarding Calling Line Identification. This table lists a maximum of eight SPNAs and DNs of the base station. These SPNAs and DNs are for a remote call forwarding line with the calling line identification (CLI) option.
TRKGRP (group type OP)	Trunk Group. This table contains information about trunk groups. This table defines data for each trunk group in the switching unit.
<b>Note:</b> Enter data in this table through SERVORD. Datafill procedure or example is not available. Refer to the SERVORD section for an example of how to use SERVORD to enter this table.	

### Datafilling table LINEATTR

Datafill for Remote Call Forwarding for table LINEATTR appears in the following table. The fields that apply to Remote Call Forwarding appear in this table. See the data schema section of this document for a description of the other fields.

#### Datafilling table LINEATTR

Field	Subfield or refinement	Entry	Explanation and action
LCC		VLN	Line class code. Enter VLN for virtual line.

#### Datafill example for table LINEATTR

Sample datafill for table LINEATTR appears in the following example.

#### MAP example for table LINEATTR

```

LNATTIDX LCC CHGCLSS COST SCRNL LGT STS PRTNM LCCANAME
ZEROMPOS TRAFSNO
MRSA SFC LATANM MDI IXNAME DGCLNAME FANIDIGS
RESINF OPTIONS
-----
0 VLN NONE NT FR01 0 613 P621 L613
TSPS 10
NIL NILSFC LATA1 0 NIL NIL 00
N $
    
```

For BCS34 and later versions, removal and position of fields LCABILL and HOT in table LINEATTR occurs. Fields LCABILL and HOT become options in the options field.



**Remote Call Forwarding** (continued)

**Datafilling table TRKGRP (group type OP)**

Datafill for Remote Call Forwarding for table TRKGRP (group type OP) appears in the following table. The fields that apply to Remote Call Forwarding appear in this table. See the data schema section of this document for a description of the other fields,.

**Datafilling table TRKGRP (group type OP)**

Field	Subfield or refinement	Entry	Explanation and action
GRPINFO		see subfields	Variable group data. This field contains subfields. This feature affects subfields GRPTYP and ANITYPE.
	GRPTYP	OP	Group type. Enter the trunk group type OP.
	ANITYPE	REV or WK	ANI type. Enter REV (reversal or answer) for normal Bell Standards offices. Default datafill is REV. Enter WK for special requirements (RCF/TCF).

**Datafill example for table TRKGRP (group type OP)**

Sample datafill for table TRKGRP (group type OP) appears in the following example.

**MAP example for table TRKGRP (group type OP)**

```

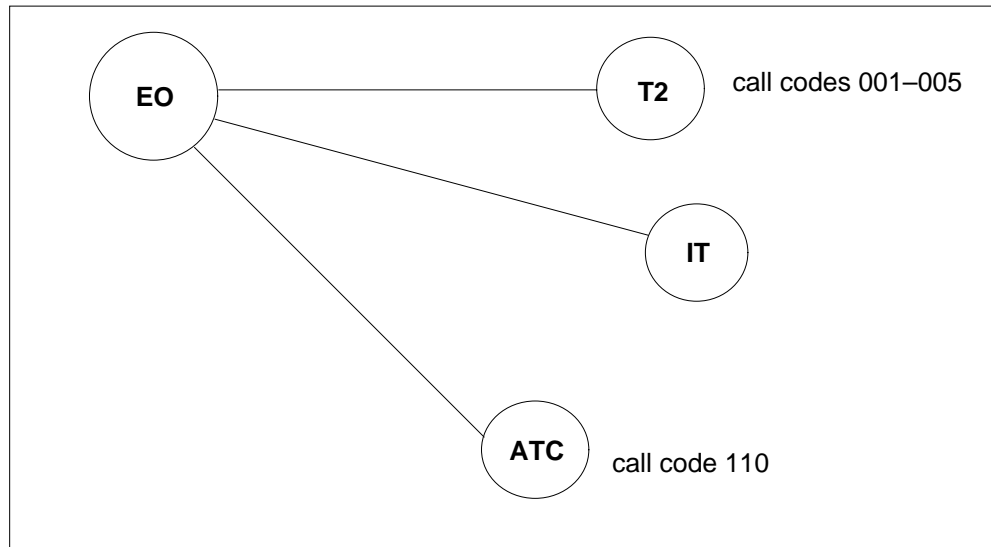
Table:  TRKGRP (group type OP)

GRPKEY                                     GRPINFO
-----
DMODEMC
OP 0  TLD  NCRT  NIL  MIDL  COMB  MIX  REV  TERMHOLD  N  OG  Y  N  N
    
```

Other trunk group types that apply to Remote Call Forwarding and several call codes the trunk group types produce appear in the following figure.

## Remote Call Forwarding (continued)

---



### Tools for verifying translations

Remote Call Forwarding does not use tools for verifying translations.

### SERVORD

The SERVORD contains commands that change subscriber line service tables. Feature package NTX021AA modifies or creates SERVORD commands to allow you to assign, remove, query, and change RCE DN data.

The NTX021AA affects the following SERVORD commands:

- NEWDN (new directory number)
- CDN (change directory number)
- OUTDN (out directory number)

Modification of the NEWDN command allows the command to prompt for additional information. Prompts for additional information occur when you assign RCF to a local DN. When you use the NEWDN command to assign RCF to a DN, the system issues additional prompts for an MRSA and an LTG. The BR0815 does not affect the information the system prompts for when you assign RCFEA to a DN.

The QDN (query directory number) command displays software information about a DN. Feature BR0815 modifies the information the QDN command provides. The QDN command information now includes the line attribute index for the queried RCF or RCFEA base DN.

---

## Remote Call Forwarding (continued)

---

The CDN (change directory number) command changes data that associates with a RCF base DN. Feature BR0815 creates additional prompts the system issues when you use the CDN command. The system issues prompts for an MRSA and an LTG when you change RCF base DN data. Feature BR0815 does not affect the CDN command for RCFEA base DNs.

Complete the datafill for the required table RCFCLI with SERVORD. Table RCFCLI (Remote Call Forwarding Calling Line Identification) contains a maximum of eight SNPAs and DNs of the base station. The SNPAs and DNs are for an RCF line with the CLI option.

Complete the datafill for the required table CFW with SERVORD. Table CFW allows a subscriber to have incoming calls to a station automatically forwarded to a predetermined DN.

### SERVORD limits

Remote Call Forwarding does not have SERVORD limits.

### SERVORD prompts

The SERVORD prompts the NEWDN command uses to assign the Remote Call Forwarding feature to a line appear in the following table.

#### SERVORD prompts for Remote Call Forwarding with the NEWDN command to assign RCF to a line (Sheet 1 of 2)

Prompt	Valid input	Explanation
SNPA	3 digits	Enter the serving numbering plan area.
BLOCK_OF_DNS	Y or N	Use to assign a block of DN or to assign the RCF feature. Enter Y for a block of DN. Enter N for one DN and RCF.
DN	7 digits (without spaces or hyphens)	Enter the DN associated with the service you establish, modify, or delete.
DNTYPE	RTE, RCF, LDN, or RCFEA	Use to assign a block of DN or for to assign the RCF feature. Enter RCF to assign the RCF feature.
FWD_DN	a maximum of 24 digits	Enter the DN where the system forwards calls on a fixed call forwarding option.

**Remote Call Forwarding** (continued)**SERVORD prompts for Remote Call Forwarding with the NEWDN command to assign RCF to a line (Sheet 2 of 2)**

Prompt	Valid input	Explanation
LTG	0 to 511	Enter the LTG number that the operating company determines.
MAXCALLS	0 to 511	Appears during assignment of the RCF feature. Enter the maximum number of simultaneous calls the system allows to the DN.
MRSA	alphabetic	Enter the message-rate service area of the remote station (forwarding DN).
BLK_TOLL_COM	Y or N	Specifies if the system forwards incoming toll calls to a remote station.
OM_INDEX	0-127	Enter the OM index.
RTEORSCR	RTE or SCR	Specifies route or screening class for a forwarded call. Enter RTE to assign route for a forwarded call.
BLK_TOLL_TREATMENT	see the data schema section of this document	Specifies the treatment the system gives to a blocked toll call.
OFRTINDEX	1 to 1023	Enter the office route index.
SIGDATA	Y or N	Yes specifies the requirements of remote call forward signaling enhancements.

---

## Remote Call Forwarding (continued)

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The SERVORD prompts the NEWDN command uses to assign the Remote Call Forwarding feature to a DN appears in the following table. The DN uses screening to route the call to the remote station.

### SERVORD prompts for Remote Call Forwarding with NEWDN command to assign RCF to a DN (Sheet 1 of 2)

Prompt	Valid input	Explanation
SNPA	3 digits	Enter the serving numbering plan area.
BLOCK_OF_DNS	Y or N	Use to assign a block of DN or for to assign the RCF feature. Enter Y for a block of DN. Enter N for one DN and RCF.
DN	7 digits (without spaces or hyphens)	Enter the DN for the service the system you establish, modify, or delete.
DNTYPE	RTE, RCF, LDN, or RCFEA	Use to assign a block of DN or for the assignment of the RCF feature. Enter RCF to assign the RCF feature.
FWD_DN	a maximum of 24 digits	Enter the DN where the system forwards calls on a fixed call forwarding option.
MAXCALLS	0 to 511	Appears during assignment of the RCF feature. Enter the maximum number of simultaneous calls the system allows you to modify, or delete to the DN.
LTG	0 to 511	Enter the LTG number the operating company determines.
MRSA	alphabetic	Enter the message-rate service area of the remote station (forwarding DN).
BLK_TOLL_COM	Y or N	Specifies if the system forwards incoming toll calls to a remote station.

## Remote Call Forwarding (continued)

### SERVORD prompts for Remote Call Forwarding with NEWDN command to assign RCF to a DN (Sheet 2 of 2)

Prompt	Valid input	Explanation
BLK_TOLL_TREATMENT	see the data schema section of this document	Specifies the treatment the system gives to a blocked toll call.
OM_INDEX	0 to 127	Enter the OM index.
RTEORSCR	RTE or SCR	Specifies route or screening class for a forwarded call. Enter RTE to assign route for a forwarded call.
SIGDATA	Y or N	Yes specifies the requirement of remote call forward signaling enhancements.

The SERVORD prompts the CDN command uses to assign Remote Call Forwarding to a line appears in the following table.

### SERVORD prompts for Remote Call Forwarding (Sheet 1 of 2)

Prompt	Valid input	Explanation
OLD_DN	see DN	Enter the DN that a new DN replaces.
NEW_DN	7 digits	Enter the DN that replaces the DN a CDN order changes.
INTERCEPT_NAME	BLDN	Specifies the type of intercept.
RCFTYPE	RCF or RCFEA	Specifies the type of Remote Call Forwarding. Enter RCF to assign Remote Call Forwarding.
FWDDN	a maximum of 24 digits	Enter the DN where the system forwards calls on a fixed call forwarding option.
MAXCALLS	0 to 511	Appears during the assignment of the RCF feature. Specifies the maximum number of simultaneous calls the system allows to the DN.

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**Remote Call Forwarding** (continued)

---

**SERVORD prompts for Remote Call Forwarding (Sheet 2 of 2)**

Prompt	Valid input	Explanation
LTG	0 to 511	Enter the LTG number the operating company determines.
BLK_TOLL_COM	Y or N	Specifies if the system forwards incoming toll calls to a remote station.
OM_INDEX	0 to 127	Enter the OM index.
RTEORSCR	RTE or SCR	Specifies route or screening class for a forwarded call. Enter RTE to assign route for a forwarded call.
SIGDATA	Y or N	Yes specifies the requirement of remote call forward signaling enhancements.

The *SERVORD* prompts the *OUTDN* command uses to assign Remote Call Forwarding to a line appears in the following table.

**SERVORD prompts for Remote Call Forwarding**

Prompt	Valid input	Explanation
SNPA	3 digits	Enter the serving numbering plan area.
BLOCK_OF_DNS	Y or N	Use to assign a block of DN or assign the RCF feature. Enter Y for a block of DN or N for one DN and RCF.
DN	7 digits (without spaces or hyphens)	Enter the DN that associates with the service you establish, modify, or delete.
DNTYPE	RTE, RCF, LDN, or RCFEA	Use to assign a block of DN or the assignment of the RCF feature. Enter RCF to assign the RCF feature.

The *SERVORD Reference Manual* describes all prompts that associate with *SERVORD* commands.

## **Remote Call Forwarding** (continued)

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### **SERVORD example for implementing Remote Call Forwarding**

You can use the NEWDN, CDN, and OUTDN commands to add Remote Call Forwarding to a DN. The addition of Remote Call Forwarding to a DN appears in the following SERVORD examples.

The NEWDN command assigns RCF to a DN. The assignment of Remote Call Forwarding to a DN appears in the following SERVORD example. The system uses an office route index (OFRTINDEX) to select a trunk group to the remote office.



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## Remote Call Forwarding (continued)

---

### SERVORD example for setting up Remote Call Forwarding with the NEWDN command in prompt mode

```

>SERVORD
SO:
>NEWDN
SONUMBER: NOW 85 7 6 AM
>
SNPA:
>613
BLOCK_OF_DNS:
>NO
Entry of NO is anticipated. Entry of YES is used for assignment of a block of DN.
DN:
>6211012
DN TYPE
>RCF
Entry of RCF is expected.
FWD_DN:
>6211013
MAXCALLS:
>2
LTG:
>0
MRSA:
>AREA1
BLK_TOLL_COM:
>N
BLK_TOLL_TREATMENT:
>UNDT
OM_INDEX:
>1
RTEORSCR:
>RTE
OFRTINDX:
>10
Used only in a non-LAMA office.
>Y

```

### SERVORD example for setting up Remote Call Forwarding with the NEWDN command in no-prompt mode

```
>NEWDN $ 613 NO 6211012 RCF 6211013 2 0 AREA1 N UNDT 1 RTE 10 Y
```

## Remote Call Forwarding (continued)

---

The assignment of Remote Call Forwarding to a DN appears in the following SERVORD example. The system uses screening to route the call to the remote station.

### SERVORD example for setting up Remote Call Forwarding with the NEWDN command in prompt mode

```
>SERVORD
SO:
>NEWDN
SONUMBER: NOW 86 01 15 PM
>
SNPA:
>613
BLOCK_OF_DNS:
>NO
DN:
>6214444
DNTYPE:
>RCF
FWD_DN:
>16661234
MAXCALLS:
>6
LTG:
>0
MRSA:
>AREA1
BLK_TOLL_COM:
>N
BLK_TOLL_TREATMENT:
>UNDT
OM_INDEX:
>12
RTEORSCR:
>SCR
SIGDATA:
>Y
```

### SERVORD example for setting up Remote Call Forwarding with the NEWDN command in no-prompt mode

```
>NEWDN $ 613 NO 6214444 RCF 16661234 6 0 AREA1 N UNDT 12 SCR Y
```

---

## Remote Call Forwarding (continued)

---

**Note:** The screening class (SCRNCL) subtable to use is in table LINEATTR. The data schema section of this document describes table LINEATTR.

The modification of Remote Call Forwarding data assigned to local (base) DN 621-0044 appears in the following SERVORD example. The local DN does not change. The new data assigned to the local DN appears.

### **SERVORD example for changing Remote Call Forwarding with the CDN command in prompt mode**

```
>SERVORD
SO:
>CDN
SONUMBER: NOW 87 10 15 PM
>
OLD DN:
>6210044
NEW_DN:
>6210044
INTERCEPT_NAME:
>BLDN
RCFTYPE:
>RCF
FWD_DN:
>6214440
MAXCALLS:
>3
LTG:
>2
MRSA:
>AREA1
BLK_TOLL_COM:
>N
BLK_TOLL_TREATMENT:
>UNDT
OM_INDEX:
>1
RTEORSCR:
>SCR
SIGDATA:
>Y
```

## Remote Call Forwarding (end)

---

**SERVORD example for changing Remote Call Forwarding with the CDN command in no-prompt mode**

```
>CDN $ 6210044 6210044 BLDN RCF 6214440 3 2 AREA1 N UNDT 1 SCR Y
```

The removal of Remote Call Forwarding from the base DN 621-5555 appears in the following SERVORD example.

**SERVORD example for removing Remote Call Forwarding with the OUTDN command in prompt mode**

```
>SERVORD
SO:
>OUTDN
SONUMBER: NOW 87 8 10 AM
>
SNPA:
>613
BLOCK_OF_DNS:
>NO
DN:
>6215555
DNTYPE:
>RCF
```

**SERVORD example for how to remove Remote Call Forwarding with the OUTDN command in no-prompt mode**

```
>OUTDN $ 613 NO 6215555 RCF
```

After you add, remove, or change the Remote Call Forwarding option, the QDN command reflects the change. Refer to the *SERVORD Reference Manual* for additional information of the QDN command.

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## SERVORD Enhancement for SLE

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

BCS34 and later versions

### Requirements

The SERVORD Enhancement for SLE does not have requirements.

### Description

This feature enhances the service order system (SERVORD) to provide the ability to add more than four directory numbers (DN) to a screening list. This action occurs with the creation of the SERVORD command CHL (change list). The CHL command modifies the CHF (change feature) command so that CHF does not manipulate a screening list of the Screening List Editing (SLE) feature.

The CHL command differs in the following three ways from the CHF command.

- The CHL allows the addition of a maximum of 20 DNs at a time to a SLE screening list. The CHF allows the addition of a maximum of 4 DNs at a time to a SLE screening list.
- The CHL allows the subscriber to add to, delete from, or change DNs in a SLE screening list.
- The CHL provides the ability to add DNs only to SLE screening lists. The CHF does not apply to non-SLE features.

The CHL command functions like the CHF command.

### Operation

The SERVORD Enhancement does not affect operation.

### Translations table flow

See "Translations data flow" in "Screening List Editing (SLE)" for information on the translations data flow for SLE.

## **SERVORD Enhancement for SLE (continued)**

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### **Limits**

The following limits apply to SERVORD Enhancement for SLE:

- This feature modifies the current CHF command so that this command does not manipulate screening lists. With this modification, the CHF command does not prompt for DNs. The CHF does not have the ability to add, delete, change, or replace entries in a screening list. The CHF provides the ability to change the billing option and status of a SLE feature.
- The CHL command currently affects the four SLE features. These features are Selective Call Acceptance (SCA), Selective Call Rejection (SCRJ), Selective Call Forwarding (SCF), and Distinctive Ringing/Call Waiting (DRCW).
- The operating company personnel set the maximum number of DNs allowed on an SLE feature screening list in Table RESOFC. This maximum can allow for more than 20 entries on a screening list. When this event occurs, a requirement can occur to execute the CHL command multiple times to use the maximum set. The number of current entries on the list determines if the entry of the CHL command must occur multiple times.
- The entry of the CHL command must occur for each type of change made to each screening list. For example, if a subscriber adds DNs to a list and changes other DNs, the entry of the command must occur twice. A subscriber can want to manipulate the screening list of more than one SLE feature on the same subscriber line. When this event occurs, the entry of this command must occur more than once.

### **Interactions**

The SERVORD Enhancement for SLE does not have functionality interactions.

### **Activation/deactivation by the end user**

See Activation/deactivation by the end user in Screening List Editing (SLE), for information on the activation and deactivation of SLE by the end user.

### **Billing**

The SERVORD Enhancement for SLE does not affect billing.

### **Station Message Detail Recording**

The SERVORD Enhancement for SLE does not affect Station Message Detail Recording.

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## SERVORD Enhancement for SLE (continued)

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### Datafilling office parameters

The SERVORD Enhancement for SLE does not affect office parameters.

### Datafill sequence

The SERVORD Enhancement for SLE feature does not affect datafill sequence.

### Tools for verifying translations

See "Tools for verifying translations" in Distinctive Ringing/Call Waiting (DRCW), for a TRAVER example of the SLE feature DRCW.

Refer to Verification tools in Selective Call Acceptance (SCA), for a TRAVER example of the SLE feature SCA.

Refer to Verification tools in Selective Call Forwarding (SCF), for a TRAVER example of the SLE feature SCF.

Refer to Verification tools in Selective Call Rejection (SCRJ), for a TRAVER example of the SLE feature SCRJ.

## SERVORD

After the subscriber enters the CHL command, the subscriber enters the SO number and the DN or line equipment number (LEN). The subscriber enters the SLE feature name, the billing information of the SLE feature, and the status of the SLE feature. The system presents the subscriber with three actions to choose from. These actions are A (add), D (delete), or C (change).

If the subscriber selects A (add), SERVORD prompts for a maximum of 20 DNs and the corresponding voiceback counts. The system can add these DNs to any current screening list. The system can place these DNs on a new list if a list was not present. With the A selector, SERVORD prompts the subscriber for DNs and VBCOUNT (voiceback count). A voiceback count is the number of digits that are voiced back during list review.

If the subscriber selects D(delete), SERVORD prompts for a maximum of 20 DNs. The system deletes these DNs from the current screening list. With the D selector, SERVORD prompts the subscriber for DNs.

If the subscriber selects C (change), SERVORD prompts for DN pairs. Each pair consists of an old DN and a new DN. With the new DN, a voiceback count is also a requirement. This sequence replaces a current DN on the list (old DN) with a new DN. You can repeat this sequence a maximum of nine times to change a total of a maximum of ten entries in a list. With the C selector,

## SERVORD Enhancement for SLE (continued)

SERVORD prompts the subscriber for OLD\_DN (old DN), NEW\_DN (new DN), and VBCOUNT.

### SERVORD limits

The following SERVORD limits apply to SERVORD Enhancement for SLE:

- to add a DN to a screening list that is full
- to delete a DN from a screening list that is empty
- to change a DN that is not present on a screening list

### SERVORD prompts

The SERVORD prompts to assign, delete, add, or change SERVORD Enhancement for SLE to or from a destination appear in the following table.

#### SERVORD prompts for SERVORD Enhancement for SLE (Sheet 1 of 2)

Prompt	Correct input	Explanation
DN_OR_LEN	Correct DN or LEN	Specifies the correct DN or line equipment number (LEN). Enter this number.
OPTION	SCA, SCRJ, DRCW, SCF	Indicates the modification with the execution of this command of the screening list, billing option, and/or status associated with the SLE.
BILLING_OPTION	NOAMA, AMA	The NOAMA indicates that the subscription determines the billing for the features. The AMA indicates that use determines the billing for the feature. For AMA, the system generates an AMA billing record for each SLE session.
STATUS	INACT, ACT	The INACT indicates that the feature is not turned on, inactive. The ACT indicates the feature is enabled, active.
ADD_DELETE_CHANGE	A, D, C	The A indicates DNs are added to an SLE screening list. The D indicates DNs are deleted from an SLE screening list. The C indicates current SLE screening list entries change. An example of this condition is to replace current entries with new entries.
DNS	10-digit directory number	Indicates the DN to add to or delete from the SLE feature screening list. The previous command determines if the addition or deletion of the DN occurs.



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**SERVORD Enhancement for SLE (continued)**


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**SERVORD prompts for SERVORD Enhancement for SLE (Sheet 2 of 2)**

Prompt	Correct input	Explanation
VBCOUNT	0 to 10	Indicates the number of digits to voice back during SLE list review. To enter 0 here marks the entry private. This entry indicates the entry is not voiced back.
DN_TO_CHANGE	10-digit DN	Indicates the old DN that is replaced when the entry of the C (change) command occurs.
DN_TO_ADD_OR_DELETE	10-digit DN	Indicates the new DN to replace the old DN when the C (change) command is entered.

**Using SERVORD Enhancement for SLE to add to a screening list**

The use of the SERVORD Enhancement for SLE feature to add DN's to a screening list appears in the following SERVORD example.

**SERVORD Enhancement for SLE to add to a screening list in prompt mode**

```

> SERVORD
SO:
> CHL
SONUMBER:   NO  91  9   19  PM
>
DN_OR_LEN:
> 6211233
OPTION:
> SCRJ
BILLING_OPTION:
> NOAMA
STATUS:
> ACT
ADD_DELETE_CHANGE:
> A
DN_TO_ADD_OR_DELETE:
> 6136215002
VBCOUNT:
> 7
DN_TO_ADD_OR_DELETE:
> $
COMMAND AS ENTERED:
CHL NOW 91 9 19 PM 6211233 SCRJ NOAMA ACT A (6136215002
7) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y

```

## SERVORD Enhancement for SLE (continued)

---

**SERVORD Enhancement for SLE to add to a screening list in no-prompt mode**

```
>CHL $ 6211233 SCRJ $ ACT A 6136215002 7 $ Y
```

### Using SERVORD Enhancement for SLE to delete from a screening list

How to use SERVORD Enhancement for SLE to delete DN's from a screening list appears in the following SERVORD example.

**SERVORD Enhancement for SLE to delete from a screening list in prompt mode**

```
>SERVORD
SO:
> CHL
SONUMBER: NOW 91 9 19 PM
>
DN_OR_LEN:
> 6211233
OPTION:
> SCRJ
BILLING_OPTION:
> NOAMA
STATUS:
> ACT
ADD_DELETE_CHANGE:
> D
DN_TO_ADD_OR_DELETE:
> 6136215002
DN_TO_ADD_OR_DELETE:
> $
COMMAND AS ENTERED:
CHL NOW 91 9 19 PM 6211233 SCRJ NOAMA ACT D (6136215002)
$
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y
```

**SERVORD Enhancement for SLE to delete from a screening list in no-prompt mode**

```
> CHL $ 6211233 SCRJ $ ACT D 6136215002 $
```

---

**SERVORD Enhancement for SLE (end)**


---

**Using SERVORD Enhancement for SLE to change a screening list**

How to use SERVORD Enhancement for SLE to change a screening list appears in the following SERVORD example.

**SERVORD Enhancement for SLE to change a screening list in prompt mode**

```

>SERVORD
SO:
> CHL
SONUMBER:  NOW  91  9  19  PM
>
DN_OR_LEN:
> 6211233
OPTION:
> SCRJ
BILLING_OPTION:
> NOAMA
STATUS:
> ACT
ADD_DELETE_CHANGE:
> C
DN_TO_CHANGE:
> 6136215001
NEW_DN:
> 6136212011
VBCOUNT:
> 7
DN_TO_CHANGE:
> $
COMMAND AS ENTERED:
CHL NOW 91 9 19 PM 6211233 SCRJ NOAMA ACT C (6136215001
(6136212011 7 ) ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> Y

```

**Using SERVORD Enhancement for SLE to change a screening list in no-prompt mode**

```

> CHL $ 6211233 SCRJ $ ACT C 6136215001 6136212011 7 $

```

## Talk Battery Alarm

---

### Ordering codes

Functional group ordering code: BAS00003

Functionality ordering code: does not apply

### Release applicability

DMSCCM04 and later versions

### Requirements

This document contains the datafill information for this functionality. This functionality can require software or hardware for complete implementation.

### Description

The Talk Battery Alarm feature provides periodic audits of each line concentrating module (LCM) shelf in an office. These audits are for talk battery presence.

### Operation

#### Background

Before this feature, reported loss of talk battery to an LCM shelf occurred if the talk battery fuse blew. If the loss of talk battery report does not occur, operating company personnel are not alerted that LCM subscriber lines cannot draw dial tone.

The Talk Battery Alarm feature adds new computing module (CM) and LCM maintenance software to address this problem. The software runs periodic audits for each LCM shelf for talk battery presence. If the audit fails to detect talk battery, a critical alarm message alerts the technician.

To support this feature, each LCM shelf must be provisioned with a minimum of one world line card (WLC). A subscriber can use this WLC for talk battery audit for call processing. A minor alarm message reports if the LCM shelf does not have WLCs available to perform the audit.

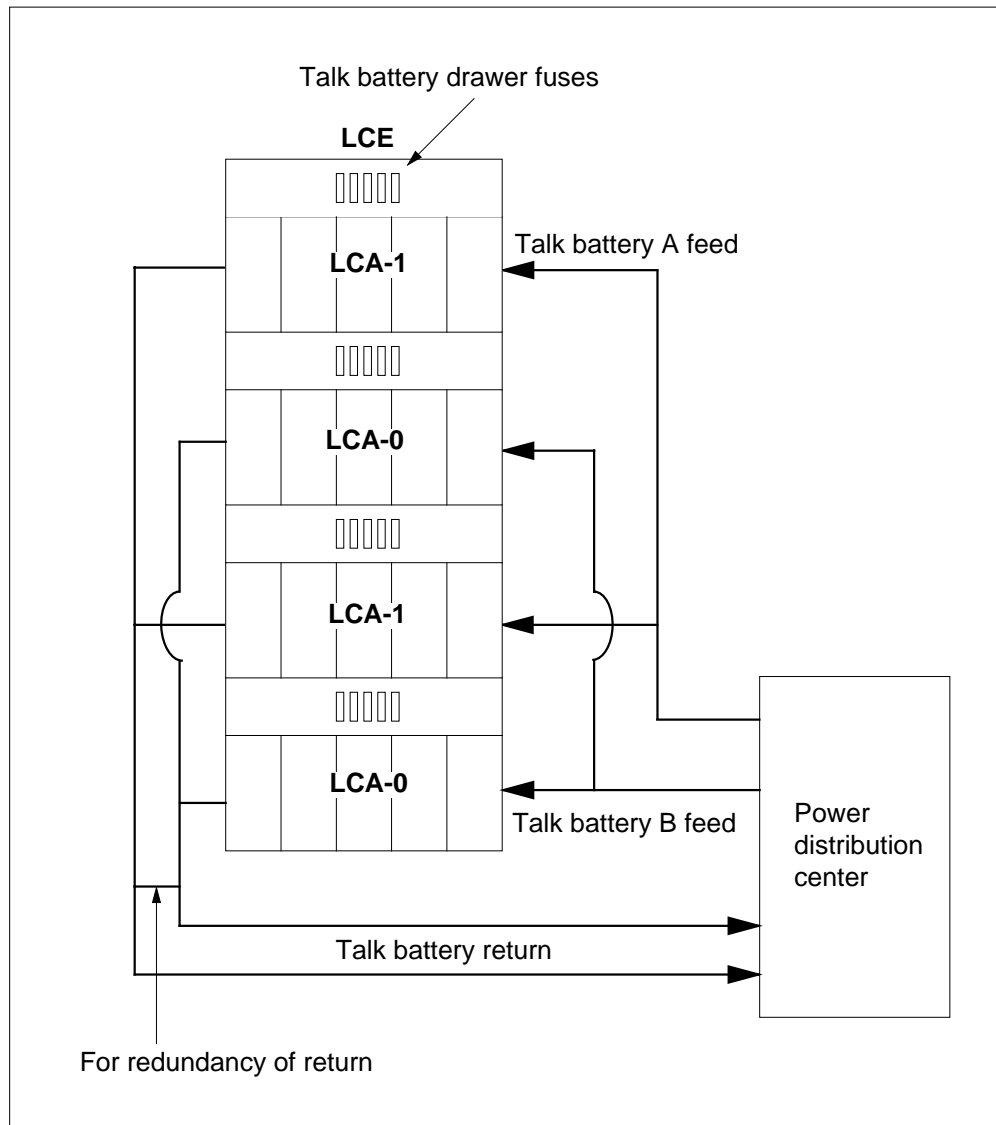
*Note:* This feature supports all WLC types. Examples of WLC types are the 6X17BA and 6X18BA WLCs. Restrictions do not apply to the location of the WLC in the LCM shelf.

#### Loss of talk battery

The distribution of talk battery in a line concentrating equipment (LCE) frame with four LCM shelves appears in the following figure.

## Talk Battery Alarm (continued)

### Talk battery distribution on LCE framexxx



The A feed provides talk battery for the second and fourth shelves of the LCE frame. The B feed provides talk battery for the first and third shelves. The feeds are not redundant. A single fault that loses a feed can affect two shelves. Two shelves can hold a maximum of 640 subscriber lines. Redundancy can occur with the talk battery returns. A single fault does not always cause an outage.

Before this feature, when a loss of talk battery occurs, the technician received no indication that a problem is present. An indication occurred only if the talk battery fuse blows. If the fuse blows, the system generates an external alarm.

## Talk Battery Alarm (continued)

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The LCM continues to indicate InSv (in service) on the MAP display. A fuse holder with faults or a broken wire can cause this talk battery loss. When this condition occurs, the system does not generate an external alarm. The LCM performs a line card audit. This audit cannot check for loss of talk battery. The loss of talk battery affects one or two LCM shelves. The location of the fault determines which shelves the loss of talk battery affects. Talk battery loss can occur at the LCM drawer level because each LCM drawer is fused for talk battery.

Without talk battery, the LCM line cards cannot signal or maintain an off-hook condition. Because of this condition, the LCM detects an off-hook line as on-hook. The system forces LCM calls to the on-hook state when loss of talk battery feed occurs. Because of this condition, LCM lines cannot originate and terminate calls when talk battery is not available.

### Feature activation

Changes to the value of office parameter TALK\_BATTERY\_ALARM in table OFCENG controls activation of the Talk Battery Alarm feature. The Talk Battery Alarm feature is disabled by default. A WLC must be provisioned in each LCM shelf in the office before you enable this feature. If this condition does not occur, a minor alarm occurs for each LCM shelf that does not contain a WLC.

When the Talk Battery Alarm feature is enabled, talk battery tests occur. The tests occur through diagnostics and background audits.

When you disable the Talk Battery Alarm feature, the system clears talk battery alarms and in-service trouble (ISTb) reasons related to this feature.

### Background audit

Each LCM can audit the shelves for loss of talk battery. When the Talk Battery Alarm feature disables, audits do not check for the loss of talk battery on the LCMs in the office.

When the Talk Battery Alarm feature is made able, the system performs a search to find an available WLC on each LCM shelf. To be available, a WLC must be in one of the following states:

- hardware assigned/software unassigned (HASU)
- assigned to a subscriber (working) and InSv

If more than one WLC is provisioned on an LCM shelf, this feature automatically searches for the first available WLC. This WLC is for use for the audit. The search begins in the first card in the first drawer of the shelf. The search continues in a sequential order through the shelf until an available

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## Talk Battery Alarm (continued)

---

WLC is found. The audit uses the selected WLC. The audit does not use this WLC if the WLC becomes not available. An example is out-of-service (OOS). When this condition occurs, the feature automatically selects the next available WLC on the shelf. If the maintenance line card (in LSG 0 card 0) is provisioned with a WLC, this card is available for the audit.

If this feature does not find an available WLC the system generates a minor alarm message. This message indicates that talk battery tests cannot occur for that shelf, and the LCM unit goes in an ISTb state. A WLC can be not available if the technician deletes the last available WLC on an LCM shelf. If the feature finds an available WLC, a special audit runs that performs periodic checks for loss of talk battery feed. This audit runs a minimum of one time for each minute. All tests on LCM shelves occur at the same time. This condition causes a check to occur to each LCM a minimum of one time for each minute. No audits run on OOS LCMs.

**Note 1:** A WLC can fail line card diagnostics and remain INSV. When this condition occurs, the Talk Battery Alarm feature uses the WLC. An example of these diagnostics is automatic line testing (ALT)

**Note 2:** The A and B talk battery feeds can be swapped. The Talk Battery Alarm feature does not attempt to correlate talk battery on an LCM shelf with a specified feed.

To test for loss of talk battery feed, the system instructs the WLC to verify the presence of talk battery feed to the WLC. The test passes if talk battery feed is present. The test fails if talk battery feed is not present. The report of talk battery failure occurs when the voltage level of the talk battery feed drops below 19 V ( $\pm 5$  V) DC.

If an INSV WLC is busy, the talk battery test does not occur. When this condition occurs, the WLC is assumed to pass. For this WLC to be busy, the WLC can be off-hook, call processing busy (CPB), or both. Examples of occupied states include talking, ringing, and lockout. For ringing, the WLC is on-hook and in a CPB state.

When the audit finds a failure of the talk battery test, the system generates a critical alarm log message. The LCM unit goes to ISTb state. The audit reports the failure again when diagnostics clears the alarm and ISTb state.

An available WLC in use for audit tests can become not available. When this condition occurs, the audit searches the shelf to find the next available WLC. The WLC can become not available if the WLC becomes OOS. If the audit finds another available WLC, audit tests continue with the new WLC. If the audit does not find an available WLC, the system generates a minor alarm

## Talk Battery Alarm (continued)

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message. The message indicates talk battery tests cannot occur, and the LCM unit goes in an ISTb state.

### Diagnostics

The InSv and OOS diagnostics for an LCM unit include the talk battery test. The diagnostics affected include the following commands:

- **TST PM/UNIT/REX**
- **RTS PM/UNIT**

Diagnostics affect the manual and automatic versions of these commands. The diagnostics run talk battery tests when the Talk Battery Alarm feature is enabled.

Diagnostics report talk battery failures. This condition occurs when tests run for the same LCM more than one time. If the talk battery test passes, the diagnostic clears the alarm and ISTb reason.

### Logs

The Talk Battery Alarm feature generates log report PM179 when the following conditions occur:

- The feature detects talk battery failure on an LCM shelf. When this condition occurs, a critical alarm message alerts the technician.
- A WLC is not available to test for talk battery on an LCM shelf. When this condition occurs, a minor alarm message alerts the technician.

*Note:* This feature generates log report PM179 if the Talk Battery Alarm feature is enabled and the LCM unit is in an INSV or ISTb state. This feature generates log report PM179 if the Talk Battery Alarm feature supports the LCM type. To enable this feature, set office parameter TALK\_BATTERY\_ALARM in table OFCENG to Y. Refer to Limits in this feature description for information on supported LCM types.

### Office parameter TALK\_BATTERY\_ALARM

The Talk Battery Alarm feature adds office parameter TALK\_BATTERY\_ALARM to table OFCENG. This parameter controls the activation of the Talk Battery Alarm feature. Correct values for this parameter are Y (Talk Battery Alarm feature enabled) and N (Talk Battery Alarm feature disabled). The default value is N. Refer to How to enter data into office parameters in this feature description, for more information.

### Translations table flow

Talk Battery Alarm does not affect translations table flow.



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**Talk Battery Alarm** (continued)

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**Limits**

The following limits apply to Talk Battery Alarm:

- The system supports Talk Battery Alarm feature on the following LCM types:
  - extended LCM (XLCM) (256-Kbyte capacity)
  - enhanced LCM with ISDN (LCME)
  - cabinetized XLCM (ELCM), also called Meridian cabinetized LCM)
  - remote line concentrating module (RLCM)
  - outside plant module (OPM), cabinetized RLCM with 256-Kbyte capacity
- The system does not support Talk Battery Alarm feature on the following LCM types:
  - international line concentrating module (ILCM)
  - international remote line concentrating module (IRLCM)
  - SRU (UK variant of LCM)
  - Austrian line concentrating module (ALCM)
  - LCM (64-Kbyte capacity)
  - ISDN line concentrating module (LCMI)
  - cabinetized LCM (64-Kbyte capacity) (ELCM)
- The same WLC that is in use for talk battery tests can be in use as a subscriber line. The talk battery test can be in progress on a WLC when the WLC goes off-hook to request a call origination. When this condition occurs, an additional delay of a maximum of 90 ms can occur before the subscriber receives dial tone. The talk battery test can be in progress on a WLC when the WLC receives a call termination request to ring the line. When this condition occurs, an additional delay of a maximum of 90 ms can occur before ringing begins. For originations and terminations, this small delay is the only impact on call processing.
- The Talk Battery Alarm feature can only detect the loss of talk battery *feed* to an LCM shelf. The WLC limits do not allow this feature to detect the loss of talk battery *return*. Talk battery returns are duplicated and return failures are less possible. Because of this condition, these limits are not a serious concern. Refer to the Talk battery distribution on LCE frame figure for more information on the duplication of talk battery returns.
- Limits to talk battery tests can occur when the LCM, or one of the C-side nodes, is in the overload condition.

## Talk Battery Alarm (continued)

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- The Talk Battery Alarm feature can only isolate shelf-level failures of talk battery feed. Because of this condition, the talk battery feed failures that the feature reports are failures that affect talk battery for all lines on the LCM shelf. This feature does not always detect drawer-level failures. The drawer which contains the WLC and the drawer that the failure occurs in determines if the feature detects drawer-level failures.
- Specified faults local to the WLC, or the WLC drawer, do not allow the WLC to correctly detect talk battery failures. These faults include faults that cause the WLC to fail line card diagnostics. When these conditions occur, the WLC can report talk battery failures wrong and cause the critical alarm. This condition occurs even when talk battery is present for other lines on the shelf. This condition does not occur often. The critical alarm message gives the location of the WLC to help troubleshoot these conditions.
- The Talk Battery Alarm feature does not affect emergency stand-alone (ESA) operation on remote cluster controllers (RCC), remote line concentrating modules (RLCM), or outside plant modules (OPM). The system ignores talk battery alarm conditions or reports during ESA operation. Because of this condition, reports of talk battery failures do not occur when an LCM is in ESA mode. When the exit of ESA mode occurs, the CM diagnoses the LCM to determine if talk battery failures are present.
- The Talk Battery Alarm feature activates when office parameter TALK\_BATTERY\_ALARM in table OFCENG is set to Y. When this condition occurs, a delay of a maximum of 10 min can occur before each LCM in the office begins an audit for talk battery failures. The time the LCM audit takes to cycle through each LCM in the office determines this delay time. An office with heavy traffic and a large number of LCMs can take longer than 10 min.

### Interactions

Talk Battery Alarm does not have functionality interactions.

### Activation/deactivation by the end user

Talk Battery Alarm does not require activation or deactivation by the end user.

### Billing

Talk Battery Alarm does not affect billing.

### Station Message Detail Recording

Talk Battery Alarm does not affect Station Message Detail Recording.

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## Talk Battery Alarm (end)

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### Datafilling office parameters

The office parameter that Talk Battery Alarm uses appears in the following table. Refer to *Office Parameters Reference Manual* for additional information on office parameters.

#### Office parameters by Talk Battery Alarm

Table name	Parameter name	Explanation and action
OFCENG	TALK_BATTERY_ALARM	<p>This parameter controls the activation of the Talk Battery Alarm feature. This feature provides periodic audits of each LCM shelf in an office for the presence of talk battery. Enter Y to activate the Talk Battery Alarm feature. Enter N to deactivate the feature.</p> <p><b>Note:</b> After this parameter is enabled for an office, a delay of a maximum of 10 min can occur before every LCM in the office begins audits for talk battery failures. The time the LCM audit takes to cycle through every LCM in the office determines this delay time. An office with heavy traffic and a large number of LCMs can take longer than 10 min.</p>

### Datafill sequence

The table that requires datafill to implement Talk Battery Alarm appears in the following table.

#### Datafill table required for Talk Battery Alarm

Table	Purpose of table
OFCENG	Office Engineering. This table contains data on engineering parameters for the office. Refer to How to enter office parameters in this feature description for more information.

### Tools for verifying translations

Talk Battery Alarm does not use tools for verifying translations.

### SERVORD

Talk Battery Alarm does not use SERVORD.

## Ten-per Line-digit GTT for CLASS Features

---

### Ordering codes

Functional group order code: BAS00003

Functionality order code: does not apply

### Release applicability

NA008 and later versions

### Requirements

To operate, Ten-digit GTT for CLASS Features has the following requirements:

- the MDC Minimum, MDC00001
- the MDC Standard, MDC00003
- the RES Service Enablers, RES00006
- the RES Non-display Services, RES00005

### Network configuration

Network (interoffice) configuration of Ten-digit GTT for CLASS Features requires Common Channel Signaling No. 7 (CCS7) connectivity. The CCS7 connectivity requires the following feature packages:

- Base ISUP, ISP70001
- TEL CCS7 Base, TEL00008

### Description

Before Ten-digit GTT for CLASS Features, you used one to six digits for global title translations (GTT). This feature allows you to use six to ten digits for GTT for the following features:

- Automatic Call Back (ACB)
- Automatic Recall (AR)
- Selective Call Rejection (SCRJ)
- Selective Call Forwarding (SCF)
- Selective Call Acceptance (SCA)
- Distinctive Ringing/Call Waiting (DRCW)

Office parameter PSTN\_GT\_SIZE (Public Switch Telephone Network Global Title Size) provides this ability. This parameter allows different offices that

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## Ten-per Line-digit GTT for CLASS Features (continued)

---

share the same numbering plan area (NPA) and NXX to identify the calling party address correctly.

You cannot enter a value for parameter PSTN\_GT\_SIZE that is lower than values in fields FROMDIGS and TODIGS in table C7GTT.

### Operation

Ten-digit GTT for CLASS Features does not have operation information.

### Translations table flow

Ten-digit GTT for CLASS Features does not affect translations data flow.

### Limits

Ten-digit GTT for CLASS Features does not have limits.

### Interactions

Ten-digit GTT for CLASS Features does not have functionality interactions.

### Activation/deactivation by the end user

Ten-digit GTT for CLASS Features does not require activation or deactivation by the end user.

### Billing

Ten-digit GTT for CLASS Features does not affect billing.

### Station Message Detail Recording

Ten-digit GTT for CLASS Features does not affect Station Message Detail Recording.

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## Ten-per Line-digit GTT for CLASS Features (end)

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### Datafilling office parameters

The office parameters that Ten-digit GTT for CLASS Features use appear in the following table.

#### Office parameters by Ten-digit GTT for CLASS Features

Table name	Parameter name	Explanation and action
OFCENG	PSTN_GT_SIZE	Office parameter PSTN_GT_SIZE lets the operating company specify the maximum number of digits for GTT internodal transaction capabilities application part (TCAP) messaging. The value of the parameter can range from six to 10 digits; the default value is six digits.
<b>Note:</b> You cannot enter a value for this parameter that is lower than values in fields FROMDIGS and TODIGS in table C7GTT.		

### Datafill sequence

Ten-digit GTT for CLASS Features does not affect datafill sequence.

### Tools for verifying translations

Ten-digit GTT for CLASS Features does not use tools for verifying translations.

### SERVORD

Ten-digit GTT for CLASS Features does not use SERVORD.

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## Traffic Separation Measurements System (TSMS)

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### Ordering codes

Functional group order code: BAS00003

Functionality order code: does not apply

### Release applicability

BCS20 and later versions

### Requirements

Traffic Separation Measurements System (TSMS) does not have requirements.

### Description

The TSMS combines features BR0465, TSMS Usage on Integrated Business Network (IBN) and BR0466, TSMS Report Summarized on IBN.

The TSMS extends the abilities of the TSMS to include IBN peg counts. The TSMS allows traffic separation measurements on calls that originate or terminate on a specified network class of service (NCOS) in a specified customer group.

The TSMS Usage on IBN extends the current TSMS to include IBN usage measurements.

The TSMS Report Summarized on IBN extends the TSMS to include summary reports for IBN and IBN custom calling features. The TSMS Report Summarized on IBN incorporates traffic separation measurement facilities with IBN. The TSMS measurements are on calls that originate or terminate on a specified NCOS in a specified customer group.

### Operation

The TSMS allows traffic separation measurements on calls that originate or terminate on a specified NCOS in a specified customer group.

The components of a call for measurement and separation include the following items:

- call setup time
- point-to-point attempt peg count
- point-to-point connect time
- originating traffic data according to call type

## **Traffic Separation Measurements System (TSMS)** (continued)

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Point-to-point attempt peg counts are a count of connections made through the switch. Setup use time is a count of the time to set up a call. Connect use time is a count of the period of the connection.

Attendant console extended calls are also pegged. For these calls, a count generates from the originator to the console. When the call is extended, a count generates from the console to the terminator.

The traffic separation measurement includes different MDC lines. To identify the lines to include in the traffic separation measurement, enter a traffic separation number, TRAFSNO, in table NCOS. The traffic separation numbers are one of the following:

- a source traffic separation number when the call originates
- a destination traffic separation number when the call terminates
- a source traffic separation number and a destination traffic separation number

Operation of Traffic Separation Measurements System (TSMS) is transparent to the end user. Only datafill can activate the TSMS.

### **Translations table flow**

Traffic Separation Measurements System (TSMS) does not affect translations table flow.

### **Limits**

Traffic Separation Measurements System (TSMS) does not have limits.

### **Interactions**

Traffic Separation Measurements System (TSMS) does not have functionality interactions.

### **Activation/deactivation by the end user**

Traffic Separation Measurements System (TSMS) does not require activation or deactivation by the end user.

### **Billing**

Traffic Separation Measurements System (TSMS) does not affect billing.

### **Station Message Detail Recording**

Traffic Separation Measurements System (TSMS) does not affect Station Message Detail Recording.



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## Traffic Separation Measurements System (TSMS) (continued)

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### Datafilling office parameters

The office parameters that the TSMS uses appear in the following table. See the *Office Parameters Reference Manual* for additional information about office parameters.

#### Office parameters by Traffic Separation Measurements System (TSMS)

Table name	Parameter name	Explanation and action
OFCOPT	TFAN_ENHANCED_FEATURE	Specifies if additional source and destination numbers, operational measurement registers, and tuples in table TFANINT are required for the traffic separation feature. Enter Y or N. The default value is N.
OFCENG	TFAN_IN_MAX_NUMBER	Specifies the maximum number of source traffic separation numbers (STSN) for assignment to any incoming and two-way trunk groups in table TRKGRP (Trunk Group), lines in table LINEATTR (Line Attribute), and network class of service numbers in table NCOS. Enter SIZE_15, SIZE_31, SIZE_63, or SIZE_127. The default value is SIZE_15.
OFCENG	TFAN_OUT_MAX_NUMBER	Specifies the maximum number of destination traffic separation numbers (DTSN) for assignment to any outgoing and two-way trunk groups in table TRKGRP, lines in table LINEATTR, network class of service numbers in table NCOS, announcements in table ANNS (Announcements), tones in table TONES (Tones) and special tones in table STN (Special Tone). Enter SIZE_15, SIZE_31, SIZE_63, or SIZE_127. The default value is SIZE_15.

---

## Traffic Separation Measurements System (TSMS) (continued)

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### Datafill sequence

The tables that require datafill to implement Traffic Separation Measurements System (TSMS) appear in the following table. The tables appear in the correct entry order.

#### Datafill requirements for Traffic Separation Measurements System (TSMS)

Table	Purpose of table
OFCOPT	Office Option. This table contains data on option parameters for the office. Refer to How to enter office parameters for how TSMS affects office parameters.
OFCENG	Office Engineering. This table contains data on engineering parameters for the office. Refer to "Datafilling office parameters" for how TSMS affects office parameters.
NCOS	Network Class of Service. This table contains the network class of service (NCOS) numbers assigned to the following: <ul style="list-style-type: none"><li>• attendant consoles</li><li>• MDC or Subscriber Services (RES) stations</li><li>• incoming sides of two-way MDC trunk groups</li><li>• authorization codes</li><li>• customer groups</li></ul>
TFANINT	Traffic Separation Intersection. This table separates calls by type of call at the intersection of specified source and destination traffic separation numbers.

### Datafilling table NCOS

Table NCOS contains the network class of service (NCOS) numbers assigned to the following:

- attendant consoles
- MDC or Subscriber Services (RES) stations
- incoming sides of two-way MDC trunk groups
- authorization codes
- customer groups

You must enter data in table NCOS to assign a traffic separation number to each NCOS group.

**Traffic Separation Measurements System (TSMS) (continued)**

Datafill for TSMS for table NCOS appears in the following table. The fields that apply to the TSMS appear in this table. See the data schema section of this document for a description of the other fields.

**Datafilling table NCOS**

Field	Subfield or refinement	Entry	Explanation and action
CUSTGRP		alphanumeric (1 to 16 characters)	Customer group name. This field specifies the name of the customer group. Enter a 1- to 16-alphanumeric character name.
NCOS		0 to 511	Network class of service number. This field specifies the NCOS number. Enter a value from 0 to 511.
TRAFSNO		0 or 10 to 127	Traffic separation number. This field specifies the traffic separation number assigned to the NCOS number in table TFANINT. Enter 0, or a value from 10 to 127.

**Datafill example for table NCOS**

Sample datafill for table NCOS appears in the following example.

**MAP example for table NCOS**

CUSTGRP	NCOS	NCOSNAME	LSC	TRAFSNO	OPTIONS
MDCGRP1	40	MDCPBL	0	0	XLAS PBLXLA NXLA NDGT

**Datafilling table TFANINT**

Table TFANINT separates calls by type of call at the intersection of specified source and destination traffic separation numbers. You must enter data in table TFANINT to allow traffic separation measurements by call type.

**Traffic Separation Measurements System (TSMS)** (continued)

Datafill for the TSMS for table TFANINT appears in the following table. The fields that apply to TSMS appear in this table. See the data schema section of this document for a description of the other fields.

Datafilling table TFANINT (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
INDX		see subfields	Index. This field contains subfields TFANIN and TFANOUT.
	TFANIN	0 to 127	Incoming traffic separation number. This subfield specifies the incoming traffic separation number assigned to the intersection. Enter a value from 0 to 127.  <b>Note:</b> If you specify 127 incoming traffic separation numbers, the recommended maximum value of outgoing traffic separation numbers is 125. The recommended maximum value of outgoing traffic separation numbers is 125 because of storage restrictions.
	TFANOUT	0 to 127	Outgoing traffic separation number. This subfield specifies the outgoing traffic separation number assigned to the intersection.  <b>Note:</b> If you specify 127 outgoing traffic separation numbers, the recommended maximum value of incoming traffic separation numbers is 125. The recommended maximum value of incoming traffic separation numbers is 125 because of storage restrictions.
DDREGNO		0 to 2047	Direct dial register number. This field specifies the register number assigned to the intersection for peg count of direct dial calls. Enter a value from 0 to 2047. When you do not require a peg count of direct dial calls, enter 0.

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## Traffic Separation Measurements System (TSMS) (end)

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**Datafilling table TFANINT (Sheet 2 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
OAREGNO		0 to 2047	Operator assisted register number. This field specifies the register number assigned to the intersection for peg count of operator-assisted calls. Enter a value from 0 to 2047. When you do not require a peg count of operator assisted calls, enter 0.
NPREGNO		0 to 2047	No prefix register number. This field specifies the register number assigned to the intersection for peg count of no prefix calls. Enter a value from 0 to 2047. When you do not require a peg count of no prefix calls, enter 0.

**Datafill example for table TFANINT**

Sample datafill for table TFANINT appears in the following example.

**MAP example for table TFANINT**

INDX	DDREGNO	OAREGNO	NPREGNO
10 10	800	800	800

**Tools for verifying translations**

Traffic Separation Measurements System (TSMS) does not use tools for verifying translations.

**SERVORD**

Traffic Separation Measurements System (TSMS) does not use SERVORD.



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## 2 Datafilling BAS ANI Enhanced

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The following chapter describes the BAS ANI Enhanced, BAS00018, functionality.

## DMS-200 ANI to Charge Number Conversion

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### Ordering codes

Functional group ordering code: BAS00018

Functionality ordering code: N/A

### Release applicability

NA008 and later versions

DMS-200 ANI to Charge Number Conversion was introduced in NA002.

### Requirements

Feature DMS-200 ANI to Charge Number Conversion has the following requirements to operate:

- BAS00003 BAS Generic
- RES00006 RES Service Enablers
- EAQ00001 EQA Local
- CDD00001 CDD Loc Services
- OSB00001 Operator Services Basic
- ISP70001 Base ISUP
- BAS00018 BAS ANI Enhanced

### Description

The DMS-200 ANI to Charge Number Conversion (ANI to CN) enhances CAMA to ISUP interworking. This enhancement makes sure billing information transmits over the outgoing signaling link associated with ISUP agents. The ANI spill of an incoming CAMA signal to a toll office contains this billing information. This functionality is controlled on a trunk group basis through table ANICNCTL.

*Note:* For the remainder of this document, the name DMS Toll Office refers to DMS-100/200, DMS-200, and DMS-100/200 TOPS offices. The name CAMA refers to DT, DP and MF SC, and TOPS CAMA trunks or trunk groups.

### Operation

The Originating Line Information (OLI) and Charge Number (CN) parameters must transmit together. An OLI with a value that corresponds to ANI Information digits received in the incoming CAMA signal is inserted in the



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**DMS-200 ANI to Charge Number Conversion** (continued)

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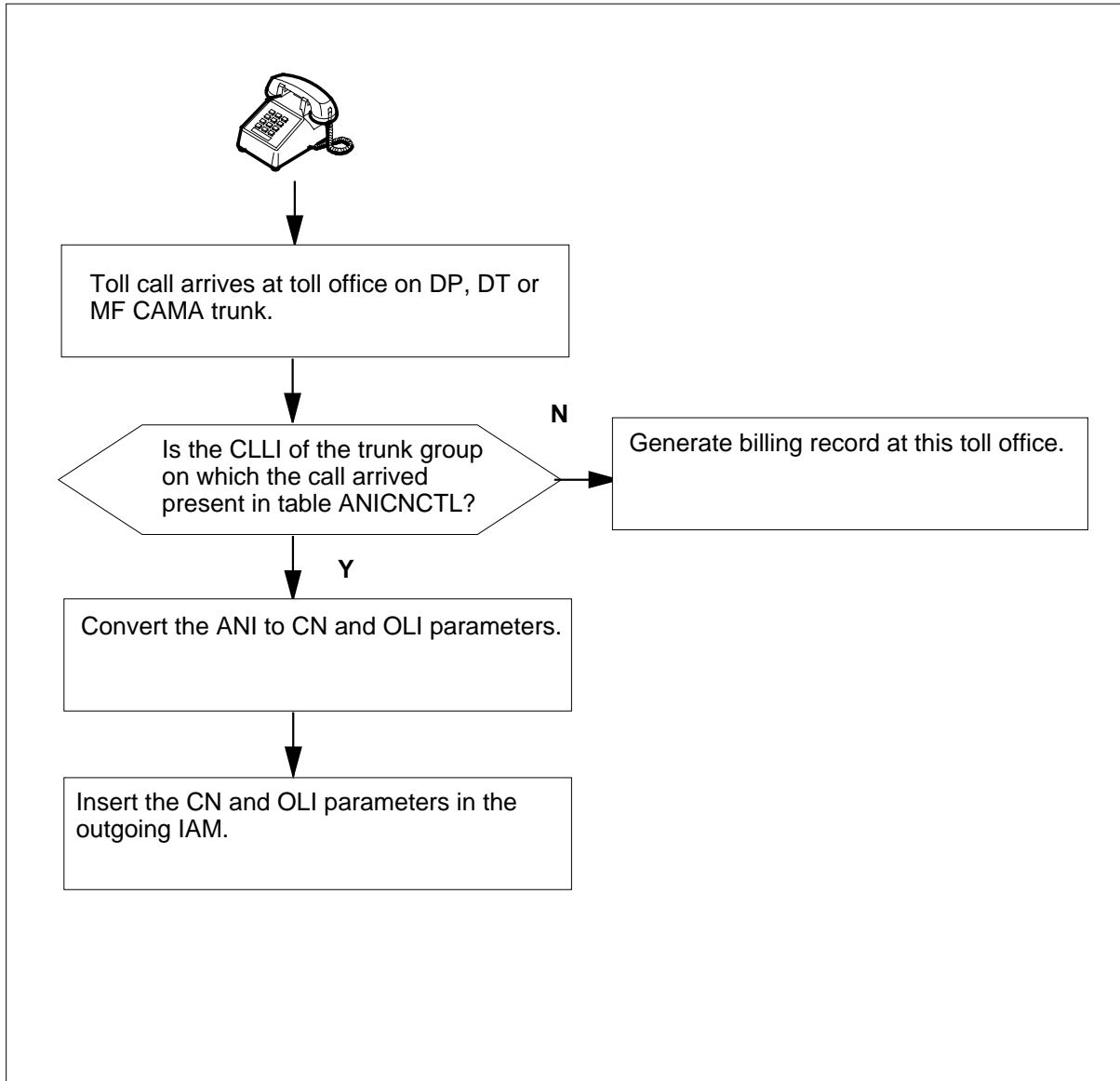
IAM. This IAM leaves the DMS Toll office. This feature does not create or modify the calling party number IAM parameter.

This feature converts the Automatic Number Identification (ANI) digits to a CN parameter. The ANI digits transmit over Digitone (DT), Dial Pulse (DP) or Multi-frequency (MF) Centralized Automatic Message Accounting (CAMA) trunks at a toll office. The new Charge Number (CN) parameter is for an outgoing Common Channel Signaling No 7 (CCS7) ISDN User Part (ISUP) Initial Address Message (IAM).

The system maps the ANI information digits received with the ANI digits to the OLI parameter of the outgoing IAM. When a call transmits over a CAMA trunk and terminates on an ISUP trunk, the system codes ANI digits to the CN. The system maps the ANI Information digits to the OLI. The system adds the CN parameter to the IAM. If the system completes this action, the system adds the OLI parameter to the IAM. This process appears in figure 1-1.

## DMS-200 ANI to Charge Number Conversion (continued)

### 1-1 Operation for the ANI to CN feature



#### ANI to CN conversion

The ANI that transmits over CAMA trunks contains seven digits. Convert the seven digits to a 10-digit number before you place the digits in the address digits field of the CN parameter. Determine the NPA to convert these seven digits into the 10-digit number. You can determine the NPA for SC calls from table BILLCODE and the NPA for TOPS calls from table TOPSBC.

The Nature of Address Indicator field of the CN parameter is coded as ANI of the calling party: national number (0000011). The Numbering Plan field is

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## DMS-200 ANI to Charge Number Conversion (continued)

---

coded as ISDN numbering plan (001). The settings of the CN parameter fields are the same for all call plans with the same conversion process. The field design of the Charge Number parameter appears in the following table.

Charge Number parameter fields							
8	7	6	5	4	3	2	1
Odd/ Even	Nature of Address Indicator						Octet 1
Spare	Numbering Plan			Reserved		Octet 2	
2nd Address Signal				1st Address Signal			Octet 3
...				...			Octet ...
Filler (if necessary)				nth Address Signal			Octet n

### Conversion Control

Table ANICNCTL identifies SC and TOPS trunk groups in the office. This table identifies the trunk groups in which the ANI spill must convert to the CN and OLI parameters. If a trunk group is an entry in this table, the conversion process occurs for all calls that transmit over these trunks. These calls must route out to Public ISUP trunks.

### ANI II (or I) to OLI Conversion

The ANI to OLI conversion occurs after successful ANI to CN conversion and the addition of CN to the IAM. In the conversion, the system maps the OLI parameter according to the ANI II or I information digits. The ANI spill delivers these information digits. The mapping of the ANI digits to OLI appears in the following table. The system maps the ANI II digits that do not appear in the table to the number equivalent OLI value of the digits. For example, if ANI II = 17, the system maps this digit to OLI = 0001 0001. The system maps the OLI to Identified Line (0000 0000) by default.

#### The 2 ANI II (or I) to OLI parameter mapping (Sheet 1 of 2)

ANI II (I) Digits	Meaning	OLI Code
00 (0 or 3)	Identified line	0000 0000
01 (1 or 4)	Operator Number Identification (ONI) (Multiparty)	0000 0001
02 (2 or 5)	ANI failure; unavailable	0000 0010

**DMS-200 ANI to Charge Number Conversion** (continued)**The 2 ANI II (or I) to OLI parameter mapping (Sheet 2 of 2)**

<b>ANI II (I) Digits</b>	<b>Meaning</b>	<b>OLI Code</b>
06 (6)	Hotel (without room identification)	0000 0110
07 (7)	Coinless, hospital, inmate, etc. (screening)	0000 0111
08	InterLATA Restricted	0000 1000
10	Test Call	0000 1010
20	AIOD - listed DN set	0001 0100
23	Coin or non-Coin (identified line)	0001 0111
24	800 call	0001 1000
27	Coin line	0001 1011
68	InterLATA Restricted - Hotel line	0100 0100
78	InterLATA Restricted - Coinless Line, etc.	0100 1110

**Handling of ONI calls and ANI failures**

Operator Number Identification (ONI) is a service like the DDD service. In the ONI service, the operator obtains through speech the billing number before the call can complete. When the calling party number for a specified call is not available, ANI failure (ANIF) occurs. A limit or failure of the switching or transmission equipment in call processing can cause the number to be not available. You can handle both conditions with the same method. When ANI failure or ONI occurs, ANI digits do not transmit over the SC or TOPS trunk. You can collect the ANI information through a TOPS or CAMA position. You can obtain a 10-digit ANI and place the ANI in the CN parameter.

If routing to a TOPS or CAMA position does not occur, the ANI information is not available when a call routes to the public ISUP trunk. This condition occurs when a CAMA suspension occurs. The ANI information does not route to a TOPS or CAMA position during a CAMA delay. When the ANI information is not available, the system does not add the CN and OLI parameters to the IAM. The call transmits through this DMS Toll Office.

**Limits**

The following limits apply to DMS-200 ANI to Charge Number Conversion:

- This feature supports only SC and TOPS trunk group types on the incoming side of a DMS Toll Office and ISUP IT. On the outgoing side, this feature only supports TO and T2 trunk group types. The system does

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## DMS-200 ANI to Charge Number Conversion (continued)

---

not add the CN and OLI parameters to the IAM for incoming calls on trunk group types other than SC and TOPS. The system does not add the CN and OLI parameters to the IAM for outgoing calls on trunk group types. These types do not include ISUP IT, TO or T2.

- The SC trunks cannot connect to a TOPS or CAMA position. Loop-around OP/TOPS trunks can connect to the TOPS or CAMA position for specified calls. These calls are the CAMA calls that arrive at the DMS Toll Office over SC trunks. These calls require operator interruption. For the ANI to CN conversion to occur, table ANICNCTL must contain an entry for the loop-around TOPS trunk group.
- The ANI information digits are not available to this feature for CAMA calls. These calls are routed to a TOPS or CAMA position at the DMS Toll Office. For these types of calls, the system maps the OLI parameter to Identified Line (0000 0000).
- This feature supports OA calls between a Class 5 End Office and a DMS Toll Office. The service for which this feature is intended does not support these call types.

### Interactions

The system does not add CN and OLI parameters to the IAM if another service already includes the CN parameter. Other services that include the CN parameter are Equal Access and 800 Plus Southbound.

The system does not generate CN and OLI parameters if call forwarding occurs at the DMS Toll Office. This condition can occur in DMS-100/200 and DMS-100/200/TOPS combined offices in which the Toll Office serves the called/forwarding party.

The system generates and adds the CN and OLI parameters to the IAM. The system generates and adds the calls for calls forwarded to the Toll Network over CAMA trunks.

### Billing

If ANI converts to CN or OLI and the outgoing IAM includes CN or OLI, billing occurs at the destination office. If this action does not occur, billing occurs in the toll office before the system routes the call.

### Station Message Detail Recording

The DMS-200 ANI to Charge Number Conversion feature does not affect Station Message Detail Recording.

## DMS-200 ANI to Charge Number Conversion (continued)

### Datafilling office parameters

The DMS-200 ANI to Charge Number Conversion feature does not affect office parameters.

### Datafill sequence

The tables that require data entry to start DMS-200 ANI to Charge Number Conversion appear in the following table. The tables appear in the correct entry order.

#### Datafill requirements for DMS-200 ANI to Charge Number Conversion

Table	Purpose of table
TRKGRP	Specifies the CLLI code and characteristics of trunk groups
ANICNCTL	Specifies the CLLI code for trunk groups on which ANI to CN conversion must occur

### Datafilling table TRKGRP

The datafill for ANI to CN for table TRKGRP appears in the following table. The fields that apply directly to this feature appear.

#### Datafilling table TRKGRP

Field	Subfield or refinement	Entry	Explanation and action
CLLI		1 through 16 alphanumeric characters	Common language local identifier. Enter the CLLI code that identifies the trunk group. Table ANICNCTL uses this CLLI code.

### Datafill example for table TRKGRP

Sample datafill for table TRKGRP appears in the following example.

#### MAP example for table TRKGRP

```

GRPKEY
-----
CMAAIN2WA
OC 0 ELO NCRT LINE MIDL WK N N 2W JAN NSCR 613 LCL CV N N
N $
    
```

---

## DMS-200 ANI to Charge Number Conversion (end)

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### Datafilling table ANICNCTL

The datafill for ANI to CN for table ANICNCTL appears in the following table.

#### Datafilling table ANICNCTL

Field	Subfield or refinement	Entry	Explanation and action
TRKGRP		1 through 16 alphanumeric characters	Trunk Group. Enter the CLLI code of a trunk group on which ANI to CN conversion must occur.  <b>Note:</b> The CLLI code must be in table TRKGRP.

#### Datafill example for table ANICNCTL

Sample datafill for table ANICNCTL appears in the following example.

#### MAP example for table ANICNCTL

TRKGRP  -----  LNTPSI ICAMPDCM
---

### Tools for verifying translations

The DMS-200 ANI to Charge Number Conversion feature does not change tools for verifying translations.

### SERVORD

The DMS-200 ANI to Charge Number Conversion feature does not use SERVORD.

#### SERVORD limits

The DMS-200 ANI to Charge Number Conversion feature does not have SERVORD limits.





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## 3 Understanding BAS CCS7

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This chapter describes the Common Channel Signaling 7 network and defines translations as it applies to the CCS7 network. It describes the translations database and the audience for which this book is intended. This chapter also explains translations terminology.

### Components of a telephone call

A telephone call has two components:

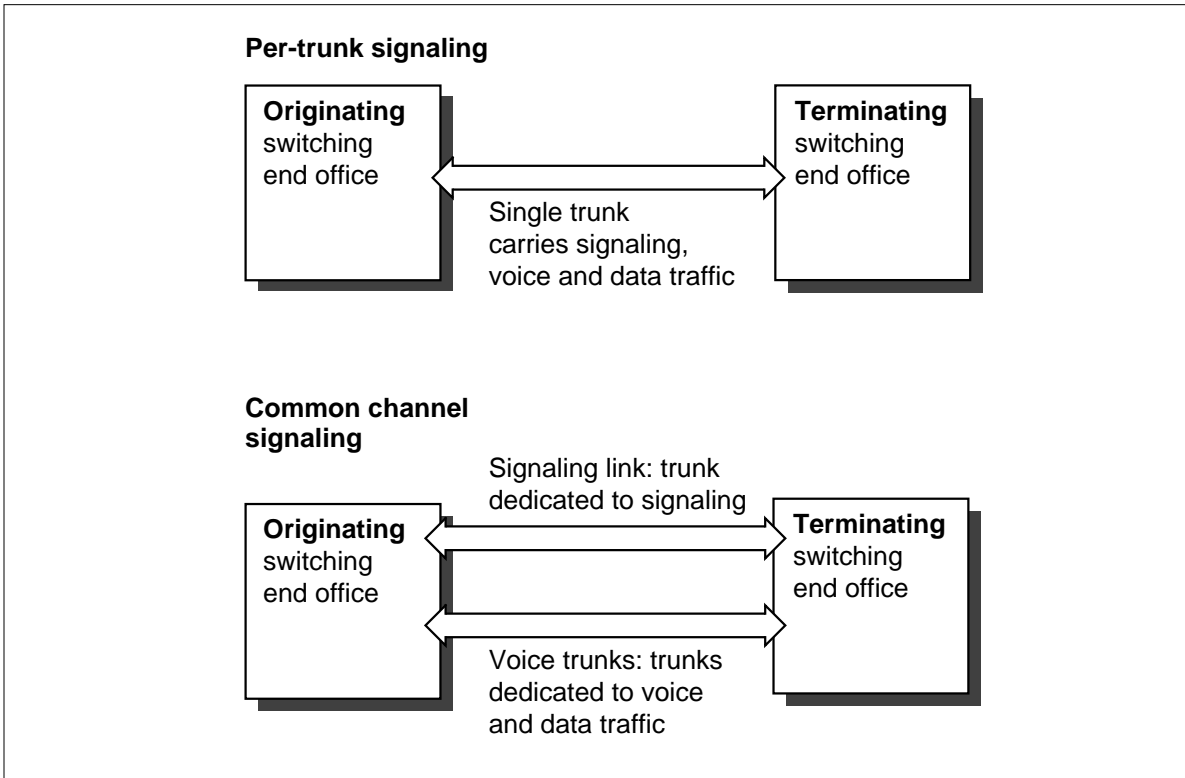
- signaling component
- voice and data component

The signaling component of a telephone call contains the supervisory and address signals that switching offices use to control the setting up, monitoring, and taking down of the call.

The voice and data component contains only the information being transferred between the originator and the recipient of the call.

The following figure illustrates a simple per-trunk signaling call between an originating switching office and a terminating switching office. Both the signaling traffic and the voice and data traffic are transmitted over a trunk that is dedicated to the call.

**Figure 3-1 Comparison of per-trunk signaling to common channel signaling**



**Common channel signaling**

Common channel signaling 7 (CCS7) separates the signaling component from the voice and data component of a call. It puts these two components on different facilities, as illustrated in the bottom half of the figure shown above. The facility used for signaling is called a signaling link (SL) or a signaling data link (SDL). The facility used for voice and data traffic is called a voice trunk.

The amount of signaling information required for a call is small compared to the voice and data component of the call. Therefore, the signaling information for many voice calls can transmit over one SL. Also, the SL can carry signaling that is not directly associated with a call, without any loss of call processing capabilities.

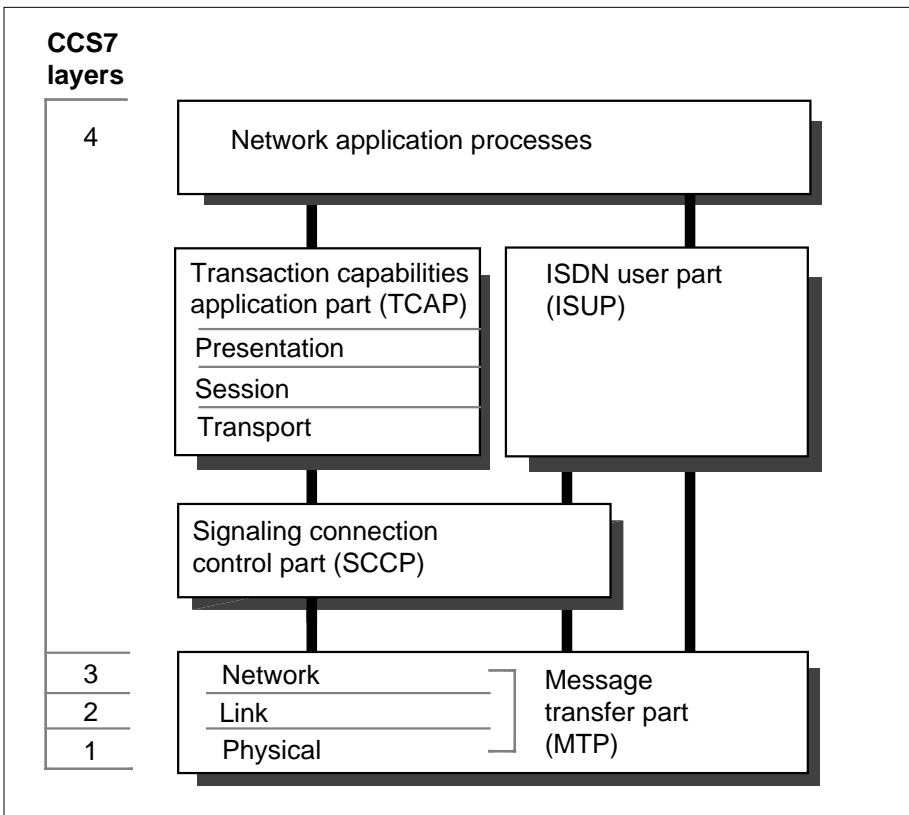
CCS7 allows the signaling component of a call to be separated from the voice and data component. It provides a method for easily transmitting signaling information that is not directly call related. Furthermore, CCS7 allows operating companies, such as local exchange carriers and interexchange carriers in the United States, to expand the range of available database services. In this way, operating companies can offer number services such as dial 800 Services or alternate billing services such as automated calling card service (ACCS) and custom charge calling.

## CCS7 protocol: a layered model

The functional software of the CCS7 system separates into layers. These layers correspond to the levels of activity required to support the interconnection and exchange of information between the many users of a communications system. Because these these layers are modular, CCS7 provides enough flexibility to serve many applications.

The previous figure and the following figure illustrates the four-layer protocol of CCS7 as defined by the CCITT Signaling System 7 (SS7).

Figure 3-2 CCS7 model



The software architecture consists of the following:

- message transfer part (MTP)
- signaling connection control part (SCCP)
- transaction capabilities application part (TCAP)
- ISDN user part (ISUP)
- network application process

### **Message transfer part**

The MTP serves as a transportation system, providing reliable transfer of signaling messages between nodes in the network.

The three MTP level are as follows:

- SDL level
- SL function level
- signaling network function level

The SDL level handles the transmission of bits over a bidirectional path. The path consists of two data channels that operate in opposite directions but at the same data rate. It also defines the physical, electrical, and procedural characteristics of the SDL. MTP level 1 is a hardware function under software control.

The SL function level handles both incoming and outgoing signaling messages. Main functions carried out at this level include the following:

- signal unit alignment and delimitation
- error detection and correction
- SL alignment
- SL error monitoring
- flow control

The signaling-network function level transfers messages between signaling points (SP) in a signaling network.

### **Signaling connection control part**

The SCCP resides above the MTP and provides it with additional functions in order to accommodate both connectionless and connection-oriented services. The SCCP does the following:

- provides application addressing and management through global title translation (GTT)
- keeps track of the status of applications
- lets the user know when an application is not available.

**Note:** Most of the specifications used by the MTP and SCCP are defined according to operating company requirements. The operating company determines these specifications through datafill.

### Transaction capabilities application part

TCAP provides a set of generic procedures for transaction-based applications. It also controls the transfer of non-circuit-related information between two or more nodes in a signaling network. It provides services that support database transaction type applications such as ACCS, Billed Number Screening (BNS), or Call Management Services (CMS).

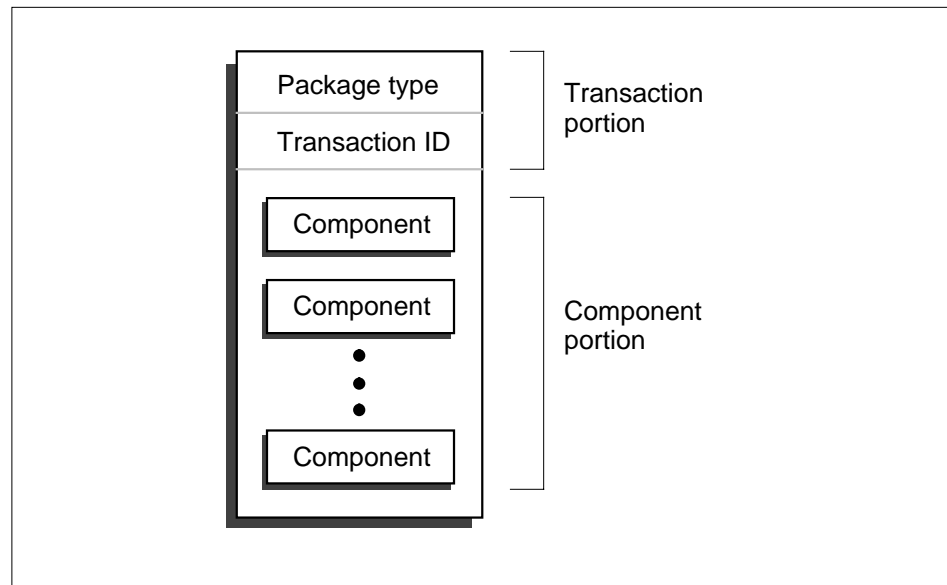
The 1st figure and the following figure illustrates a TCAP message. It has the following portions:

- transaction portion
- component portion

The transaction portion contains the package type and the transaction ID. Package types such as QUERY WITH PERMISSION or RESPONSE are used for directory number (DN) validation.

The component portion consists of a sequence of one or more TCAP components. A component may invoke operations on a remote node, return the results of operations, or report TCAP protocol or application errors.

**Figure 3-3 TCAP message parts**



### ISDN user part

ISUP is the signaling used for setting up, monitoring, and taking down CCS7 calls on ISUP trunks. ISUP provides enhanced trunk call processing capabilities resulting in the following:

- faster call setup
- shorter holding times for unsuccessful call attempts
- the ability to carry both voice and data signals at the same time

### Network application processes

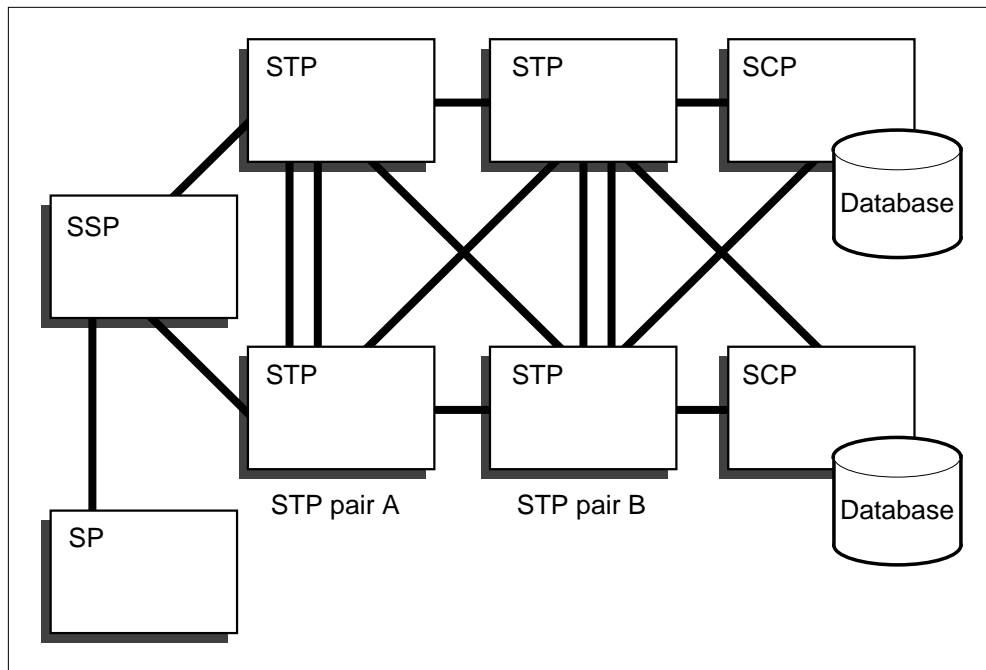
Network application processes are CCS7-based services that involve interprocess transactions, call control, or database applications such as area-wide centrex, Enhanced 800 Service, and private virtual networking.

### Elements of a CCS7 network

A CCS7 network consists of a number of special purpose nodes that are interconnected by SLs.

The 1st figure and the following figure illustrates the different types of nodes in a simple CCS7 signaling network configuration. The size and complexity of a signaling network depends on the volume of traffic and the degree of redundancy required.

Figure 3-4 CCS7 nodes in a signaling network



CCS7 networks are composed of the following types of nodes and SLs:

- SP
- service switching point (SSP)
- signaling transfer point (STP)
- service control point (SCP)
- integrated node (INode)
- A, B, C, D, E, and F SLs

### **Signaling point**

An SP is a switching office that supports CCS7 voice trunk capability (ISUP messaging). It provides an interface between subscriber lines and the CCS7 network. An SP either originates, terminates, or transfers signaling messages from one node to another using SLs. An SP is normally co-located with a class 5 switching office (an end office).

### **Service switching point**

In addition to the functions provided by an SP, an SSP has software for communicating with CCS7 databases (TCAP messaging).

These databases, located at SCPs, provide centralized services that include the following:

- 800 Service
- ACCS
- BNS

An SSP may communicate with many different SCPs, depending on the number and range of applications available. An SSP is normally co-located with a class 4 switching office (a toll office).

### **Signaling transfer point**

An STP is a packet-switching system that transports messages between CCS7 nodes. As a cost-effective alternative to interconnecting all nodes directly to one another, STPs serve as hubs in a CCS7 network.

STPs transfer messages between SLs, but, with the exception of network management information, do not originate or terminate messages. An STP functions like a tandem office.

STPs are deployed in pairs. If one STP fails, the mate takes over, ensuring that service continues without interruption.

### **Service control point**

An SCP provides the database storage and processing required to implement enhanced centralized services. The SCP accepts a query for information, retrieves the requested information from the correct database, and sends a response message to the originator of the request. SCP functionality can be enhanced, for example, by adding or updating databases, without affecting any other node in the CCS7 network.

### **Integrated node**

An INode is a combined SSP and STP that supports all the functions of both node types. The combination allows the use of a single site and a reduced number of frames and cabinets. Operating companies can integrate CCS7 elements into a single node to gain cost savings that result from the following factors:

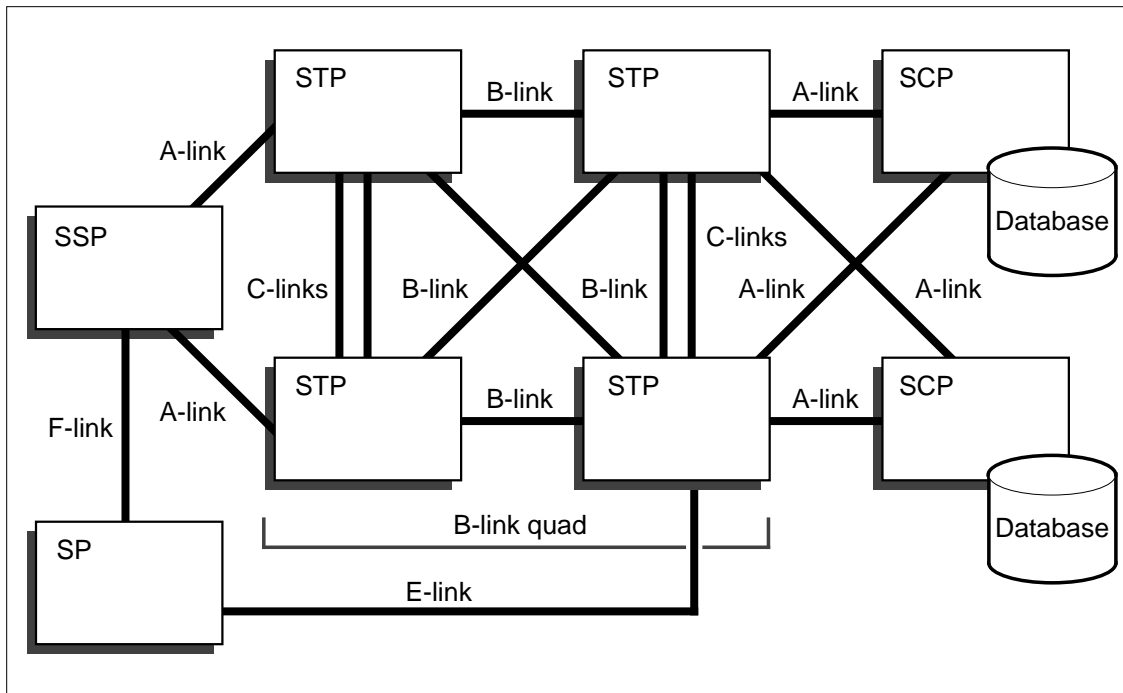
- shared equipment
- reduced transmission facilities
- integrated operations
- integrated administration
- integrated maintenance

### **Signaling links**

An SL consists of signaling terminal equipment and a transmission facility. SLs are used for the exchange of information between nodes in a CCS7 network. The number and types of links depend on node capacity, network configuration, and network traffic levels. Types of SLs are illustrated in the st figure and the following 2 figures.



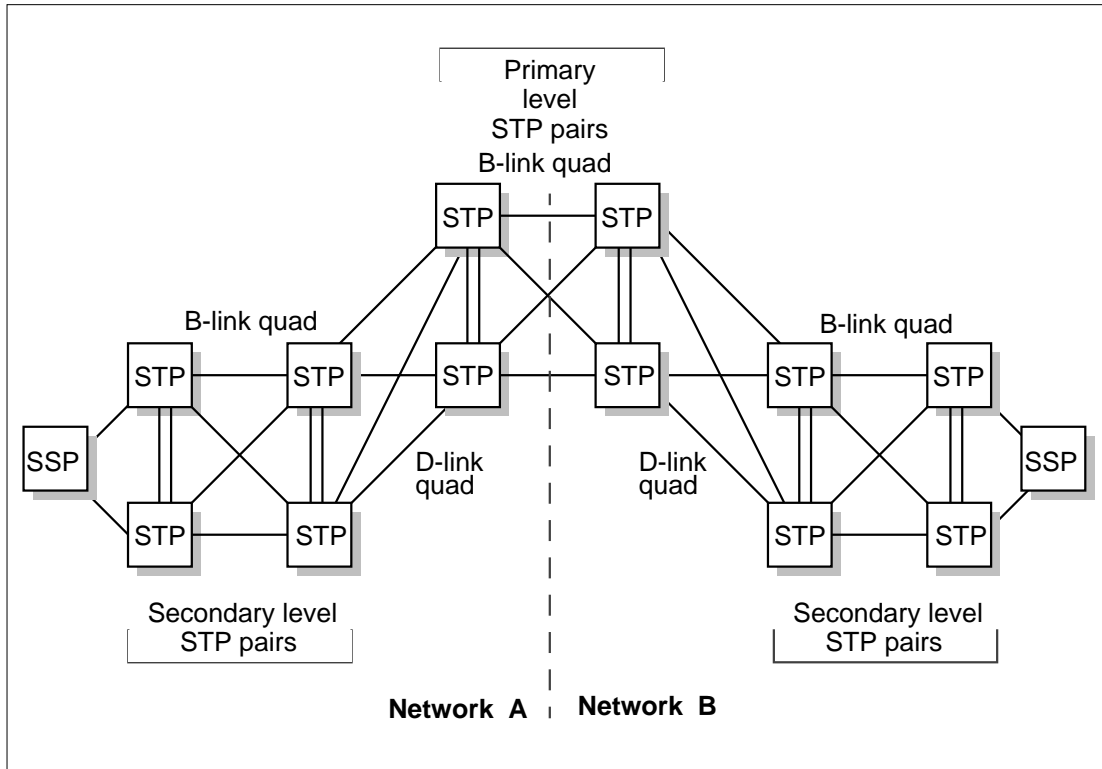
Figure 3-5 CCS7 signaling links



The following are different types of SLs:

- **A-links (access links)** connect SSPs and SCPs to STPs. A-links are always assigned in pairs, one link to each STP in a mated pair.
- **B-links (bridge links)** connect mated STP pairs in an SL quad. This quad structure provides complete STP redundancy.
- **C-links (cross links)** connect two STP nodes, in order to create an STP pair.
- **D-links (diagonal links)** connect secondary STP pairs to primary STP pairs to form a D-link quad, as illustrated in the following figure .
- **E-links (extended links)** connect SPs, SSPs, and SCPs to remote STP pairs.
- **F-links (fully-associated links)** connect SPs, SSPs, and SCPs to one another.

Figure 3-6 Two-layer STP network



For more information on the CCS7 network, refer to *DMS SuperNode Common Channel Signaling 7 Product Guide*, 297-5151-010.

### What is translations?

Translations is the process by which the system accesses and processes information in data tables to allow the network or feature to operate. In order to implement the CCS7 network, some tables must be datafilled in the correct sequence to ensure the smooth operation of the network.

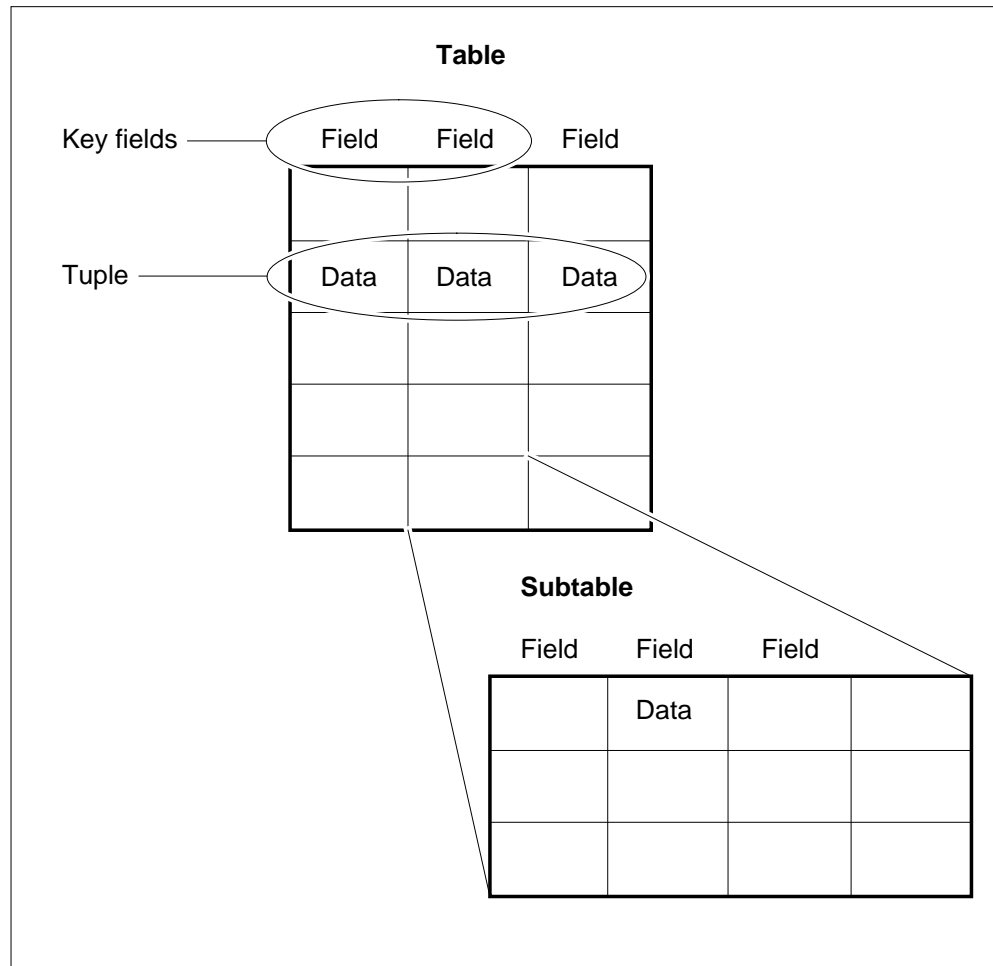
### Translations database

In order to perform translations, the switch must access data stored in the computing module (CM) memory called the translations database.

The translations database contains many data tables. Each table has a particular purpose and contains the data related to this purpose. For example, table C7RTESET logically associates linksets used in routes through a CCS7 network. When processing a call, the DMS switch may access many tables to collect the data needed to complete the call.

A table consists of horizontal rows and vertical columns of data. Each row contains one record of data and is called a tuple. Each column is called a field. in the 1st figure illustrates the terminology used to describe a table.

Figure 3-7 Diagram of translations terms



## Terms used in translations

### data

Tables contain data. Each field or subfield has a specific value that is valid for that field. For example, a field called **SECONDS** may accept integer values from 0 to 60. The set of all possible data values for a field is known as the range of the field.

### datafill

Datafill is the process of entering data into a table. The term also refers to the data in the table.

### field

A field is one column of a table. Each field has a name that describes the content of the field.

**key field**

Each table has a key field or fields. The key fields in a table are those fields that can uniquely identify any tuple in the table. They are important when using the table editor.

**range**

The range of a field is the set of data values that you can enter in the field. For example, a field called NUMBER may have a range of 1 to 20. RANGE is also a command that you can enter at the switch to determine the range of the table or field.

**subfield**

Some fields are made of several subfields. For example, in table C7NETSSN, field SSNAMES contains two subfields: SSNAME and SSNUMBER.

**table editor**

The table editor is the user interface to the translation database. It allows the user to view tables, add or delete tuples, and change data in tuples.

**tuple**

A tuple is one row in a table.

**Using the table editor to modify datafill**

The operating company makes routine changes and additions to datafill as required by using the table editor facility at the MAP (maintenance and administration position).

Enter the table editor from the command interpreter (CI) level of the MAP display by using the command TABLE followed by the table name.

Inside the table editor, the command LIST displays all the tuples in the table or only those tuples that meet specific conditions.

A variety of commands are used to modify the information contained in a table.

The table editor can also be used to add and delete tuples. For complete information on using the table editor, refer to *Basic Translations Tools Guide*, 297-1001-360.

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## 4 Introduction to SMB translations

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### Understanding SMB translations

This chapter describes SuperNode Multicomputing Base (SMB) application processor and file processor translations.

Application processors (AP) and file processors (FP) are computing module-based processors that provide additional processing and storage capabilities to the DMS-100 family of switches.

APs and FPs are based on the DMS-core architecture. Processing engines are built from three basic card types: processors, DMS-bus interfaces, and either memory or peripheral interfaces. All engines require a processor and an interface to the DMS-bus as well as some memory for program store (PS).

The processing engines are generally referred to as APs. These processors can be provisioned with or without mass storage devices. In the case of an FP, which is an AP with mass storage, one of the memory expansion slots provides an interface to the storage peripheral modules (PM).

The FP connection to disks is made with an industry standard SCSI bus. Twelve peripheral devices can be installed on FPs. The devices can be a mix of disks and tapes. The packaging supports either up to four disks or up to four cartridge tapes in a peripheral device shelf. The peripheral shelf is provisioned independently, but resides in the same cabinet as the FP associated with the peripherals.

The AP provides a computing environment that adds extra processing capacity to the switch. The AP is also capable of running a foreign operating system and provides the base for the FP. The AP is a provisionable environment, in the sense that more APs can easily be added to the system to improve performance.

The FP incorporates a multiported buffer memory and two SCSI bus interfaces on each plane of the duplex processor. The buffer memory is shared among the processor and the SCSI interfaces. The buffer memory passes commands to the SCSI interfaces and holds the data going to and from the disk.

The FP provides the following benefits to SuperNode based products:

- reduced DMS-core real-time load. The multicomputing environment provides facilities to more non-critical programs from the core.
- basis for future applications. The fault tolerant computing environment can form the basis for new applications and services.

The AP and the FP are based on the same hardware, therefore the software and maintenance bases are common. While AP maintenance is responsible for maintaining all base hardware in the FP such as the CPU, the memory and the port cards, FP maintenance is solely responsible for the maintenance of device-related hardware.

The AP and FP equipment may co-exist with the I/O controller (IOC) equipment. The choice of using either set of equipment is application dependant.

## **Signaling for SMB translations**

Not applicable.

## **Preparing to datafill SMB translations**

The operating company makes routine changes, additions, and modifications to the datafill in individual tables as required, using the table editor facility at the MAP (maintenance and administration position).

The table editor is accessed from the CI level of the MAP display using the command TABLE followed by the table name.

Inside the table editor, the LIST command displays all the tuples in the table or only those tuples that meet specific conditions.

A variety of commands are used to modify the information contained in a table.

The table editor can also be used to add and delete tuples.

## **Functional groups for SMB translations**

The following paragraphs provide functional group names, ordering codes, and prerequisites for SMB translations.

### **SMB translations**

To operate, SMB translations requires the following functional groups:

- BASE0001
- TEL00001

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## Application and file processors

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### Ordering codes

Functional group ordering code: TEL00001

### Release applicability

TL02 and up

### Prerequisites

To operate, Application and file processors has the following prerequisites:

- BASE0001
- TEL00001

### Description

Application processors (AP) and file processors (FP) are computing module-based processors that provide additional processing and storage capabilities to the DMS-100 family of switches. Refer to the Datafilling application base and file processor section of this document for more information.

### Operation

Table APINV contains information about the specified processor. Either an AP or an FP must be datafilled in this table. The loadname, previously datafilled in table PMLOADS, must be entered here as well.

For each AP designated in table APINV, ten tuples are added to table APCDINV to describe all the cards. For each FP, 12 tuples are added. The cards include the following:

- power converters
- CPU and reset terminal interface (RTIF) card
- memory cards
- bus terminators
- dual access buffer memory (DABM) cards
- small computer systems interface (SCSI) cards

Tables FPDIPINV and FPDEVINV identify the devices and cards on the FP, and describe their location and hardware configuration.

## **Application and file processors** (continued)

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### **Translations table flow**

The Application and file processors translations tables are described in the following list:

- table PMLOADS
- table APINV
- table APCDINV
- table FPDIPINV
- table FPDEVINV
- table SHADOW

The Application and file processors translation process is shown in the flowchart that follows.

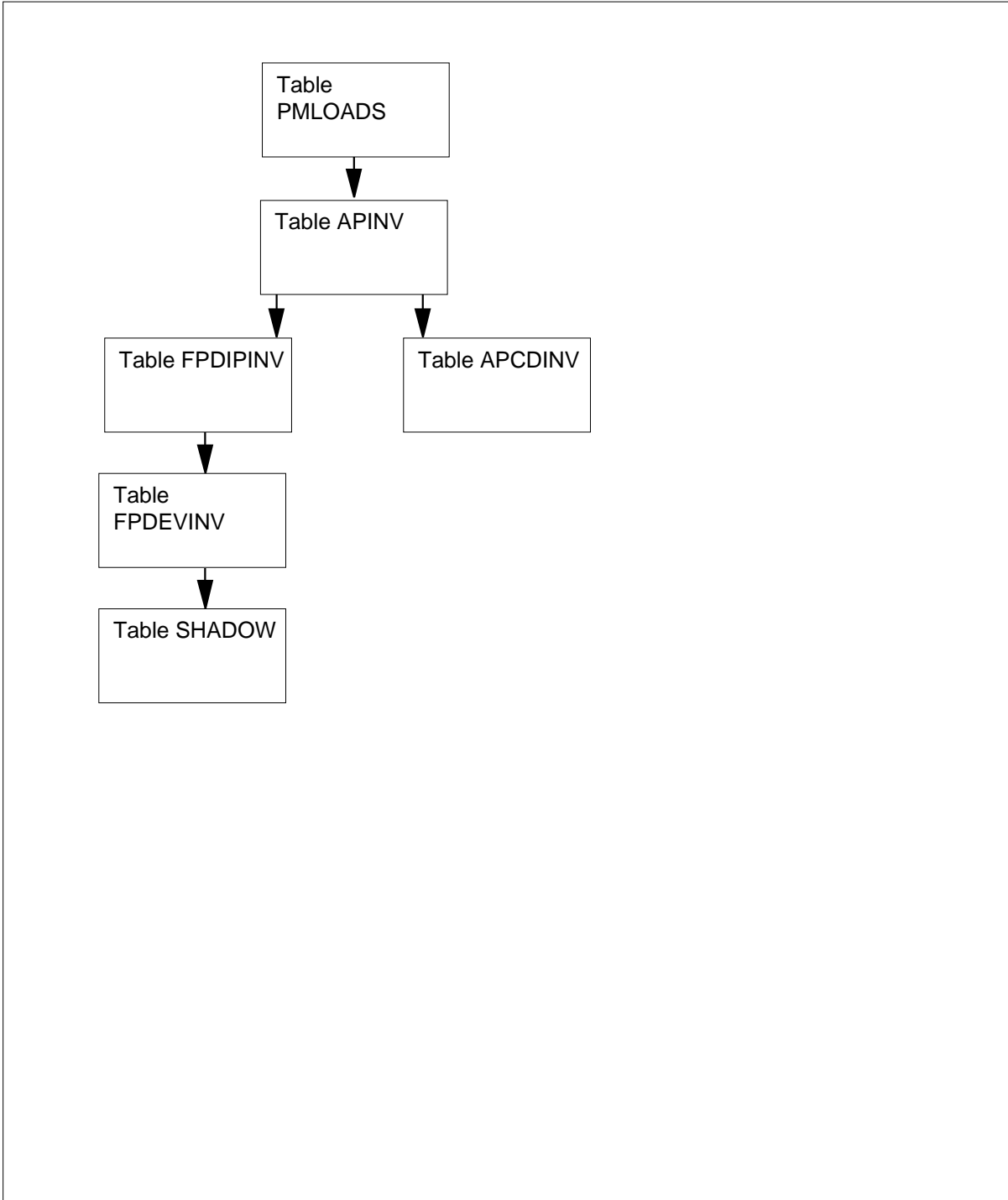


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## Application and file processors (continued)

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Table flow for Application and file processors



## Application and file processors (continued)

The following table lists the datafill content used in the flowchart.

### Datafill example for Application and file processors

Datafill table	Example data
PMLOADS	FPX35BL S01DIMAGE4
APINV	FP 0 FP0_R256 FPX35BL N 1 Y 6 0 NT9X81AA 1 R128 (12 0 0 12 0) (15 0 1 12 0) (12 1 1 12 0) (15 1 0 12 1) \$
APCDINV	FP 0 0 1 POWER NTDX15AA NIL NIL FP 0 0 4 POWER NTDX15AA NIL NIL FP 0 0 8 MEMORY NT9X14DB TERM NT9X21AB FP 0 0 9 MEMORY NT9X14DB NIL NIL FP 0 0 10 MEMORY NT9X14DB PORT NT9X88AA FP 0 0 11 MEMORY NT9X87AA PORT NT9X88AA FP 0 0 12 PORT NT9X86AA PORT NT9X62AA FP 0 0 13 CPU NT9X13LA TIF NT9X26CA FP 0 0 14 CPU NT9X13LA TIF NT9X26CA FP 0 0 15 PORT NT9X86AA PORT NT9X62AA FP 0 0 16 MEMORY NT9X87AA PORT NT9X88AA FP 0 0 17 MEMORY NT9X14DB PORT NT9X88AA FP 0 0 18 MEMORY NT9X14DB NIL NIL FP 0 0 19 MEMORY NT9X14DB TERM NT9X21AB
FPDIPINV	0 0 0 3 NT9X83AA 1 Y 9 (0 8 NT9X89BA) (1 9 NT9X89BA) \$
FPDEVINV	0 0 0 DK NT9X90AA 0 0 3 NT9X83AA 1 Y 9
SHADOW	FP 0 SS00 SCSIDK 0 3 \$

### Limitations and restrictions

The following limitations and restrictions apply to Application and file processors when a device is datafilled in table FPDEVINV:

- The SCSI interface paddle boards (SIP) inserted in slots 11R, 16R, 23R, and 28R correspond to SCSI bus 0, by default. The optional SIPs in slots 10R, 17R, 22R, and 29R correspond to SCSI bus 1.
- The processor portion of the FP must be datafilled first in table APINV.

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## Application and file processors (continued)

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- The SDIPs the device is being attached to must be datafilled in table FPDIPINV.
- The power converters and the SIPs corresponding to the SCSI bus the device is being attached to must be datafilled in table APCDINV. If any of these cards are not datafilled, a error is displayed indicating that a card has not been datafilled, and the device is not added to the table.

Before a device can be deleted from table FPDEVINV, it must be in the offline state.

### Interactions

The following paragraphs describe the interactions between Application and file processors and other functionalities.

- Table Control for CM-based Application Processors
- FP Central Maintenance Base
- FP Local Control

Table control for CM-based application processors datafills an AP or FP. FP central maintenance base describes the FP maintenance software, and FP local control datafills SDIPs attached to a device.

### Activation/deactivation by the end user

Application and file processors requires no activation or deactivation by the end user.

### Billing

Application and file processors does not affect billing.

### Station Message Detail Recording

Application and file processors does not affect Station Message Detail Recording.

### Datafilling office parameters

Application and file processors does not affect office parameters.

## Application and file processors (continued)

### Datafill sequence

The following table lists the tables that require datafill to implement Application and file processors. The tables are listed in the order in which they are to be datafilled.

#### Datafill tables required for Application and file processors

Table	Purpose of table
PMLOADS	The peripheral module loads table stores the information on the device location of every PM load file and the mapping between the load names and devices they reside on.
APINV	The application processor inventory table identifies the type and instance of the APs and FPs on a DMS SuperNode switch.
APCDINV	The application processor card inventory table describes all RP cards.
FPDIPINV	The file processor SDIP table describes all SDIPs on an FP.
FPDEVINV	The file processor device table describes all devices installed on a DMS SuperNode FP.
SHADOW	The shadow table describes all shadow sets configured on a DMS SuperNode FP.

### Datafilling table PMLOADS

The following table shows the datafill specific to Application and file processors for table PMLOADS. Only those fields that apply directly to Application and file processors are shown. For a description of the other fields, refer to the data schema section of this document.

#### Datafilling table PMLOADS

Field	Subfield or refinement	Entry	Explanation and action
LOADNAME		alphanumeric (up to 32 characters)	Peripheral module load name. Enter up to a 32 character XPM load name.
DEV		vector of up to 16 characters	Device name. Enter the storage device that contains the PM load. This is a vector of up to 16 characters in length.

### Datafill example for table PMLOADS

The following example shows sample datafill for table PMLOADS.

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## Application and file processors (continued)

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### MAP display example for table PMLOADS

LOADNAME	DEV
FPX35BJ	S00DVOL2

### Error messages for table PMLOADS

The following error messages apply to table PMLOADS.

#### Error messages for table PMLOADS

Error message	Explanation and action
Could not add node to DDM.	A software error has occurred. The node was not added to the distribute data manager (DDM). Check the logs and if necessary contact next level of support.
Could not allocate node < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Could not allocate ports < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Could not convert to the NNT node name.	A software error has occurred. The node was not added to the node name type (NNT). Check the logs and if necessary contact next level of support.

### Datafilling table APINV

The following table shows the datafill specific to Application and file processors for table APINV. Only those fields that apply directly to

## Application and file processors (continued)

Application and file processors are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table APINV (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
SMNTYPE		AP or FP	Sync-matched node type Enter the type of processor, as follows: <ul style="list-style-type: none"> <li>For the application processor, enter AP.</li> <li>For the file processor, enter FP.</li> </ul>
SMNO		0 to 99	Sync-matched node instance number. Enter a number from 0 to 99 to specify the instance of the processor.
FUNCTION		1 to 12	Sync-matched node function. Enter a string of 1 to 12 alphanumeric characters to specify the function of the processor on a MAP display.
LOADNAME		1 to 8	Default load file name. Enter a string of one to eight alphanumeric characters. This loadname must be datafilled in table PMLOADS and must reside on a permanent device, not a tape device.
SELFLOAD		Y or N	Self-loading capability. Enter Y or N to specify whether the processor has self-loading capability.
FLOOR		0 to 99	Floor. Enter a number from 0 to 99 to specify the floor the cabinet containing the processor is located on.
ROW		A to Z or AA to ZZ, excluding I, O, II and OO	Row. Enter one or two alphanumeric characters from A to Z, or AA to ZZ, excluding I, O, II, and OO, to specify the row position of the cabinet containing the processor.
FRAME		0 to 99	Frame position. Enter a number from 0 to 99 to specify the frame position in the row containing the processor.
SHELF		0 to 3	Device shelf. Enter a number from 0 to 3 to specify the shelf containing the processor. The shelves are numbered from top to bottom, beginning with 0.

## Application and file processors (continued)

Datafilling table APINV (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
SHELFPEC		NT9X81AA	Shelf product engineering code (PEC). Enter NT9X81AA to specify the PEC of the processor shelf.
QUADRANT		0 or 1, or 2 or 3	<p>Quadrant range</p> <p>Enter the quadrant range in which the processor is located, as follows:</p> <ul style="list-style-type: none"> <li>• For the first quadrant range, enter 0 or 1.</li> <li>• For the second quadrant range, enter 2 or 3.</li> </ul>
LINKRATE		R64, R128, R256, or DS512	Link rate. Enter R64, R128, R256, or DS512 to specify the bandwidth on the fiber connecting the processor to the DMS-bus. The default value is R128.
LINKS		\$	SMN port configuration. This field is a vector of up to four multiples of subfields TCTARDNO, TLINKNO, DNODENO, DCARDNO, and DLINKNO. Enter a dollar (\$) sign to indicate the end of the vector.
	TCARDNO	1 to 38	Terminating card number. Enter a number from 1 to 38 to specify the card of the terminating link on the node.
	TLINKNO	0 or 1	Terminating link number. Enter 0 or 1 to specify the terminating link on the node corresponding to the card (TCARDNO) the link terminates on.
	DNODENO	0 or 1	DMS-bus node number. Enter 0 or 1 to specify the message switch (MS) node that the link is connected to.
	DCARDNO	1 to 26	DMS-bus card number. Enter a number from 1 to 26 to specify the shelf location of the MS card that is connected to this AP or FP.
	DLINKNO	0 to 7	DMS-bus link number. Enter a number from 0 to 7 to specify the link number of the MS card that is connected to this AP or FP.

### Datafill example for table APINV

The following examples show sample datafill for table APINV.

## Application and file processors (continued)

### MAP display example for table APINV

SMNTYPE	SMNO	FUNCTION	LOADNAME	SELFLOAD
FLOOR	ROW	FRAME	SHELF	SHELFPEC
LINKRATE	LINKS		QUADRANT	
FP	0	FP0_R256	FPX35BL	N
1	Y	6	0	NT9X81AA
				1
R256	(12	0 0	12 0)	(15 0 1 12 0)
	(12	1 1	12 1)	(15 1 0 12 1) \$

### MAP display example for table APINV

SMNTYPE	SMNO	FUNCTION	LOADNAME	SELFLOAD
FLOOR	ROW	FRAME	SHELF	SHELFPEC
LINKRATE	LINKS		QUADRANT	
AP	4	AP4_R128	APX35BL	N
1	D	4	0	NT9X81AA
				1
R128	(12	0 0	15 1)	(15 0 1 15 1)
	(12	1 1	16 1)	(15 1 0 16 1) \$

### Error messages for table APINV

The following error messages apply to table APINV.

#### Error messages for table APINV (Sheet 1 of 9)

Error message	Explanation and action
Could not add node to DDM.	A software error has occurred. The node was not added to the distribute data manager (DDM). Check the logs and if necessary contact next level of support.
Could not allocate node < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Could not allocate ports < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Could not convert to the NNT node name.	A software error has occurred. The node was not added to the node name type (NNT). Check the logs and if necessary contact next level of support.



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**Application and file processors** (continued)
 

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**Error messages for table APINV (Sheet 2 of 9)**

Error message	Explanation and action
Could not deallocate smn databases < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Could not delete the mchid < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Could not register with MAP.	A software error has occurred. The node was not added to MAP control. Check the logs and if necessary contact next level of support.
Could not register with System Recovery.	A software error has occurred. The node was not added to system recovery. Check the logs and if necessary contact next level of support.
Data Inconsistency: Failed to allocate far end MCHID	A software error has occurred. Check the logs and if necessary contact next level of support.
Data Inconsistency: Failed to allocate MCHID < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data Inconsistency: Failed to convert to mtcid.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data Inconsistency: Failed to define ILM far end link < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data inconsistency: Failed to define ILM Link < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data Inconsistency: Failed to define ILM port < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data inconsistency: failed to delete node from system.	Further error messages will identify the problem. Check the logs and if necessary contact next level of support.

## Application and file processors (continued)

### Error messages for table APINV (Sheet 3 of 9)

Error message	Explanation and action
Data Inconsistency: Failed to get ILM far port.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data Inconsistency: Failed to get TC Tuple info.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data inconsistency: failed to properly deallocate cards.	A software error has occurred. It was not possible to automatically deallocate cards from the APCDINV table. Manually deallocate the cards from table APCDINV. If this is not possible, check the logs. If necessary contact next level of support.
Data inconsistency: failed to properly deallocate links.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data inconsistency: failed to properly deallocate node.	Further error messages will identify the problem. Check the logs and if necessary contact next level of support.
Data inconsistency: failed to re-register with INM.	A software error has occurred. Check the logs and if necessary contact next level of support.
Data inconsistency: link does not exist.	The link entered does not exist. Check the link entered and re-enter or enter link in table MSCDINV and re-enter link datafill.
Data inconsistency: node does not exist.	The node entered has already been deleted or has never existed. Check the node entered and re-enter if necessary.
Data inconsistency: node name corrupted.	A software error has occurred. Re-enter node name and check the logs. If necessary contact next level of support.
Deregistration data inconsistency: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.

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**Application and file processors** (continued)
 

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**Error messages for table APINV (Sheet 4 of 9)**

Error message	Explanation and action
Each CPU must have a connection to each MS.	Each message switch must have two links to each CPU. Check the link configuration and correct or add links.
Failed to add all the MCHID < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to allocate address: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to allocate default cards.	Further error messages will identify the problem. Check the logs and if necessary contact next level of support.
Failed to allocate point code: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to convert to a MTC ID.	A software error has occurred. The node was not added to the maintenance ID. Check the logs and if necessary contact next level of support.
Failed to create name to delete node from the DDM.	A software error has occurred. The node was not deleted from the DDM. Check the logs and if necessary contact next level of support.
Failed to create node name: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to create node names.	A software error has occurred. The node was not deleted from the DDM. Check the logs and if necessary contact next level of support.
Failed to deallocate address: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to deallocate PC: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.

## Application and file processors (continued)

### Error messages for table APINV (Sheet 5 of 9)

Error message	Explanation and action
Failed to delete far end Link ID.	A software error has occurred. Failed to delete or free for use the link from the MS to the AP or FP. Check the logs and if necessary contact next level of support.
Failed to delete far end MCHid.	A software error has occurred. Failed to delete or free for use the MS end of the connection to the AP or FP. Check the logs and if necessary contact next level of support.
Failed to delete far end Port ID.	A software error has occurred. Failed to delete or free for use the port on the MS card. Check the logs and if necessary contact next level of support.
Failed to delete Link ID< >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to delete Link ID.	A software error has occurred. Failed to delete or free for use the AP/FP end of the connection to the MS. Check the logs and if necessary contact next level of support.
Failed to delete MCHid < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to delete node name: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to delete Port ID < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to delete port transport access < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to get port transport access < >.	A software error has occurred. Check the logs and if necessary contact next level of support.

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**Application and file processors** (continued)

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**Error messages for table APINV (Sheet 6 of 9)**

Error message	Explanation and action
Failed to get signalling address.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failed to identify node to System Rex Controller.	A software error has occurred. The node was not added to the REX. Check the logs and if necessary contact next level of support.
Failed to remove from System Rex Controller.	A software error has occurred. The node was not deleted from the routine exercise test (Rex). Check the logs and if necessary contact next level of support.
Failed to remove node from DMS-bus.	A software error has occurred. The node was not deleted from the DMS-bus. Check the logs and if necessary contact next level of support.
Failed to validate the tc data < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Failure on adding to the DMS-bus.	A software error has occurred. The node was not added to the DMS-bus. Check the logs and if necessary contact next level of support.
Illegal change: link rate cannot not be changed. Please delete and re-add.	The change entered is not allowed. To change the link rate, delete the node and re-enter the new information.
Illegal change: Location (location, quadrant) is already occupied by another AP/FP.	The quadrant number entered is incorrect. Quadrants are numbered 0 or 2. Re-enter quadrant number.
Illegal change: nodes may not be relocated on a shelf. Please delete and re-add.	The change entered is not allowed. To change the node position on the shelf, the tuple must be deleted and re-entered for the new position.

## Application and file processors (continued)

### Error messages for table APINV (Sheet 7 of 9)

Error message	Explanation and action
Illegal change: quadrant location cannot be changed. Please delete and re-add.	The change entered is not allowed. To change the quadrant, the tuple must be deleted and re-entered for the new quadrant.
Illegal change: shelf types may not be changed. Please delete and re-add.	The change entered is not allowed. To change the shelf type, the tuple must be deleted and re-entered for the new shelf type.
Illegal change: Sync-matched nodes requires 4 links to the DMS-bus.	The change entered is not allowed. You must have four links to the DMS-bus. Check the link configuration and re-enter if necessary.
Inconsistency: Failed to deallocate all resources from node.	A software error has occurred. Check the logs and if necessary contact next level of support.
Inconsistency: Illegal quadrant input.	The quadrant number entered is incorrect. Quadrants are numbered 0 or 2. Re-enter quadrant number.
Inconsistent information in database.	A software error has occurred. Check the logs and if necessary contact next level of support.
INM registration failed: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
INM update failed: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Invalid shelf configuration.	The shelf number entered is incorrect. Shelves are numbered 0 to 3. Re-enter shelf number.
Invalid shelf PEC.	The shelf PEC entered is incorrect. NT9X81AA and NT9X06AA are supported shelf PECs. Re-enter shelf PEC.

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**Application and file processors** (continued)

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**Error messages for table APINV (Sheet 8 of 9)**

Error message	Explanation and action
Invalid sync-matched node class.	The sync-matched node class entered is incorrect. Supported classes are AP or FP. Re-enter class.
Link datafill is not consistent with the NT9X06AA shelf configuration.	The NT9X06AA shelf cannot support the link entered. Check the node and link configuration and re-enter if necessary.
Link datafill is not consistent with the NT9X81AA shelf configuration for the quadrant.	The NT9X81AA shelf cannot support the link entered. Check the node and link configuration and re-enter if necessary.
Link rate specified not supported	The line rate entered is not supported, enter a supported rate.
Load file <file_name> is not equipped in table PMLOADS.	The <file_name> is not entered in table PMLOADS. Check the file name entered and re-enter or enter the file name in table PMLOADS and re-enter the datafill.
Location (location, quadrant) is already occupied by another AP/FP.	The quadrant number entered is incorrect. Quadrants are numbered 0 or 2. Re-enter quadrant number.
Logical links must terminate on same card/port on MS.	The two MSs do not have identical connections. Check the MS link configuration and make the necessary changes.
Not a valid node < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
No valid ports on node < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Problems deallocating default cards.	A software error has occurred. Check the logs and if necessary contact next level of support.

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**Application and file processors** (continued)
 

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**Error messages for table APINV (Sheet 9 of 9)**

Error message	Explanation and action
Sync-matched nodes required 4 links to the DMS-bus.	The change entered is not allowed. You must have four links to the DMS-bus. Check the link configuration and re-enter if necessary.
Unable to add/change node to/in INMDMITB: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
Unable to delete node from INMDMITB: < >.	A software error has occurred. Check the logs and if necessary contact next level of support.
WARNING: Data not updated in local node database.	A software error has occurred. Bring the node to service. If the node is in service, check the logs and if necessary contact next level of support.
WARNING: No buffers available to update data in local node.	A software error has occurred. Check the logs and if necessary contact next level of support.
WARNING: The loadfile is not registered correctly in table PMLOADS.	The loadfile is not entered in table PMLOADS. Check the tuple entered and re-enter or enter the loadfile in table PMLOADS and re-enter the tuple.

**Datafilling table APCDINV**

The following table shows the datafill specific to Application and file processors for table APCDINV. Only those fields that apply directly to



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## Application and file processors (continued)

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Application and file processors are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table APCDINV (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
SMNTYPE		AP or FP	<p>Sync-matched node type.</p> <p>Enter the type of processor as follows:</p> <ul style="list-style-type: none"> <li>• For the AP, enter AP.</li> <li>• For the FP, enter FP.</li> </ul>
SMNO		0 to 99	Sync-matched node instance number. Enter a number from 0 to 99 to specify the instance of the processor.
SHELF		0 to 3	Device shelf. Enter a number from 0 to 3 to specify the shelf containing the RP. The shelves are numbered from top to bottom, beginning with 0.
SLOT		1 to 38	System slot. Enter a number from 1 to 38 to specify the slot containing the card.
FRONTCRD		CPU, PORT, MEMORY, POWER or NIL	Front card. Enter CPU, PORT, MEMORY, POWER, or NIL, to specify the type of card in the front card slot.
FRONTPEC		NT9X13LA, NTX86AA, NT9X14DA, NT9X14DB, NT9X87AA, NT9X91AA, or NIL	<p>Front PEC. This field defines the PEC of the card in the front card slot.</p> <p>If the entry in field FRONTCRD is CPU, enter NT9X13LA.</p> <p>If the entry in field FRONTCRD is PORT, enter NTX86AA.</p> <p>If the entry in field FRONTCRD is MEMORY, enter NT9X14DA, NT9X14DB, or NT9X87AA.</p> <p>If the entry in field FRONTCRD is POWER, enter NT9X91AA or NTDX15AA.</p> <p>If the entry in field FRONTCRD is NIL, enter NIL.</p>

## Application and file processors (continued)

### Datafilling table APCDINV (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
BACKCRD		PORT, TERM, TIF, or NIL	Back card. Enter PORT, TERM, TIF, or NIL, to specify the type of card in the front card slot.
BACKPEC		NT9X62AA or NT9X88AA, NT9X21AB, NT9X26AA, NT9X26BA, or NT9X26CA, or NIL	Back product equipment code. This field defines the PEC of the card in the back card slot.  If the entry in field BACKCRD is PORT, enter NT9X62AA or NT9X88AA.  If the entry in field BACKCRD is TERM, enter NT9X21AB.  If the entry in field BACKCRD is TIF, enter NT9X26AA, NT9X26BA, or NT9X26CA.  If the entry in field BACKCRD is NIL, enter NIL.

### Datafill example for table APCDINV

The following examples show sample datafill for table APCDINV.

In the example, the processor is an FP. The cards contained in slots

- 1 and 4 are power converters
- 8 and 19 are bus terminators
- 9 and 18 are memory cards
- 10 and 17 are SIPs
- 11 and 16 are DABM cards
- 12 and 15 are port cards
- 13 and 14 are the CPU in the front and the RTIF in the back, respectively

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**Application and file processors (continued)**


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**MAP display example for table APCDINV**

SMNTYPE	SMNO	SHELF	SLOT	FRONTCRD	FRONTPEC	BACKCRD	BACKPEC
AP	0	0	1	POWER	NTDX15AA	NIL	NIL
AP	0	0	4	POWER	NTDX15AA	NIL	NIL
AP	0	0	8	MEMORY	NT9X14DB	TERM	
NT9X21AB							
AP	0	0	9	MEMORY	NT9X14DB	NIL	NIL
AP	0	0	10	MEMORY	NT9X14DB	PORT	
NT9X88AA							
AP	0	0	11	MEMORY	NT9X87AA	PORT	
NT9X88AA							
AP	0	0	12	PORT	NT9X86AA	PORT	
NT9X62AA							
AP	0	0	13	CPU	NT9X13LA	TIF	
NT9X26AB							
AP	0	0	14	CPU	NT9X13LA	TIF	
NT9X26AB							
AP	0	0	15	PORT	NT9X86AA	PORT	
NT9X62AA							
AP	0	0	16	MEMORY	NT9X87AA	PORT	
NT9X88AA							
AP	0	0	17	MEMORY	NT9X14DB	PORT	
NT9X88AA							
AP	0	0	18	MEMORY	NT9X14DB	NIL	NIL
AP	0	0	19	MEMORY	NT9X14DB	NIL	NIL

**Error messages for table APCDINV**

The following error messages apply to table APCDINV.

**Error messages for table APCDINV (Sheet 1 of 4)**

Error message	Explanation and action
DABM PECs can not be datafilled on an Application Processor.	Data buffer memory (DABM) is only available for FPs, it is not applicable to APs. Check the processor entered and re-enter.
Data inconsistency: Invalid back PEC.	The back slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.

## Application and file processors (continued)

### Error messages for table APCDINV (Sheet 2 of 4)

Error message	Explanation and action
Data inconsistency: Invalid front PEC.	The front slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.
Data Inconsistency: Invalid shelf PEC.	The shelf number entered is incorrect. Shelves are numbered 0 to 3. Re-enter shelf number.
Data Inconsistency: node does not exist.	The code entered for addition to an AP or FP is not entered in table APINV. Check that the code entered is correct and re-enter or enter code into table APINV and try again.
DDM index not found: < >.	A software error involving the DDM has occurred. Check the logs and if necessary contact next level of support.
Error: Only power converters can be configured in this location.	The slot entered only supports power converter cards. Check the slot number entered and re-enter or select another slot.
Inconsistency: Failed to allocate card database.	A software error has occurred. If directed by logs to re-enter, check the logs. If message repeats or logs do not direct you to re-enter, contact next level of support.
Inconsistency: Failed to delete card data.	The card to be deleted has been datafilled and some of the card resources could not be removed. Check the logs and if necessary contact the next level of support.
Inconsistency: invalid card operation.	The operation or type of change entered is not allowed for the card. Valid operations are add, change, or delete. Check the operation entered and re-enter.
Inconsistency: PEC deleted.	The PEC code entered is no longer supported. Enter another PEC code.

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## Application and file processors (continued)

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### Error messages for table APCDINV (Sheet 3 of 4)

Error message	Explanation and action
Inconsistency: PEC deleted and is no longer valid.	The PEC code entered is no longer supported. Enter another PEC code.
Illegal: Cannot delete a non-optional card.	The operation entered would remove a card required for correct operation. Check the card entered and re-enter or remove another card.
Illegal: Cannot delete last DRAM card on this plane.	The operation entered would remove the last DRAM card on the plane. For correct operation, at least one DRAM card must be on the plane. Check the card entered and re-enter or remove another card.
Illegal: Cannot delete the last memory card on this plane.	The operation entered would remove the last memory card on the plane. For correct operation at least one memory card must be on the plane. Check the card entered and re-enter or remove another card.
Illegal change: Back cardtype is a default card and cannot be changed.	The back slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.
Illegal change: Front cardtype is a default card and cannot be changed.	The front slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.
Illegal slot configuration for actual card location.	The slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.
Inconsistency: Failed to update card database.	A software error has occurred. If directed by logs to re-enter, check the logs. If message repeats or logs do not direct you to re-enter, contact next level of support.

## Application and file processors (continued)

### Error messages for table APCDINV (Sheet 4 of 4)

Error message	Explanation and action
Inconsistency: No card data.	The card selected has not been entered into this table. Check the card selected, and re-enter or enter the card into this table and repeat the operation.
Invalid class.	The class entered is not supported. Enter AP or FP.
Invalid back PEC provided.	The back slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.
Invalid front PEC provided.	The front slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.
Not a valid card < >.	The slot entered only supports certain card types. Check the slot number entered and re-enter or select another slot.
SIP PECs can not be datafilled on an Application Processor.	The card entered is only available for FPs, it is not applicable to APs. Check the processor entered and re-enter.
Slot already occupied by another card.	Another card has already been specified for the slot entered. Check the slot number entered and re-enter or remove the other card and re-enter.
WARNING: Data not updated in local node database.	A software error has occurred. Bring the node to service. If the node is in service, check the logs and if necessary contact next level of support.
WARNING: No buffers available to update data in local node.	A software error has occurred. Check the logs and if necessary contact next level of support.

### Datafilling table FPDIPINV

The following table shows the datafill specific to Application and file processors for table FPDIPINV. Only those fields that apply directly to

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## Application and file processors (continued)

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Application and file processors are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table FPDIPINV (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
FPNO		0 to 99	FP instance number. Enter a number from 0 to 99 to specify the FP.
SCSIBUS		0 or 1	SCSI bus number. Enter 0 or 1 to specify the bus on the FP where the device is attached.
SDIPNO		0 to 5	SDIP number. Enter a number from 0 to 5 to specify the SDIP pairs on the SCSI bus.
SHELF		0 to 3	Device shelf. Enter a number from 0 to 3 to specify the shelf containing the device. The shelves are numbered from top to bottom, beginning with 0.
SHELFPEC		NT9X83AA	Shelf PEC. Enter NT9X83AA to specify the PEC for the device shelf.
FLOOR		0 to 99	Floor. Enter a number from 0 to 99 to specify the floor the frame containing the device is on.
ROW		one or two alphanumeric characters from A to Z, or AA to ZZ, excluding I, O, II, and OO,	Row. Enter one or two alphanumeric characters from A to Z, or AA to ZZ, excluding I, O, II, and OO, to specify the row position of the frame containing the device.
FRAME		0 to 99	Frame position. Enter a number from 0 to 99 to specify the frame position in the row containing the device.
DIPIDS		\$	Device interface paddle board identification. This field is a vector of up to two multiples of subfields CTRLNO, SLOTNO, and DIPPEC. See the appropriate subfields for definitions. Enter \$ to signify the end of the vector.
	CTRLNO	0 or 1	Controller number . Enter 0 or 1 to specify the SCSI bus controller where the SDIP is attached.

## Application and file processors (continued)

### Datafilling table FPDIPINV (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	SLOTNO	1 to 38	Slot number. Enter a number from 1 to 38 to specify the slot where the SDIP is located. SDIPs must be in adjacent slot numbers. Valid slot numbers are: (8,9), (14,15), (20, 21), (26,27).
	DIPPEC	NT9X89AA or NT9X89BA	SDIP PEC. Enter NT9X89AA or NT9X89BA to specify the PEC of the SDIP.

### Datafill example for table FPDIPINV

The following examples show sample datafill for table FPDIPINV.

### MAP display example for table FPDIPINV

FPNO	SCSIBUS	SDIPNO	SHELF	SHELFPEC	
FLOOR	ROW	FRAME			
DIPIDS					
0	0	0	3	NT9X83AA	
1	A	3			
(0	8	NT9X89AA)	(1	9 NT9X89AA)	\$

### Error messages for table FPDIPINV

The following error messages apply to table FPDIPINV.

### Error messages for table FPDIPINV (Sheet 1 of 3)

Error message	Explanation and action
FPDIPINV ERROR: SDIPs not added. Invalid FP node.	An attempt to add an SDIP without datafilling an FP node in table APINV will be rejected. First enter the FP node in table APINV.
FPDIPINV WARNING: No SCSI bus paddle boards are datafilled in table APCDINV.	The request to datafill the SDIP is accepted, but is not operational until the missing hardware is datafilled in table APCDINV.
FPDIPINV ERROR: Invalid SDIP PEC.	The SDIP PEC is invalid.



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## Application and file processors (continued)

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### Error messages for table FPDIPINV (Sheet 2 of 3)

Error message	Explanation and action
FPDIPINV ERROR: Field changes valid only to SDIPs PECs.	Only the PEC can be changed. Other field changes can be made only by deleting the tuple and adding a new one.
FPDIPINV ERROR: Shelf and quadrant already equipped.	Shelf and quadrant have already been datafilled with another SDIP.
FPDIPINV ERROR: Shelf and quadrant already equipped with AP.	The shelf and quadrant have already been equipped in table APINV.
FPDIPINV ERROR: Unexpected error. Check logs.	Software error. Check logs for explanation.
FPDIPINV ERROR: Could not read SDIP data.	Data cannot be read due to error in the software.
FPDIPINV ERROR: 2 sets of DIP identifiers (DIPIDS) must be defined.	There must be two SDIPs per device. Datafill the second SDIP.
FPDIPINV ERROR: Valid SLOTNO are: (8,9), (14, 15), (20, 21), (26, 27)	There is an incorrect number entered in field SLOTNO.
FPDIPINV ERROR: Both SLOTNOs must belong to the same quadrant.	There must be two SDIPs for each quadrant.
FPDIPINV ERROR: SLOTNO must be different for each SDIP.	The number entered in field SLOTNO has already been allocated to another SDIP.
FPDIPINV ERROR: CTRLNO must be different for each SDIP.	The number entered in field CTRLNO has already been allocated to another SDIP.
FPDIPINV ERROR: SDIPs not added. Could not write SDIPs data.	The add operation is rejected due to an error in the software.
FPDIPINV ERROR: SDIPs not added. Could not allocate store for data.	The add operation is rejected due to an error in the software.

## Application and file processors (continued)

### Error messages for table FPDIPINV (Sheet 3 of 3)

Error message	Explanation and action
FPDIPINV ERROR: SDIPs not deleted. Delete device first in table FPDEVINV.	The device must first be deleted in table FPDEVINV.
FPDIPINV ERROR: SDIPs not deleted. Could not delete SDIPs data.	FPDIPINV ERROR: SDIPs not deleted. Could not delete SDIPs data.

### Datafilling table FPDEVINV

The following table shows the datafill specific to Application and file processors for table FPDEVINV. Only those fields that apply directly to Application and file processors are shown. For a description of the other fields, refer to the data schema section of this document.

### Datafilling table FPDEVINV (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
FPNO		0 to 99	FP instance number. Enter a number from 0 to 99 to specify the FP.
SCSIBUS		0 or 1	SCSI bus number. Enter a 0 or 1 to specify the bus on the FP where the device is attached.
DEVNO		0 to 5	Device instance number. Enter a number from 0 to 5 to specify the instance of the device type.
DEVTYPE		DK or CT	Device drive type. Enter the type of device drive, as follows: <ul style="list-style-type: none"> <li>• For disk, enter DK.</li> <li>• For tape, enter CT.</li> </ul>
DEVPEC		NT9X90AA, NT9X90AB, or NT9X90BA	Device drive PEC. Enter NT9X90AA (600-Mbyte disk), NT9X90AB (2.1-Gbyte disk), or NT9X90BA (1.3-Gbyte DAT) to specify the PEC of the device.
SCSIID		0 to 5	SCSI identifier. Enter a number from 0 to 5 to specify the SCSI bus identifier.
QUADNO		0 to 3	Quadrant number. Enter a number from 0 to 3 to specify the quadrant containing the device.

**Application and file processors** (continued)**Datafilling table FPDEVINV (Sheet 2 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
SHELF		0 to 3	Device shelf. Enter a number from 0 to 3 to specify the shelf containing the device. The shelves are numbered from top to bottom, beginning with 0.
SHELFPEC		NT9X83AA	Shelf PEC. Enter NT9X83AA to specify the PEC for the device shelf.
FLOOR		0 to 99	Floor. Enter a number from 0 to 99 to specify the floor where the frame containing the device is located.
ROW		one or two alphanumeric characters from A to Z, or AA to ZZ, excluding I, O, II, and OO	Row. Enter one or two alphanumeric characters from A to Z, or AA to ZZ, excluding I, O, II, and OO, to specify the row position of the frame containing the device.
FRAME		0 to 99	Frame position. Enter a number from 0 to 99 to specify the frame position in the row containing the device.

**Datafill example for table FPDEVINV**

The following examples show sample datafill for table FPDEVINV.

**MAP display example for table FPDEVINV**

FPNO	SCSIBUS	DEVNO	DEVTYPE	DEVPEC
SCSIID	QUADNO	SHELF	SHELFPEC	FLOOR
ROW	FRAME			
0	0	0	DK	NT9X90AA
0		0	3	NT9X83AA 1
A	3			

## Application and file processors (continued)

### Error messages for table FPDEVINV

The following error messages apply to table FPDEVINV.

#### Error messages for table FPDEVINV (Sheet 1 of 2)

Error message	Explanation and action
FPDEVINV ERROR: Device not added. Invalid FP node.	An attempt to add a device without datafilling an FP node in table APINV will be rejected. First enter the FP node in table APINV.
FPDEVINV ERROR: No device paddle boards are datafilled in table FPDIPINV.	An attempt to add a device without datafilling the paddle board in table FPDIPINV will be rejected. First enter the paddle board in table FPDIPINV.
FPDEVINV WARNING: No SCSI bus paddle boards are datafilled in table APCDINV.	The request to datafill the device is accepted, but is not operational until the missing hardware is datafilled in table APCDINV.
FPDEVINV ERROR: No device power converter is datafilled in table APCDINV.	An attempt to add a device without datafilling the associated power converter will be rejected. First enter the power converter in table APCDINV. Note that undatafilling the power converter subsequent to datafilling the device may result in a SWERR being generated.
FPDEVINV ERROR: Invalid device PEC.	The device PEC is invalid.
FPDEVINV ERROR: Invalid site name.	The entry in field SITE is incorrect.
FPDEVINV ERROR: Field changes valid only to device PECs.	Only the PEC can be changed. Other field changes can only be made by deleting the tuple and adding a new one.
FPDEVINV ERROR: Shelf and quadrant already equipped.	Shelf and quadrant have already been datafilled with another device.
FPDEVINV ERROR: Duplicate SCSI id on SCSI bus.	Each device must have a unique SCSI ID.
FPDEVINV ERROR: Unexpected error. Check logs.	Software error. Check logs for explanation.

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## Application and file processors (continued)

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### Error messages for table FPDEVINV (Sheet 2 of 2)

Error message	Explanation and action
FPDEVINV ERROR: Could not read device data.	Data cannot be read due to error in the software.
FPDEVINV ERROR: Device not added. Could not allocate store for data.	The add operation is rejected due to an error in the software.
FPDEVINV ERROR: Device not added. Could not write device data.	The add operation is rejected due to an error in the software.
FPDIPINV ERROR: Device not deleted. It must be offlined first.	The device must first be deleted in table FPDEVINV.
FPDIPINV ERROR: Device not deleted. Could not write device data.	The delete operation is rejected due to an error in the software.
FPDIPINV ERROR: No confirmation of offline status received from FP.	Device must be offline before it can be deleted.
FPDIPINV ERROR: Device not deleted. Could not confirm offline status data.	The links to the FP are down. There is no communication to the FP to check status.

### Datfilling table SHADOW

The following table shows the datafill specific to Application and file processors for table SHADOW. Only those fields that apply directly to Application and file processors are shown. For a description of the other fields, refer to the data schema section of this document.

#### Datfilling table SHADOW (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
NODETYPE		FP	Node type. Enter FP.
NODENO		0 to 99	Node number. Enter a number from 0 to 99 to specify the instance of the file processor (FP) node.

## Application and file processors (continued)

### Datafilling table SHADOW (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
SETNAME		alphanumeric string of up to eight characters	Set name. Enter an alphanumeric string of up to eight characters. The value ALL is disallowed.
DEVTYPE		SCSIDK	Device type. Enter SCSI DK.
PERMSCSI	SCSIBUS DEVNO	0 or 1, or 0 to 5	Permanent SCSI. This field consists of two entries: SCSIBUS and DEVNO. Enter either a 0 or a 1 to specify the SCSI bus number. Enter a number from 0 to 5 to specify the device number.
MEMSCSI	SCSIBUS DEVNO	0 or 1, or 0 to 5, and \$	Member SCSI. This field consists of two entries: SCSIBUS and DEVNO. Enter either a 0 or a 1 to specify the SCSI bus number. Enter a number from 0 to 5 to specify the device number. Once you have datafilled all the shadow set members terminate the MEMSCSI prompt with a \$.

### Datafill example for table SHADOW

The following examples show sample datafill for table SHADOW.

### MAP display example for table SHADOW

NODETYPE	NODENO	SETNAME	DEVTYPE	MEMBERS
FP	1	SS00	SCSIDK 0 3	\$
FP	5	SS00	SCSIDK 0 0	(0 2)\$

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## Application and file processors (continued)

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### Error messages for table SHADOW

The following error messages apply to table SHADOW.

#### Error messages for table SHADOW (Sheet 1 of 3)

Error message	Explanation and action
Given node is unequipped. Try datafilling it first.	The FP is not datafilled. Determine the correct node or complete the FP datafill and then try again.
Given node is OffL. Operation will be communicated to it later.	The node is offline. No action required.
Given node is NA and not OffL. Operation will be communicated to it later.	The node is not accessible (NA). No action required.
The setname is not unique on the given node. Try renaming.	The shadow set name is already in use. Use a unique shadow set name.
The specified, device type is not shadowed on the given node.	The device type is not shadowed. Use another device type.
Perm must remain unchanged. Try changing only the other members.	The permanent shadow set member cannot be changed. Use another member.
A member is duplicated. Try listing each member just once.	The shadow set member is enumerated twice. Use another member.
A member disk is unequipped. Try datafilling it first.	The device is not datafilled. Either use another device or complete the device datafill.
A member is datafilled as other than a disk. Only disks can be shadowed.	The device is not a disk. Determine the correct device number and then try again.
A member already belongs to a different, shadow set.	The member is part of another shadow set. Choose another member and try again.
A member is not OffL. Retry after offlining it.	The shadow set member is not offline. Offline the shadow set member before proceeding.
Messaging to or from the given node is faulty. Try later.	The FP or the FP software is not receiving messages. Wait for the message link to return to service and then try again. Check for SWERs.

## Application and file processors (continued)

### Error messages for table SHADOW (Sheet 2 of 3)

Error message	Explanation and action
Given node's mtce entity (INM) did not respond to a query on its status.	A software error has occurred. Check the SWERs to determine the fault and then try again.
Software has encountered an error. Check for SWERs.	A software error has occurred. Check the SWERs to determine the fault.
Software was unable to allocate data store. Try later.	Data store memory could not be allocated. Try later.
Devices or shadow sets are undergoing maintenance on given node. Try later.	The devices or shadow sets are in a maintenance state. Wait for the devices or shadow maintenance action to finish and then try again..
Given node type is not supported.	Only the node type FP is supported. Enter node type FP.
The given key is invalid.	The key is not supported. Use another key.
The given index is invalid. The physical store might be corrupted.	The index is invalid. Contact your next level of support.
A semaphore operation has failed. Check for SWERs and TRAPs, and try later.	The semaphore failed. Check the SWERs or TRAPs to determine the fault and then then try again.
Software was unable to deallocate data store. Try later.	The data store memory could not be deallocated. Try later.
Data store was free when expected to be in use. Try later.	The data store memory state was unexpected. Try later.
Device type must remain unchanged. Try changing only the members.	The device type cannot be changed. Change the shadow set member.
Software error: internal, device name was invalid. Check logs.	A software error has occurred. Determine the correct device number and then contact your next level of support.
Software error: message version is incompatible.	A software error has occurred. Contact your next level of support.



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## Application and file processors (end)

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### Error messages for table SHADOW (Sheet 3 of 3)

Error message	Explanation and action
Given node number is invalid. Correct it and retry.	The file processor (FP) node number is incorrect. Determine the correct node number and then try again.
Mailbox could not be allocated. Try later.	No mailbox was available. Try later.
Could not get mail-transport address (MTA). Try later.	No mail transport address was available. Try later.
Master might get deleted, thus corrupting the shadow set and databases on it!	The master shadow set member may be deleted. Do not proceed further. If you have to delete the master, contact your next level of support.
Software error: conversion between node number and DDM index failed.	A software error has occurred. Contact your next level of support.
The node that was supposed to house the shadow set is unaware of it.	The FP is does not recognize the shadow set. Contact your next level of support.
Could not access data store due to an ongoing dump. Try later.	The data store memory contents are being dumped. Wait for the dump to finish and then try again.
The master has not yet been determined by consulting member disks. Beware!	There may be no master shadow set member. Do not make a datafill change before returning the set to service, this could affect shadow set recovery. Contact your next level of support.
The setname is reserved. Try renaming.	Use a unique shadow set name. The value ALL is not allowed.

### Translation verification tools

Application and file processors does not use translation verification tools.

### SERVORD

Application and file processors does not use SERVORD.



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## 5 Datafilling SAID Essentials

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The following chapter describes the SAID Essentials, SAID00001, functionality.

## Datafilling BAS SAID

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### Ordering codes

Functional group ordering code: SAID0001

Functionality ordering code: Not applicable

### Release applicability

BCS36 and up

### Prerequisites

Datafilling BAS SAID has no prerequisites.

### Description

This feature modifies the Network Facility Access (NFA) AMA generation procedures to incorporate the new definition for the Access Type field and alters the use of the CONV\_REQ field of the 047 AMA module record. This module is appended to AMA records which are generated to record an NFA trunk connection as well as AMA records which are generated to record calls which are extended by an NFA trunk connection. This feature also eliminates all scenarios where two 047 module records are appended to a single AMA record.

#### Changes to the Access Method Field of the 047 Module

This feature incorporates the new definition of the access method field of the 047 AMA module into the NFA AMA generation procedures. The access method field has a range of four possible values: 0, 1, 2, and 3. Previously, the value recorded in this field indicated the type of IP connection which led to the creation of the corresponding AMA record. The value 0 was not used, a value of 1 indicated an implicit connection, a value of 2 indicated an explicit connection, and a value of 3 indicated a remote connection. With this feature, the access method field will indicate what type of NFA connection took place previous to the event which is recorded in the corresponding AMA record. A value of 0 will indicate that no IP connection occurred before the event which is recorded in the AMA record. A value of 1 will indicate that an implicit NFA connection took place prior to the event which is recorded in the AMA record. A value of 2 will indicate that an explicit NFA connection took place prior to the event which is recorded in the AMA record. A value of 3 will indicate that a remote NFA connection took place prior to the event which is recorded in the AMA record.

This feature also eliminates all scenarios in which two 047 modules are appended to any given AMA record. This is made possible with the new definition associated with the access method field. The call scenarios which previously caused two 047 records to be generated are outlined in the AM

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**Datafilling BAS SAID** (continued)

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section of feature document NC0418 as well as the NFA section of the AIN translations guide.

**CONV\_REQ Modifications for Extended Conversion**

This feature alters the use of the CONV\_REQ field in the 047 AMA module. Previously, this field was set to 2 (true) if DP to DTMF conversion is performed while the subscriber is connected to the NFA trunk, and set to 1 (false) if DP to DTMF conversion is not performed while the subscriber is connected to the NFA trunk. With this feature, the CONV\_REQ field will be set to 2 (true) if DP to DTMF conversion is performed at any time for the subscriber. This includes the time that the subscriber is connected to the NFA trunk as well as any call extended for the subscriber by an explicit access with extended DP to DTMF conversion.

**Operation**

The originating DN field of AMA records with call codes 174 and 175 are always populated with the DN of the NFA subscriber.

The content of the terminating DN field of AMA records with call code 174 will depend on whether the record was generated to record an explicit connection or a remote connection. If the 174 record was generated to record an explicit connection, the terminating DN field will be populated with the feature access code which was dialed to initiate the explicit connection. If the 174 record was generated to record a remote connection, the terminating DN field will be populated with all zeros.

The service code field of the 047 module is always populated with the service code which was sent to the IP during the access which initiated the event which is recorded by the corresponding AMA record. This could be the implicit, explicit, or remote access service code, depending on the type of access which is being recorded.

The '\*' and '#' digits will not be included in the terminating DN field of the 174 AMA record or in the service code field of the 047 module.

The access method field will indicate what type of NFA connection took place previous to the event which is recorded in the corresponding AMA record, as outlined in the previous section. In the case of remote access, the access method field will always contain a 0 for 047 modules which are appended to AMA records with call code 174. This is the case since the digit string that routes a call to the remote access authorization platform will be considered to be terminated on the platform. If the authorization is successful and results in a remote access connection to the IP, the remote access is considered to have not been dialed by the IP, but instead dialed by the remote access authorization

**Datafilling BAS SAID (continued)**

platform. Since this is the case, the access method field in the 047 module will be set to 0 to indicate that the remote access was not dialed by another IP access.

The conversion required field of the 047 module will always indicate whether or not Dial Pulse to DTMF conversion is performed for the subscriber while the subscriber is connected to the NFA trunk. This pertains to the IP access which initiated the event which is recorded by the corresponding AMA record.

**047 module contents for call scenarios generating 174 AMA records**

The following table lists NFA call scenarios in which a 174 AMA record is generated. The table contains, for each scenario, the service code found in the 047 module that is appended to the 174 AMA record. Only one 047 module will be appended to any 174 AMA record. All possible datafill combinations for AMA\_IPDIAL, AMA\_EXP, and AMA\_REM are shown.

It is possible that a 175 AMA record will be generated in some of these scenarios instead of or in addition to the 174 AMA record. The tables under the next heading, "047 Module contents for call scenarios generating 175 AMA records", specify the contents of the service code field in those records.

Use the following information to interpret the terms of the table:

- implicit - connection resulting from off-hook or flash
- explicit1 - connection established by dialing an NFA explicit feature access code
- explicit1 (Explicit2) FAC - NFA explicit feature access code. Explicit1 FAC and Explicit2 FAC may be the same or two different feature access codes
- SC - service code
- N/A - Not applicable. A 174 AMA record is not generated in this scenario

**047 Module service code field contents for 174 AMA record (Sheet 1 of 2)**

AMA IPDIAL	AMA EXP	AMA REM	Implicit dials explicit1 FAC	User dials explicit1 FAC	Explicit1 dials explicit2 FAC	Remote access established after validation
Y	Y	Y	SC for explicit1	SC for explicit1	SC for explicit2	SC for remote
Y	Y	N	SC for explicit1	SC for explicit1	SC for explicit2	N/A

**Datafilling BAS SAID** (continued)

**047 Module service code field contents for 174 AMA record (Sheet 2 of 2)**

<b>AMA IPDIAL</b>	<b>AMA EXP</b>	<b>AMA REM</b>	<b>Implicit dials explicit1 FAC</b>	<b>User dials explicit1 FAC</b>	<b>Explicit1 dials explicit2 FAC</b>	<b>Remote access established after validation</b>
Y	N	Y	N/A	N/A	N/A	SC for remote
Y	N	N	N/A	N/A	N/A	N/A
N	Y	Y	SC for explicit1	SC for explicit1	SC for explicit2	SC for remote
N	Y	N	SC for explicit1	SC for explicit1	SC for explicit2	N/A
N	N	Y	N/A	N/A	N/A	SC for remote
N	N	N	N/A	N/A	N/A	N/A

The following table lists NFA call scenarios in which a 174 AMA record is generated. The table contains, for each scenario, the CONV\_REQ field found in the 047 module that is appended to the 174 AMA record. Only one 047 module will be appended to any 174 AMA record. All possible datafill combinations for AMA\_IPDIAL, AMA\_EXP, and AMA\_REM are shown.

In each case that is not shown as either N/P or N/A, the CONV\_REQ field in the 047 module is set to 2 if DP-to-DTMF conversion is performed during the specified NFA connection. Otherwise, the CONV\_REQ field is set to 1.

It is possible that a 175 AMA record will be generated in some of these scenarios instead of or in addition to the 174 AMA record. The tables under the next heading, "047 module contents for call scenarios generating 175 AMA records", specify the contents of the CONV\_REQ field in those records.

Use the following information to interpret the terms of the table:

- Implicit - connection resulting from off-hook or flash
- Explicit1 - onnection established by dialing an NFA explicit feature access code
- Explicit1 (Explicit2) FAC - NFA explicit feature access code. Explicit1 FAC and Explicit2 FAC may be the same or two different feature access codes.
- Conv - DP-to-DTMF conversion performed

**Datafilling BAS SAID** (continued)

- N/A - not applicable. A 174 AMA record is not generated in this scenario.
- N/P - not performed. DP-to-DTMF conversion cannot be performed in this scenario.

**047 module CONV\_REQ field contents for 174 AMA record**

AMA IPDIAL	AMA EXP	AMA REM	Implicit dials explicit1 FAC	User dials explicit1 FAC	Explicit1 dials explicit2 FAC	Remote access established after validation
Y	Y	Y	Conv at explicit1	Conv at explicit1	Conv at explicit2	N/P
Y	Y	N	Conv at explicit1	Conv at explicit1	Conv at explicit2	N/A
Y	N	Y	N/A	N/A	N/A	N/P
Y	N	N	N/A	N/A	N/A	N/A
N	Y	Y	Conv at explicit1	Conv at explicit1	Conv at explicit2	N/P
N	Y	N	Conv at explicit1	Conv at explicit1	Conv at explicit2	N/A
N	N	Y	N/A	N/A	N/A	N/P
N	N	N	N/A	N/A	N/A	N/A

**047 module contents for call scenarios generating 175 AMA records**

The following table lists NFA call scenarios in which a 175 AMA record is generated. The table contains, for each scenario, the service code found in the 047 module that is appended to the 175 AMA record. Only one 047 module will be appended to any 175 AMA record. All possible datafill combinations for AMA\_IPDIAL, AMA\_EXP, and AMA\_REM are shown.

It is possible that a 174 AMA record will be generated in some of these scenarios instead of or in addition to the 175 AMA record. The tables under the prior heading, "047 module contents for call scenarios generating 174 AMA records", specify the contents of the service code field in those records.

Use the following information to interpret the terms of the table:

- Implicit - connection resulting from off-hook or flash
- Explicit1 FAC - NFA explicit feature access code



## Datafilling BAS SAID (continued)

- NFRA DN/FAC - NFA remote access DISA DN or feature access code
- SC - service code
- N/A - not applicable. A 175 AMA record is not generated in this scenario.

**047 module service code field contents for 175 AMA record, part 1**

AMA IPDIAL	AMA EXP	AMA REM	Implicit dials DN	Implicit dials explicit1 FAC	Implicit dials NFRA DN/FAC
Y	Y	Y	SC for implicit	N/A	SC for implicit
Y	Y	N	SC for implicit	N/A	SC for implicit
Y	N	Y	SC for implicit	SC for explicit1	SC for implicit
Y	N	N	SC for implicit	SC for explicit1	SC for implicit
N	Y	Y	N/A	N/A	N/A
N	Y	N	N/A	N/A	N/A
N	N	Y	N/A	N/A	N/A
N	N	N	N/A	N/A	N/A

The following table lists NFA call scenarios in which a 175 AMA record is generated. The table contains, for each scenario, the service code found in the 047 module that is appended to the 175 AMA record. Only one 047 module will be appended to any 175 AMA record. All possible datafill combinations for AMA\_IPDIAL, AMA\_EXP, and AMA\_REM are shown.

It is possible that a 174 AMA record will be generated in some of these scenarios instead of or in addition to the 175 AMA record. The tables under the prior heading, "047 module contents for call scenarios generating 174 AMA records", specify the contents of the service code field in those records.

Use the following information to interpret the terms of the table:

- Explicit1 - connection established by dialing an NFA explicit feature access code
- Explicit1 (Explicit2) FAC - NFA explicit feature access code. Explicit1 FAC and Explicit2 FAC may be the same or two different feature access codes.
- NFRA DN/FAC - NFA remote access DISA DN or feature access code.

**Datafilling BAS SAID** (continued)

- SC - service code
- N/A - not applicable. A 175 AMA record is not generated in this scenario.

**047 module service code field contents for 175 AMA record, part 2**

AMA IPDIAL	AMA EXP	AMA REM	Explicit1 dials DN	Explicit1 dials explicit2 FAC	Explicit1 dials NFRA DN/FAC	Remote access dials DN
Y	Y	Y	SC for explicit1	N/A	SC for explicit1	SC for remote
Y	Y	N	SC for explicit1	N/A	SC for explicit1	SC for remote
Y	N	Y	SC for explicit1	SC for explicit2	SC for explicit1	SC for remote
Y	N	N	SC for explicit1	SC for explicit2	SC for explicit1	SC for remote
N	Y	Y	N/A	N/A	N/A	N/A
N	Y	N	N/A	N/A	N/A	N/A
N	N	Y	N/A	N/A	N/A	N/A
N	N	N	N/A	N/A	N/A	N/A

The following table lists NFA call scenarios in which a 175 AMA record is generated. The table contains, for each scenario, the CONV\_REQ field in the 047 module that is appended to the 175 AMA record. Only one 047 module will be appended to any 175 AMA record. All possible datafill combinations for AMA\_IPDIAL, AMA\_EXP, and AMA\_REM are shown.

In each case that is not shown as either N/P or N/A, the CONV\_REQ field in the 047 module is set to 2 if DP-to-DTMF conversion is performed during the specified NFA connection. Otherwise, the CONV\_REQ field is set to 1.

It is possible that a 174 AMA record will be generated in some of these scenarios instead of or in addition to the 175 AMA record. The tables under the prior heading, "047 module contents for call scenarios generating 174 AMA records", specify the contents of the CONV\_REQ field in those records.

**Datafilling BAS SAID** (continued)

Use the following information to interpret the terms of the table:

- Implicit - connection resulting from off-hook or flash
- Explicit1 - connection established by dialing an NFA explicit feature access code
- Explicit1 FAC - NFA explicit feature access code
- NFRA DN/FAC - NFA remote access DISA DN or feature access code
- Conv - DP-to-DTMF conversion performed
- N/A - not applicable. A 175 AMA record is not generated in this scenario.
- N/P - not performed. DP-to-DTMF conversion cannot be performed in this scenario.

**047 module CONV\_REQ field contents for 175 AMA record, part 1**

AMA IPDIAL	AMA EXP	AMA REM	Implicit dials DN	Implicit dials explicit1 FAC	Implicit dials NFRA DN/FAC
Y	Y	Y	N/P	N/A	N/P
Y	Y	N	N/P	N/A	N/P
Y	N	Y	N/P	Conv at explicit1	N/P
Y	N	N	N/P	Conv at explicit1	N/P
N	Y	Y	N/A	N/A	N/A
N	Y	N	N/A	N/A	N/A
N	N	Y	N/A	N/A	N/A
N	N	N	N/A	N/A	N/A

The following table lists NFA call scenarios in which a 175 AMA record is generated. The table contains, for each scenario, the CONV\_REQ field in the 047 module that is appended to the 175 AMA record. Only one 047 module will be appended to any 175 AMA record. All possible datafill combinations for AMA\_IPDIAL, AMA\_EXP, and AMA\_REM are shown.

In each case that is not shown as either N/P or N/A, the CONV\_REQ field in the 047 module is set to 2 if DP-to-DTMF conversion is performed during the specified NFA connection. Otherwise, the CONV\_REQ field is set to 1.

It is possible that a 174 AMA record will be generated in some of these scenarios instead of or in addition to the 175 AMA record. The tables under

**Datafilling BAS SAID** (continued)

the prior heading, "047 Module contents for call scenarios generating 174 AMA records", specify the contents of the CONV\_REQ field in those records.

Use the following information to interpret the terms of the table:

- Explicit1 - connection established by dialing an NFA explicit feature access code
- Explicit1 (Explicit2) FAC - NFA explicit feature access code. Explicit1 FAC and Explicit2 FAC may be the same or two different feature access codes.
- NFRA DN/FAC - NFA remote access DISA DN or feature access code
- Conv - DP-to-DTMF conversion performed
- N/A - not applicable. A 175 AMA record is not generated in this scenario.
- N/P - not performed. DP-to-DTMF conversion cannot be performed in this scenario.

**047 module CONV\_REQ field contents for 175 AMA record, part 2**

AMA IPDIAL	AMA EXP	AMA REM	Explicit1 dials DN	Explicit1 dials explicit2 FAC	Explicit1 dials NFRA DN/FAC	Remote access dials DN
Y	Y	Y	Conv at explicit1	N/A	Conv at explicit1	N/P
Y	Y	N	Conv at explicit1	N/A	Conv at explicit1	N/P
Y	N	Y	Conv at explicit1	Conv at explicit2	Conv at explicit1	N/P
Y	N	N	Conv at explicit1	Conv at explicit2	Conv at explicit1	N/P
N	Y	Y	N/A	N/A	N/A	N/A
N	Y	N	N/A	N/A	N/A	N/A
N	N	Y	N/A	N/A	N/A	N/A
N	N	N	N/A	N/A	N/A	N/A

**Translations table flow**

The Datafilling BAS SAID does not affect translations table flow.

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## Datafilling BAS SAID (continued)

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### Limitations and restrictions

Datafilling BAS SAID has no limitations or restrictions.

### Interactions

Datafilling BAS SAID has no functionality interactions.

### Activation/deactivation by the end user

Datafilling BAS SAID requires no activation or deactivation by the end user.

### Billing

The definition of two fields has changed in module code 047. These fields are Access Method and CONV REQ. Refer to the following figure for an example of an AMA record.

#### AMA record example

```
MODULE CODE:047C  SERV CODE:12345C  ACCESS:2C  
SUBSCR ID:00000007246C  CONV REQ:2C
```

The definition of the Access Method field has changed to indicate the type of NFA connection that took place previous to the event that is recorded in the corresponding AMA record. The range of values allowed for this field has not changed. This field still consists of two characters. The first character must still be taken from the set 0, 1, 2, or 3. The following definitions apply to these values:

- 0 = no previous IP connection
- 1 = implicit access
- 2 = explicit access
- 3 = remote access

The second character is still hex-C.

For the CONV REQ field, the definition has also changed. This field is now set to 2 (true) if DP to DTMF conversion is performed for the subscriber at any point in the call.

Previously, this field was set to 2 (true) if DP to DTMF conversion is performed while the subscriber is connected to the NFA trunk, and set to 1 (false) if DP to DTMF conversion is not performed while the subscriber is connected to the NFA trunk. With this feature, the CONV\_REQ field will be set to 2 (true) if DP to DTMF conversion is performed at any time for the

## Datafilling BAS SAID (continued)

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subscriber. This includes the time that the subscriber is connected to the NFA trunk as well as any call extended for the subscriber by an explicit access with extended DP to DTMF conversion.

### Station Message Detail Recording

Datafilling BAS SAID does not affect Station Message Detail Recording.

### Datafilling office parameters

The following table shows the office parameters used by Datafilling BAS SAID. For more information about office parameters, refer to the *Office Parameters Reference Manual*.

#### Office parameters used by Datafilling BAS SAID

Table name	Parameter name	Explanation and action
OFCENG	CRS_SUBRU_POOL2_SIZE	This feature eliminates all scenarios where more than one 047 module code is appended to an AMA record. The provisioning rules for this parameter have been modified. Refer to "Parameter calculation" in this feature description for the provisioning rules.

#### Parameter calculation

Module code 047 uses the SUBRU\_POOL2\_BLOCK structure, which is 16 words in size. This structure is provisioned by the CRS\_SUBRU\_POOL2\_SIZE office parameter in OFCENG.

There are two scenarios in which this module code is appended to an AMA record: explicit and NFA dials a call for the subscriber. They are described below.

#### Explicit

The subscriber directly dials an NFA explicit access. In this case, an AMA record with call code 175 is generated, and a 047 module code is appended. The SUBRU\_POOL2\_BLOCK is first obtained when the NFA trunk is terminated upon, and is held until the trunk is released. The maximum provisioning impact to the SUBRU\_POOL2\_BLOCK due to this scenario is as follows:

The lesser of the two following values:

- number of lines with NFA and AMA\_EXPLCT set to `Y`
- number of NFA trunks

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**Datafilling BAS SAID (end)**


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**NFA dials a call for the subscriber**

In this scenario, an 047 module is appended to the AMA records that are generated in that case. The 047 module is obtained after the NFA trunk has outpulsed digits to the DMS (just prior to the trunk being released and the call being extended) and is held until the extended call is dropped. There are three categories of AMA records that the 047 might be appended to in the NFA-dial case. They are described below.

**Existing AMA records that would normally be generated for the extended call** This type uses one 047 module. The maximum provisioning impact for this scenario is number of lines with NFA.

**A 175 record (as described above)** This also uses one 047 module, but only occurs if the line involved has the AMA\_IPDIAL field set to `Y'. The maximum provisioning impact for this scenario is number of lines with NFA and AMA\_IPDIAL set to `Y'.

**A 174 record** This would occur if the initial access to the NFA trunk (initiated by the subscriber) then extends the call for the user to another access to an NFA trunk (and that line has AMA\_EXPLCT set to `Y'; otherwise this is the second category). In this case, one 047 module is appended to the 174 record. The maximum provisioning impact for this scenario is lesser of: number of lines with NFA and AMA\_EXPLCT set to `Y', or number of NFA trunks.

The maximum provisioning impact to the CRS\_SUBRU\_POOL2\_BLOCK parameter occurs in a scenario in which all the NFA lines with AMA\_EXPLCT set to `Y' are described above, and all the remaining NFA lines are described in the first situation above. The formula for this would therefore be (the formula for 'C') + (total number of NFA lines - lesser of: number of lines with NFA and AMA\_EXPLCT set to 'Y', or number of NFA trunks).

**Datafill sequence**

Datafilling BAS SAID does not affect datafill.

**Translation verification tools**

Datafilling BAS SAID does not use translation verification tools.

**SERVORD**

Datafilling BAS SAID does not use SERVORD.

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## Network Facility Access

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### Ordering codes

Functional group ordering code: SAID0001

Functionality ordering code: Not applicable

### Release applicability

BCS34 and up

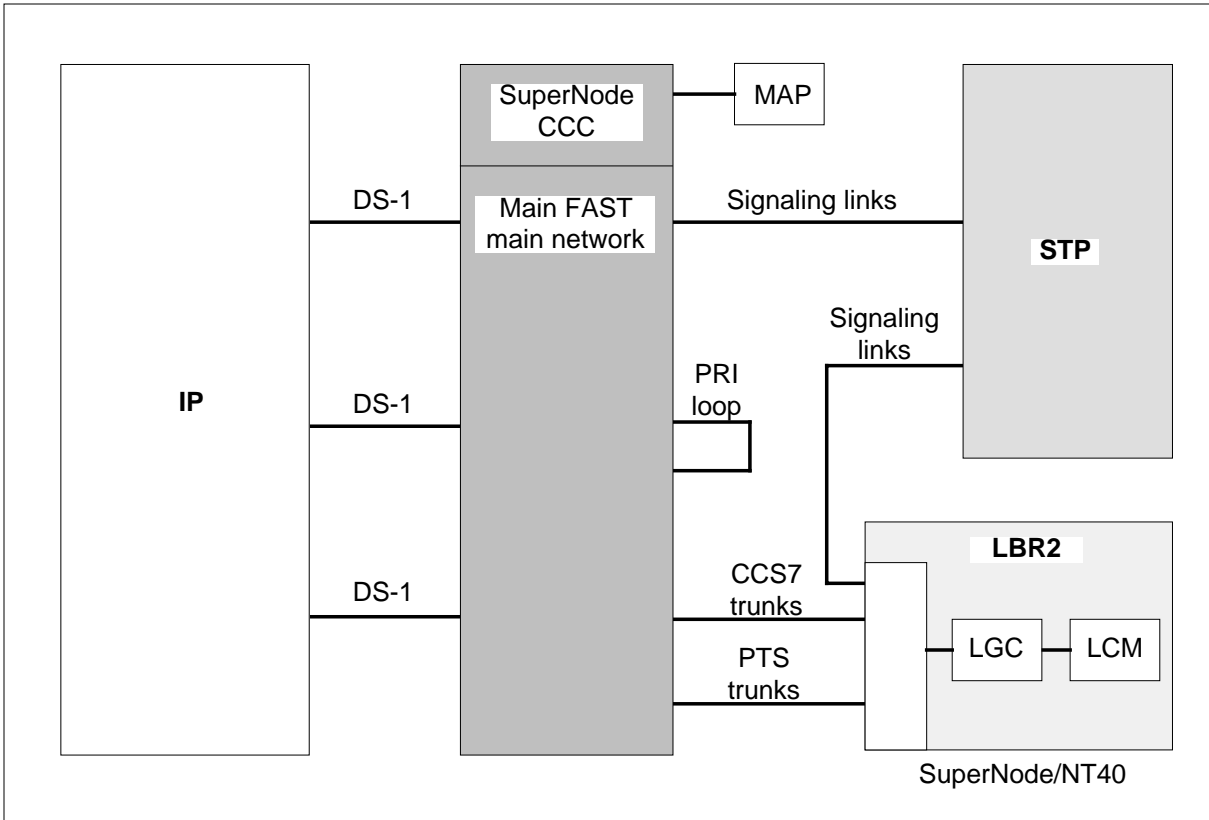
### Prerequisites

Network Facility Access has no prerequisites.

### Description

This feature provides network facility access (NFA) or a direct connection between a subscriber line and an intelligent processor (IP), enabling the subscriber to access services provided directly by the IP. The access to the IP is provided by a DMS-100 or DMS-100/200 switch. The actual functionality and programming of the IP is not discussed in this chapter.

### Network Facility Access configuration





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## Network Facility Access (continued)

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The subscriber is provided access to the IP in two ways: implicit (or auto) and explicit (or dialed).

- With implicit access, the NFA user, when going off-hook, is simultaneously connected to a DMS digit receiver card and an NFA trunk going to the IP. The subscriber can speak with the IP, which initiates voice-activated dialing, or can revert to regular call processing by dialing as normal.
- With explicit access, the subscriber goes off-hook and dials an NFA explicit access code. The DMS switch processes the access code and establishes an NFA trunk connection to the IP. The subscriber can then either speak with the IP or can enter digits for the IP to interpret. If these digits are dial pulse (DP), they are converted to dual-tone multifrequency (DTMF) digits by the DMS switch before they are relayed to the IP.

Both implicit and explicit access provide the ability for the IP to dial for the subscriber. Any call initiated by the IP dialing is handled as though the subscriber had dialed the digits, including billing. The IP can dial a number capable of being routed, as well as a feature access code, from an implicit or explicit connection.

The IP is connected to the DMS switch over a DS-1 digital trunk. This trunk only supports terminations; call originations from the IP over this trunk are not supported. Standard inband signaling is used over the trunk connection.

### Operation

This feature has two main modes of operation, implicit and explicit. In implicit mode, the IP is directly connected to the subscribers line in parallel with a digit receiver upon every origination. This digit receiver can be a DTMF receiver or a UTR. A receiver is used only if the line uses DTMF signaling. DP lines do not require a digit receiver.

In the explicit mode, the subscriber must first dial an access code and is then directly connected to the IP. Any DP digits entered by the subscriber while connected in explicit mode are converted to DTMF digits before being outputted to the IP.

With either implicit or explicit access, the DMS switch provides the capability for the IP to dial a call for the subscriber. If this capability is called for, the subscriber is first placed on hold while the IP dials. After all the digits are received on the NFA trunk from the IP, the trunk connection to the IP is dropped. The subscriber is made active again and the call routes as though the subscriber had dialed the digits.

## **Network Facility Access** (continued)

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### **Implicit mode**

With implicit access, the NFA user, upon going off-hook, is simultaneously connected to a DMS receiver card and the IP. The subscriber can interact with the IP or can revert to regular call processing by dialing as normal.

### **Implicit operation**

An implicit connection to the IP is initiated every time the subscriber goes off-hook, provided that the NFA option has been added to the subscribers line. The implicit status of a subscriber must be active and is controlled by the subscriber using a feature access code. The feature access code is datafilled in table IBNXLA.

Upon going off-hook, the DMS switch first provides normal dial tone or stuttered dial tone to the subscriber. The subscriber only receives stuttered dial tone if the line has a feature which provides stuttered dial tone and if that feature is active. A receiver off-hook (ROH) timer also is activated. The DMS switch then finds a trunk group over which it can make a connection to the IP. This determination is made from routing information datafilled in the lines customer group data, table CUSTSTN.

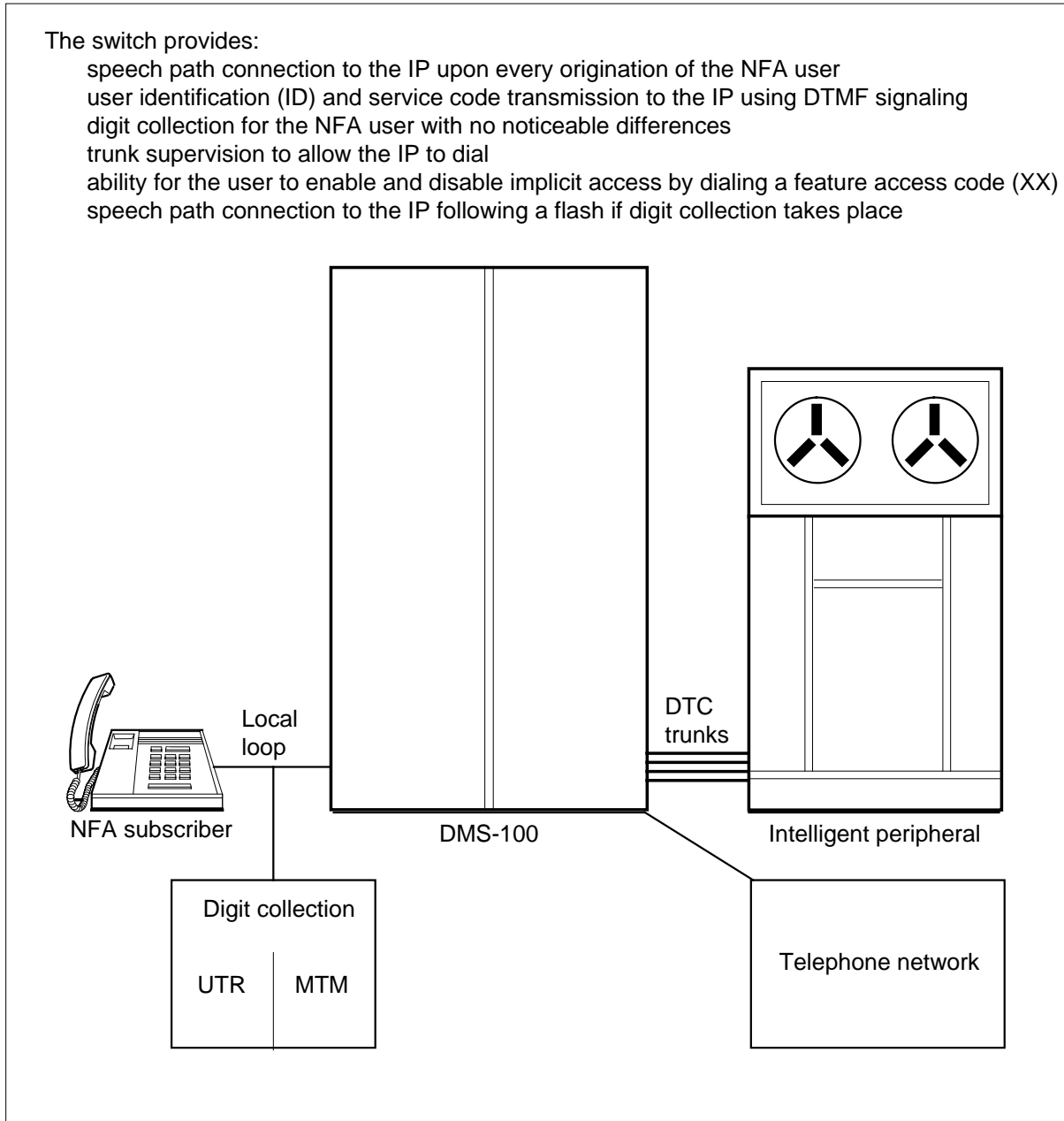
In attempting to establish the implicit connection to the IP, if there are no idle members of the trunk group, an existing trunk operational measurement (OM), TRK\_NOVFLATB, is pegged and the connection attempt is aborted. The subscriber does not receive an implicit access in this situation but does retain dial tone and can call process as normal.

**Network Facility Access (continued)**

**NFA implicit access**

The switch provides:

- speech path connection to the IP upon every origination of the NFA user
- user identification (ID) and service code transmission to the IP using DTMF signaling
- digit collection for the NFA user with no noticeable differences
- trunk supervision to allow the IP to dial
- ability for the user to enable and disable implicit access by dialing a feature access code (XX)
- speech path connection to the IP following a flash if digit collection takes place



If there is an idle member of the trunk group, it is seized and the implicit service code and user ID for the line are outpulsed to the IP. These values are datafilled in the subscribers line data in table IBNFEAT.

## Network Facility Access (continued)

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At this point, the DMS switch waits for one of the following events to occur:

- Answer supervision is received from the NFA trunk. The DMS switch removes dial tone from the line and sets up a two-way voice path between the subscriber and the IP. The subscriber now hears whatever the IP provides over the voice path. Answer supervision can be sent by the NFA trunk before the DMS switch finishes outputting digits. However, the DMS switch does not recognize and process the answer supervision until all of the service code and user ID digits have been outputted. If the answer is not received from the trunk within a time datafilled in the trunks group data, the trunk is released and the subscriber retains normal call processing ability, since the dial tone would have never been broken.
- The subscriber goes on-hook. The DMS switch drops the trunk connection. This drop can occur before or after answer is received from the NFA trunk.
- The IP goes on-hook, after sending answer supervision to the DMS switch and before dialing a number for the subscriber. The trunk connection is dropped and the DMS switch applies new dial tone to the subscriber, who can now call process as usual. This tone is a normal steady dial tone. The ROH timer is also reset at this time.
- The subscriber dials a digit. The NFA trunk is released. If the subscriber dials a digit before the trunk connection has been completed, the connection attempt is aborted. Call processing now occurs for the subscriber. The first digit dialed by the subscriber is reported to the DMS switch so that disconnection of the IP can proceed as quickly as possible. This disconnection prevents the subscriber from hearing anything from the IP while dialing is taking place.

*Note:* The subscriber retains the ability to dial digits throughout the duration of an implicit connection except while the IP is dialing a number for the subscriber.

- After answering, the IP indicates to the DMS switch that it wishes to dial number for the subscriber. Refer to "IP dialing" in this feature description for more information.
- The ROH timer expires without any of the above events occurring. The subscriber receives reorder treatment and the IP connection is dropped.

### **Stuttered dial tone**

When an implicit connection to the IP is being established, if the subscriber line currently has a stuttered dial tone set (due to message waiting being active, for example), then the stuttered dial tone service code is outputted to the IP instead of the normal implicit service code.

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## Network Facility Access (continued)

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### SAID implicit disconnect-reconnect timer

The Speech-Activated Intelligent Dialing (SAID) implicit disconnect-reconnect timer is used to disallow SAID Implicit Access when a SAID Implicit Access subscriber receives disconnect (DISC) treatment as a result of the originator of the call going on-hook.

The blocking of SAID Implicit Access is necessary for SAID Implicit Access subscribers with answering machines that do not recognize DISC treatment. The disconnect-reconnect timer prevents the triggering of SAID Implicit Access until after the subscriber's answer machine disconnects from the call by going on-hook.

Office parameter NFA\_IMPL\_DISCON\_RECON\_TIMER in Table OFCENG is used to enable or disable the blocking of subscriber access to SAID Implicit Access.

If the value of the timer is set to 0, the SAID Implicit Access is triggered under the usual conditions.

If the value of the timer is greater than zero, SAID Implicit Access is blocked for the number of seconds specified in the timer providing both of the following conditions are met:

- SAID Implicit Access subscriber is the called party of the previous call
- SAID Implicit Access subscriber receives disconnect (DISC) treatment as a result of the calling party going on-hook first.

The timer starts right after DISC treatment has been applied to the SAID Implicit Access subscriber line. If the timer does not expire before the SAID Implicit Access subscriber originates another call, SAID Implicit Access is denied. SAID Implicit Access is only blocked for the next call originated by the SAID Implicit Access subscriber.

If the SAID Implicit Access subscriber goes on-hook before receiving DISC treatment, SAID Implicit Access is triggered upon the origination of the next call regardless of the value set for the timer in the office parameter, NFA\_IMPL\_DISCON\_RECON\_TIMER.

If the timer expires before the SAID Implicit Access subscriber originates another call, SAID Implicit Access is triggered.

### Explicit mode

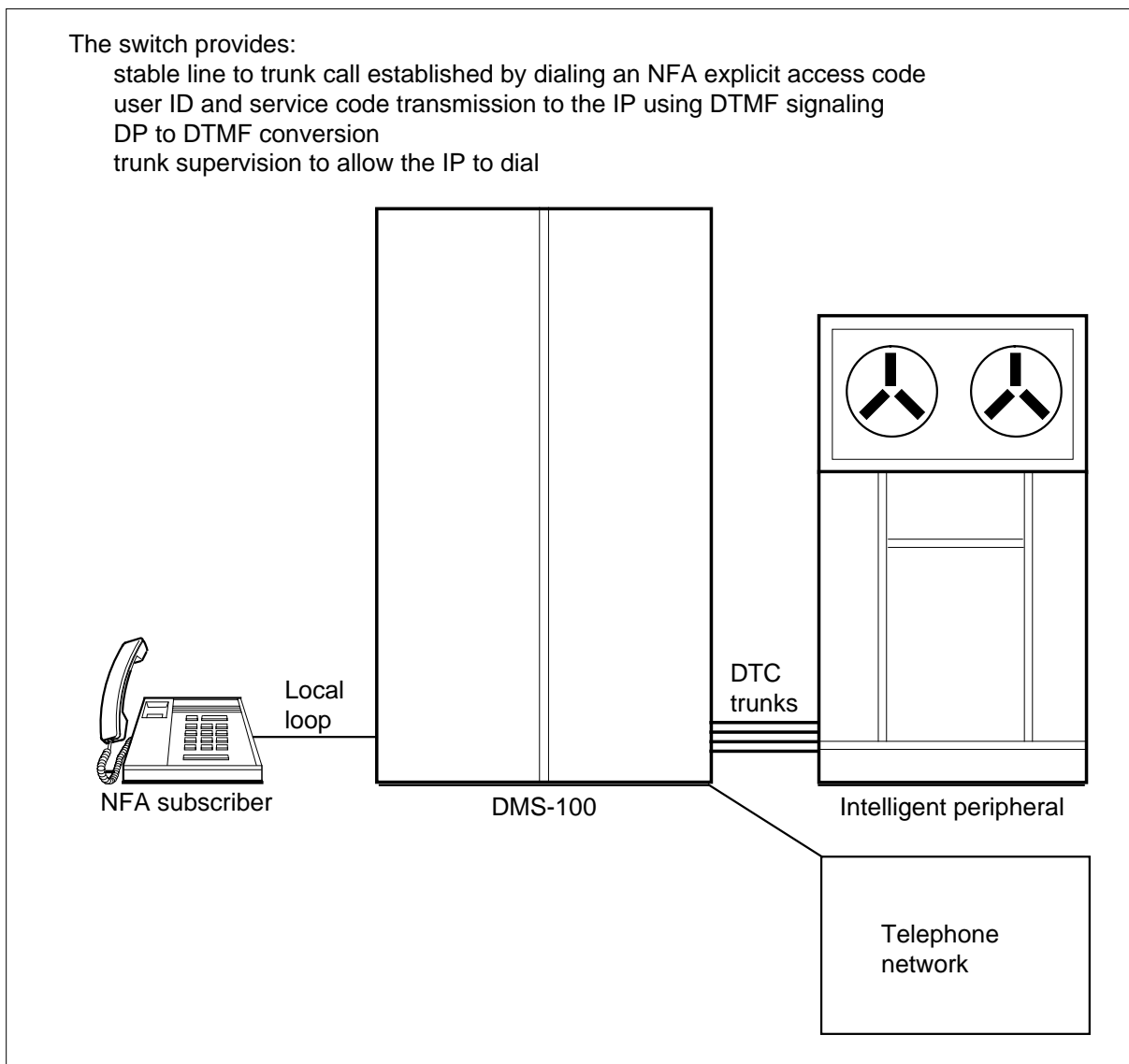
In the explicit mode, the subscriber must first dial an access code and then is directly connected to the IP. Any DP digits entered by the subscriber, while in

## Network Facility Access (continued)

the explicit mode, are converted to DTMF digits before being outputted to the IP.

### NFA explicit access

The switch provides:  
stable line to trunk call established by dialing an NFA explicit access code  
user ID and service code transmission to the IP using DTMF signaling  
DP to DTMF conversion  
trunk supervision to allow the IP to dial



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## Network Facility Access (continued)

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### Explicit operations

The following events take place during an explicit connection:

- The subscriber goes off-hook and enters the digits of an NFA explicit feature access code.

*Note:* If the subscriber has been assigned both implicit and explicit NFA access, the implicit NFA connection can be used to dial the explicit NFA feature access code, as described in the previous section.

- The DMS switch determines that the subscriber has dialed an explicit access code. If explicit access is allowed for the line, the DMS switch routes to the NFA trunk group associated with the dialed feature access code. If there are no idle trunk members, the TRK\_NOVFLATB OM is pegged, the connection attempt is aborted, and the subscriber receives no circuit treatment (NCRT). If an idle trunk member is seized, the explicit service code and user ID for the line are outpulsed over the trunk. The explicit service code is obtained from the translations datafill associated with the access code for the subscriber. If explicit access for the line is not allowed, the subscriber receives treatment.
- The IP sends answer supervision back to the DMS switch and a stable connection is completed. Answer supervision can be sent by the NFA trunk before the DMS switch finishes outpulsing digits. However, the DMS switch does not recognize and process the answer supervision until all of the service code and user ID digits have been outpulsed.

If the subscriber goes back on-hook at any of the above steps, then the process is aborted and the trunk is disconnected.

If the subscriber remains off-hook, the following things can occur:

- The subscriber dials digits. If these are DP digits, they are converted to DTMF before being outpulsed on the NFA trunk to the IP. Refer to "DP to DTMF digit conversion" in this feature description for more information. Unlike the implicit connection, the DMS switch is not performing any digit collection at this point.
- The subscriber flashes. The action taken depends upon the context in which the flash occurs. If the flash's intent is to put the IP connection on hold, then the IP connection is dropped. For example, if the subscriber has a call-waiting tone and is flashing to connect to the incoming call, the IP connection drops off. If the flash does not put the connection on hold, such as when the IP connection is the second leg of a three-way call and the subscriber is flashing to bring in the first party, the flash has no effect on the IP. Any situation that would result in the IP connection being placed on hold results in the trunk connection being disconnected. See sections

## Network Facility Access (continued)

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entitled "Feature limitations and restrictions" in this feature description and "Feature interactions" in this feature description for more information.

*Note:* NFA Flash Processing is provided in feature NC0497, in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to feature NC0497 later in this chapter for additional information.

- The IP indicates that it intends to dial a number for the subscriber. See section entitled "IP dialing" in this feature description for additional information.

If none of the above events occur, the connection remains active until either the subscriber or the IP goes on-hook. If the subscriber goes on-hook, the trunk connection is dropped.

If the IP goes on-hook, standard disconnect treatment occurs for the subscriber. This treatment is controlled in table TMTCNTL.

### DP to DTMF digit conversion

DP to DTMF digit conversion is provided to convert DP digits entered from a subscribers customer premises equipment (CPE) to DTMF digits before these digits are outpulsed to the IP. Conversion is provided upon every explicit connection, even for a DTMF line, since such a line could still have a dial pulse CPE in use.

Whether or not a conversion actually occurs is recorded for use in automatic message accounting (AMA). That is, whether the subscriber actually enters a DP digit and it is converted to DTMF. Refer to the section entitled "Billing" in this feature description for additional information.

### IP dialing

The IP can dial a number for the subscriber during an implicit or an explicit connection. IP dialing is initiated by the IP sending an inverted wink signal to the DMS switch. An inverted wink is defined with the same timing parameters as that of a normal wink, as defined in Bellcore specification TR-TSY-000064, *LATA Switching System Generic Requirements, Issue 2*. However, the state changes are inverted. A normal wink is a state change from on-hook to off-hook and back to on-hook, while an inverted wink is a state change from off-hook to on-hook and back to off-hook.

Once the inverted wink is received by the DMS switch, the subscriber is placed on hold, ending DP to DTMF conversion, and a UTR is attached to the trunk. If no UTR is available, the trunk connection is dropped and the subscriber



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## Network Facility Access (continued)

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receives no circuit treatment (NCRT). Otherwise, an inverted wink signal is outputted back to the IP. The IP then sends DTMF digits to the DMS switch.

The end-of-digits dialed is specified either by an inter-digital timeout, as specified in the trunk datafill, or by a # digit. Once an end of digits indication has been obtained, the trunk connection is dropped, the subscriber is removed from hold, and the call proceeds with the digits that were received, as if the subscriber had dialed those digits. If the subscriber goes on-hook while the IP is outputting digits to the DMS switch, the trunk is released and any digits received are discarded.

The IP can dial any routable number, such as a directory number (DN), or a feature access code. This also includes one of the NFA feature access codes. The maximum number of digits that the IP can dial is 24. However, the IP can dial only a single string of digits. The concept of a digit separator, in which the IP would be capable of dialing two separate strings of digits for the subscriber, is not supported for this feature.

Refer to "Limitations and restrictions" in this feature description for additional information.

### Combination of implicit/explicit access

If desired, the office can allow a subscriber line to have both implicit and explicit access. When the subscriber goes off-hook, there is an implicit connection to the IP. When the subscriber dials an explicit access code, the implicit connection is dropped after the first digit is entered and an explicit connection is established after the digits are translated. Depending on the customer group and translations datafill, these two connections can be over the same trunk group or over different trunk groups.

It is also possible for the implicit connection to dial an explicit feature access code for the subscriber. As soon as the feature access code digits have been received from the IP on the implicit access, the NFA trunk connection is dropped and the digits are translated. This action causes a second NFA trunk connection for the explicit access to be established.

### Class of service

The NFA line option is supported for lines with line class codes for Residential Enhanced Services (RES) and Meridian Digital Centrex (MDC), previously referred to as Integrated Business Network (IBN). If the first field of the RES\_SO\_SIMPLIFICATION office parameter, RES\_AS\_POTS, is set to Y, NFA can also be added to 1FR and 1MR lines.

Adding this option to those lines automatically changes the line to a RES line, but it appears to be a 1FR or 1MR line with NFA as a `RES OPTION.'

## Network Facility Access (continued)

If RES\_AS\_POTS is set to N, NFA cannot be added to a 1 FR or 1 MR line but can be added to a RES line. The following table illustrates the line class code (LCC) compatibility with NFA.

### LCC compatibility with NFA

RES_AS_POTS setting	LCC	Add NFA?	Result
Y	1FR or 1 MR	Y	RES line, but LCC appears as 1 FR or 1 MR. NFA shown as RES option.
	RES - LCC does not exist		
N	1FR or 1 MR	N	----
	RES	Y	NFA added, LCC unaffected
----	IBN	Y	NFA added, LCC unaffected

The addition of the NFA option to a RES or MDC line does not change the flash scanning for that line. If the line already has flash reporting, adding NFA to that line does not eliminate it.

Lines extending from line group controllers (LGC), remote cluster controllers (RCC), subscriber carrier module (SCM), and subscriber module urbans (SMU) are supported.

CPE supporting dial pulse and DTMF tone dialing are supported by this feature. Meridian business sets (MBS) and integrated services digital network (ISDN) sets are not supported.

### Additional functionality - inverted wink, flash handling and UTR override

Three additional functions of NFA, inverted wink, flash handling, and UTR override, were developed in BCS35 but can be patched back into the BCS34 loads. If this patch is in place, refer to the feature description NC0497 later in this chapter for information on these functions.

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## Network Facility Access (continued)

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### Translations table flow

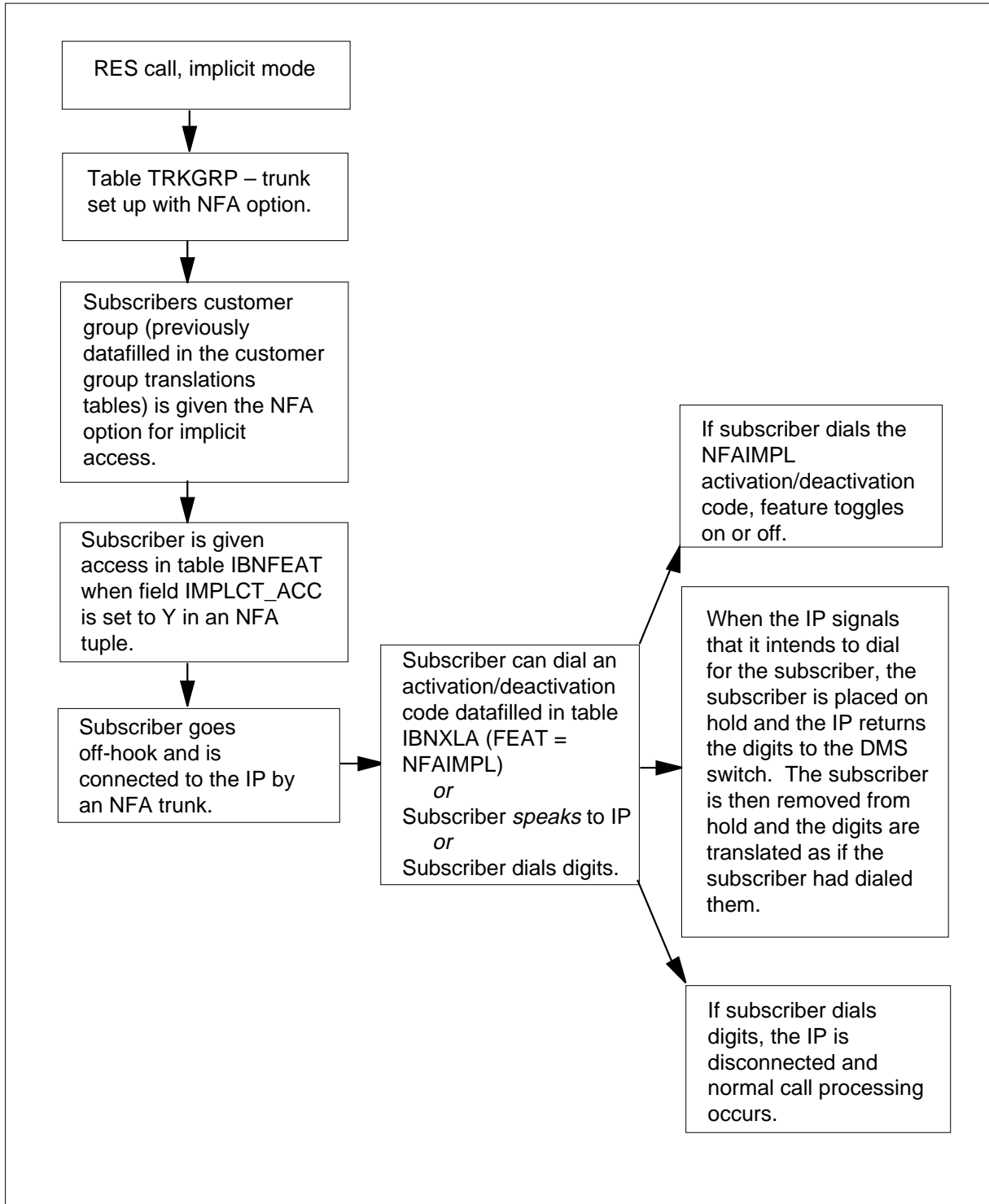
The Network Facility Access translations tables are described in the following list:

- Table TRKGRP contains some of the customer-defined data associated with each trunk group that exists in the switch. Table TRKGRP contains a new trunk group type defined by this feature, NFA. All NFA trunks must be defined with this group type.
- Table IBNXLA defines the digit translations for MDC and RES customer groups. This table provides implicit mode activation or deactivation for NFA by defining the access code for NFA implicit mode. Table IBNXLA can also be used to specify the feature access codes that are used to initiate explicit access to an NFA trunk.
- Table IBNFEAT defines features added to a subscriber line and contains an NFA feature tuple for every NFA subscriber. This tuple contains all subscriber-specific information associated with NFA.

The Network Facility Access translation process is shown in the flowchart that follows and shows the datafill content used for NFA, implicit access for an MDC line.

## Network Facility Access (continued)

Table flow for Network Facility Access—implicit access for an MDC line



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## Network Facility Access (continued)

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The following table lists the datafill content used in the flowchart example for NFA, implicit access. The example is for an MDC line.

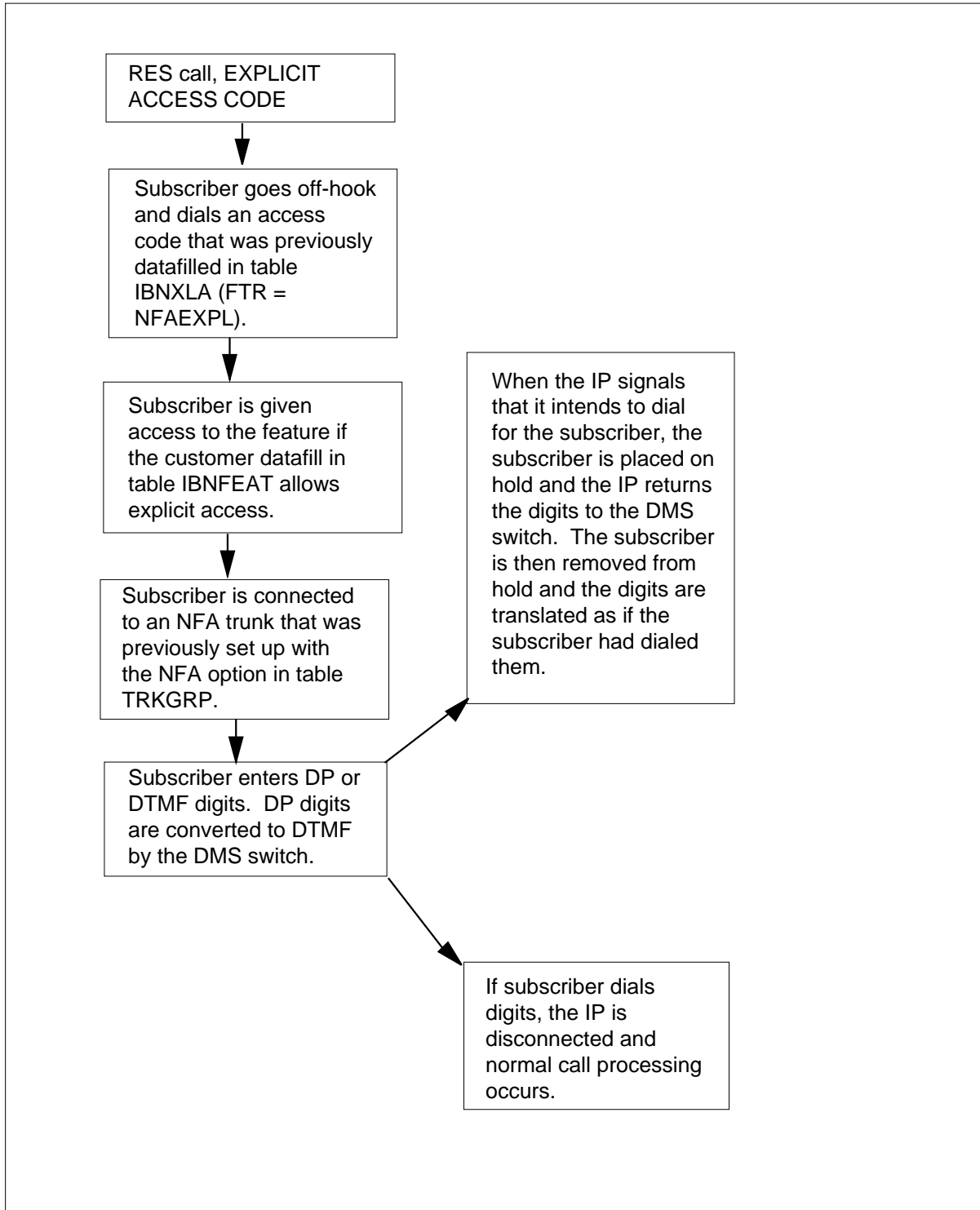
### Datafill example for Network Facility Access

Item	Example data
Called number	621-5878
Implicit activation access code	*93
Customer group name	AINIBN
Datafill table	Example data
TRKGRP	NFATG1 NFA 0 ELO NCRT NIL MIDL 10
IBNFEAT	HOST 00 0 00 3 NFA NFA 6215878 Y 654 ACT N Y \$
IBNXLA	IBNXLA1 93 FEAT N N N NFAIMPL

The Network Facility Access translation process is shown in the flowchart that follows and shows the datafill content used for NFA, explicit access for an RES line.

## Network Facility Access (continued)

Table flow for Network Facility Access—explicit access for an RES line



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## Network Facility Access (continued)

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The following table lists the datafill content used in the flowchart example for explicit access. The example is for a RES line.

### Datafill example for Network Facility Access

Item	Example data
Called number	621-0099
Customer group name	AINRES
Datafill table	Example data
IBNXLA	RESXLA1 81 FTR 2 NFAEXPL NFATG2 81
IBNFEAT	HOST 00 0 02 20 NFA NFA 6210099 Y #33 INACT Y Y Y \$
TRKGRP	NFATG1 NFA 0 ELO NCRT NIL MIDL 10

### Limitations and restrictions

The following limitations and restrictions apply to Network Facility Access:

- The NFA line option is limited to the RES and MDC line class codes. If the RES\_AS\_POTS field of the RES\_SO\_SIMPLIFICATION office parameter is set to Y, NFA can also be added to 1FR and 1MR lines. Adding this option to those lines automatically changes the line to a RES line, but it appears to be a 1 FR or 1 MR with NFA as a RES Option. If RES\_AS\_POTS is set to N, NFA cannot be added to a 1FR or 1MR line, but can be added to a RES line; the line class code LCC is RES.
- Lines extending from line module or remote lines module peripherals are not supported by this feature.
- ISDN and electronic business set (EBS) equipment is not supported by this feature.
- The NFA trunk is restricted to immediate start outpulsing and wink start inpulsing.
- The NFA trunk is supported only on UTR-equipped digital trunk controllers (DTCs) or line trunk controllers (LTCs).
- The IP can dial the maximum number of digits for subscribers which they could dial themselves as a single-digit string. In BCS34, this maximum is set to 24 digits. The # digit, used as an end-of-digits indication, is not included in this count.
- NFA implicit access is not compatible with the warm line (WML) option.
- NFA is not allowed at all with the automatic line (AUL) option.

## Network Facility Access (continued)

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- The NFA trunk connection cannot be placed on hold. Any time the subscriber flashes while connected to the IP and that flash results in the connection being placed on hold, the connection is dropped.

*Note:* NFA Flash Processing is provided in feature NC0497 in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to feature NC0497 later in this chapter for additional information.

- An NFA explicit access cannot dial the ring again (RAG) access code.
- The SELSEQ field in table TRKGRP should not be datafilled with values ASEQ (assequential) or DSEQ (desequential) for any NFA trunks which can serve implicit connections. If the trunk is only being used for explicit connections, then this restriction does not apply.

If an implicit connection is attempted on a trunk which has been datafilled with ASEQ or DSEQ, no trunk circuit is selected and the implicit connection does not occur. The subscriber retains dial tone and can still dial digits manually.

- A new NFA trunk type is defined for connections to the IP. Even though it is implemented as a two-way trunk, no origination is allowed from this trunk. Any origination from this trunk puts it in lock-out state. This trunk can send an inverted wink during any IP connection to dial digits on behalf of a subscriber. Since this trunk is two-way type, parameters such as inpulsing start signal, inpulsing digit signaling, and inter-digit timeout must be datafilled in each trunk subgroup tuple. Refer to "Datafilling table TRKGRP" in this feature description for more details on this new trunk type.

When the IP is dialing for a subscriber, the # digit or inter-digital timeout indicates the end-of-digit inpulsing. The IP cannot indicate the end of digits by simply going on-hook. Normally, the IP should not drop the connection until after the DMS switch drops the trunk connection usually within two seconds following the # digit or at the end of the inter-digital timeout.

The following are restrictions or limitations placed on Speech-Activated Intelligent Dialing (SAID) Implicit Access to NFA as controlled by the office parameter, NFA\_IMPL\_DISCON\_RECON\_TIMER, located in Table OFCENG.

- If the DISC treatment is datafilled as an announcement or a tone followed by IDLE, SAID Implicit Access is denied for the length of time set in the



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## Network Facility Access (continued)

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timer value of this parameter providing the SAID implicit subscriber goes on-hook during the announcement or tone.

- Some features like conference calls, Call Transfer (CXR), and Call Pickup (CPU) manipulate parties in a call. As a result of this manipulation, a terminating party can become an originating party and the originating party can become a terminating party. The NFA\_IMPL\_DISCON\_RECON\_TIMER will only apply to the resulting terminating party.
- Other features such as Call Screening Monitoring and Intercept (CSMI) can remove a party from a call. When such a feature removes a terminating party, the call makeup is modified. The Processing Environment (FPE) does not distinguish between the originating and terminating parties and therefore, the timer in this parameter does not apply to this type of call.
- The cut-off on disconnect (COD) should not be assigned to a line that has access to SAID Implicit Access, since it will prevent the operation of the office parameter, NFA\_IMPL\_DISCON\_RECON\_TIMER, in the case of that particular line.

### Interactions

The following paragraphs describe the interactions between Network Facility Access and other functionalities.

#### Flash interactions

A major interaction with this feature concerns flash handling during a connection to the IP. When a subscriber that is connected to the IP flashes, if that flash would usually result in the IP connection being placed on hold, then that connection is dropped instead.

The effect of this action on existing calling features is discussed in the following paragraphs.

#### Three-way Calling

A subscriber with NFA can use the Three-way Calling (3WC) feature, provided that the subscriber is not connected to the IP while using the feature.

If connected to the IP, the following applies:

- If the subscriber is connected to the IP explicitly and flashes to initiate a 3WC, the explicit connection is dropped. The subscriber line remains busy and cannot receive any new originations unless it is returned to the on-hook state.
- The subscriber can connect to the IP, by way of an explicit connection only, during the second leg of a 3WC. If there is an explicit connection

## Network Facility Access (continued)

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established to the IP in this situation, and the subscriber flashes to bring in the held party, the IP connection remains. See Note 2. If the controller flashes before the IP has answered, the flash is ignored. A subscriber with active implicit access cannot receive an implicit connection to the IP following a user flash, or any other circumstance which results in delivery of recall dial tone to the line.

**Note 1:** The IP must answer before the controller can flash to bring back the held party.

**Note 2:** NFA Flash Processing is provided in feature NC0497 in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to feature NC0497 later in this chapter for additional information.

The IP can still dial a number for the subscriber if it is connected explicitly as the second leg of a 3WC. While the trunk is dialing the number, both parties (controller and other party in the first leg) are on hold. Once the trunk has been released and the call is routing, the controller is removed from hold, but the other party remains. The controller can now flash to bring the first party back into the conference, if desired, or leave the party on hold (as with regular 3WC functionality when a controller has dialed a call on the second leg).

An IP explicit connection can be involved in a 3WC chain, provided that it initially is in the second leg of the original 3WC; that is, it can never be placed on hold. This chain allows for the possibility of more than one IP connection to be conferenced together. One IP connection for each subscriber in the 3WC chain is possible.

If the NFA subscriber flashes in a context that would place the IP on hold during a 3WC chain, the trunk connection is dropped, instead. If the NFA subscriber goes on-hook, the IP connection is not transferred to the other parties in the 3WC chain, but is dropped instead.

**Note:** As with regular three-way calls, 3WC chaining does not support implicit connections to the IP.

### Call Waiting

A subscriber with NFA can use this feature, provided the subscriber is not connected to the IP. If the connection to the IP is in place, the following applies:

- If the subscriber is connected to the IP explicitly and another call arrives, the subscriber can flash to receive the call. If the subscriber does flash, they

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## Network Facility Access (continued)

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can still switch between the IP connection and the incoming call by flashing but the IP is not allowed to dial. Once the Call Waiting becomes inactive, the DMS can recognize the "IP dial" from the IP and the IP can initiate dialing.

- If the subscriber is connected to the IP explicitly and the IP is currently dialing a number for the subscriber, there is no call waiting tone.
- A subscriber connected to the IP implicitly does not receive call waiting tone at any point in time during the implicit connection.

### Call Hold

A subscriber cannot place a connection to the IP on hold. If he or she flashes in an attempt to do this, the IP connection is dropped.

After dialing the call hold (CHD) access code, the subscriber receives a new dial tone. The subscriber does not receive an implicit access to the NFA trunk, in this situation. This is an existing limitation of the CHD feature, which disallows access to any other features until after another number has been dialed following the new dial tone.

For example, the Warm Line (WML) and Automatic Line (AUL) features also do not operate. An implicit access to the NFA trunk would occur prior to any digits being dialed and is disallowed by CHD.

*Note:* NFA Flash Processing is provided in feature NC0497 in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to feature NC0497 later in this chapter for additional information.

### Call Park

A subscriber cannot park a connection to the IP, whether implicit or explicit. If the subscriber flashes in an attempt to do so, the connection to the IP is dropped.

### Other interactions

The Network Facility Access feature interacts with other features described in the following paragraphs.

### Speed Calling (SC)

An NFA subscriber with either Short or Long SC can use this feature with NFA. This includes instances involving connections to the IP. The subscriber can program an SC code to dial one of the NFA access codes.

## Network Facility Access (continued)

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For example, 70 can be set up to dial the access code for an explicit connection to the IP. This is consistent with existing SC functionality which provides the ability to program in other feature access codes.

The following existing restrictions to this functionality currently apply for feature access codes and also apply to the NFA access codes. The restrictions apply for both the explicit code and the implicit access toggle code.

- Speed calling validation (SCVAL) during programming—This customer group option, datafilled in table CUSTSTN, allows validation of speed call numbers as they are programmed into the speed call list. This feature does not support validation of feature access codes, and if present, feature access codes cannot be programmed into the speed call list.
- Ambiguous speed call (AMBISC)—This customer group option, also datafilled in table CUSTSTN, allows speed call entries to be dialed without use of the asterisk (\*). This option is incompatible with feature access codes if the code is in the range of speed call codes, that is, from 00 to 69. All feature access codes, including NFA access codes, should be in the range from 70 to 99. If one of the NFA access codes, either explicit or implicit toggle, is set in the range of 00 to 69, then it cannot be used in a speed call list if the AMBISC option is present for the customer group.

### Call Forwarding (CF)

A subscriber can use CF with NFA. However, the subscriber cannot forward his or her phone directly to the IP or directly to an explicit access feature code.

### Warm Line (WML)

Implicit access is not allowed for lines with the WML option. Explicit access is still allowed. When adding NFA to a line, if WML is present on the line, the IMPLCT\_ACC field is forced to be set to N. When adding WML to a line, if the line already has NFA with implicit access allowed, the option WML cannot be added to the line.

### Automatic Line (AUL)

NFA and AUL line options cannot be datafilled on the same line. This restriction is enforced by using table OPTOPT. A tuple for NFA is added into this table. The existing tuple for AUL has NFA added to the other existing options that are incompatible with AUL. The tuple for NFA has AUL listed as its incompatibility. The following example shows sample datafill for these options in table OPTOPT:

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**Network Facility Access** (continued)

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**MAP display example for table OPTOPT**

OPTION	INCOMPAT
-----	
AUL	
(ACB) (ACD) (AR) (ARDDN) (CALLOG) (CFBL) CFDA) (CFGD) (CFGDA) (CFW) (CNAB) (CNDB) (COT) (CPR) (CTD) (CUSD) (CWD) (DCBI) (DCPU) (DOR) (HOT) (LINEPSAP) (LNR) (MAN) (MPB) (MPH) (NFA) (ONI) (PBL) (RCHD) (SCL) (SCS) (SCU) (SC1) (SC2) (SC3) (SLVP) (SMDI) (TDN) (TDV) (UCD) (UCDSD) (WML) \$	
NFA	
(AUL) \$	

**Deluxe Spontaneous Call Waiting Identification (DSCWID)**

NFA and DSCWID can be datafilled on the same line. (This capability is enforced by using table LCCOPT.) However, the following interactions apply when the DSCWID subscriber with NFA is connected to the IP:

- If the DSCWID subscriber is connected to the IP explicitly and another call arrives, the subscriber may flash to receive that call; however, the connection to the IP may drop depending on the IP's configuration.
- If the DSCWID subscriber is connected to the IP explicitly and the IP is currently dialing a number for the subscriber, then there are no alerting tones.
- A DSCWID subscriber connected to the IP implicitly will not receive alerting tones at any time during the implicit connection.

**Executive busy override (EBO)**

If an EBO subscriber attempts to activate EBO against a call that is connected to an NFA trunk, either implicitly or explicitly, the activation fails and the EBO subscriber receives treatment. There is no effect on the NFA call. Barging into an NFA call at certain times (such as while the trunk is dialing) is not desirable.

**Call memory**

Incoming and outgoing call memory is updated when this feature is involved. This update includes instances in which the IP dials a number for the subscriber.

For example, if the IP dials a number for the subscriber, that number is reflected in the outgoing call memory. If the subscriber later activates last number redial, the number the IP had dialed is the number redialed.

## **Network Facility Access** (continued)

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### **Ring Again (RAG)**

The subscriber cannot use the RAG feature for a busy attempt to connect to the IP, either an explicit or implicit attempt. Such an attempt results in treatment.

The subscriber can use the RAG feature for a busy call which was dialed by the IP, from either an implicit or explicit connection. However, the subscriber must dial the RAG activation code.

After dialing a busy DN, the subscriber cannot then dial an explicit connection to the NFA trunk and then have the trunk dial the RAG access code to activate that feature. This existing limitation of the RAG feature because it uses routing data to determine which part to activate against. This routing data is updated when accessing the NFA trunk, removing information about the previous call.

### **Automatic call back**

The subscriber cannot use the automatic call back (ACB) feature for a busy attempt to connect to the NFA trunk, either an implicit or an explicit attempt.

The subscriber can have an NFA explicit access dial the ACB access code to activate this feature. For example, after dialing a busy line, the subscriber flashes, dials the NFA explicit access code, then has the NFA trunk dial the ACB activation code. This functionality is possible because ACB uses outgoing call memory instead of routing data. Outgoing call memory is not updated when a feature access code is dialed, so the last busy call is still recorded after accessing the NFA trunk.

### **Six-port conferencing features**

An explicit NFA connection cannot be added to a conference call which has been established using six-port conference circuits. This restriction applies to the Station Controlled Conference feature, as well as any other conferencing features which use these circuits

## **SAID Implicit Access**

When the office parameter NFA\_IMPL\_DISCON\_RECON\_TIMER is set to 0, there is no impact on current implementation of SAID Implicit Access.

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## Network Facility Access (continued)

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When the office parameter `NFA_IMPL_DISCON_RECON_TIMER` is set to a value greater than 0, SAID Implicit Access is denied under the following conditions:

- SAID Implicit Access subscriber is the called party of the previous call.
- SAID Implicit Access subscriber receives DISC treatment as a result of the calling party going on-hook first.

*Note:* The denial stage starts after the processing of the DISC treatment and lasts for the next `NFA_IMPL_DISCON_RECON_TIMER` seconds.

### SAID Implicit Access and COD

If a line subscribes to both COD and SAID Implicit Access, the blocking of SAID Implicit Access by the timer set in the office parameter, `NFA_IMPL_DISCON_RECON_TIMER` will not occur, since the open battery signal supplied to a subscriber line that has been assigned COD causes the line to immediately originate a call and SAID Implicit Access is not disabled for that call.

### SAID Implicit Access and Global COD

SAID Implicit Access does not interact with the office parameter, `GLOBAL_CUTOFF_ON_DISCONNECT`. This office parameter indicates if, when and how long an open battery signal is to be supplied to a line. Regardless of the value this parameter, the DISC treatment is eventually applied to the line, and SAID Implicit Access is blocked to the line for the next `NFA_IMPL_DISCON_RECON_TIMER` seconds.

*Note:* The duration of the open battery signal has no effect on the value of the `NFA_IMPL_DISCON_TIMER` office parameter. This timer is started after DISC connect treatment is applied, and DISC treatment occurs after the open battery signal has been supplied.

## Activation/deactivation by the end user

A subscriber is assigned NFA capabilities by assigning the NFA feature to his or her line in table `IBNFEAT`. When the NFA feature is specified, several additional fields are prompted for to outline subscriber-specific information. The entries in these fields indicate whether or not implicit and explicit accesses are allowed for the subscriber and whether or not implicit access capabilities are active.

A subscriber is allowed implicit access using the feature access code to activate or deactivate this ability. This access code acts as a toggle, switching the implicit access from `ACTIVE` to `INACTIVE`. After entering the implicit activation or deactivation access code successfully, the subscriber receives a

## Network Facility Access (continued)

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confirmation tone and is then provided dial tone or re-origination. If a subscriber is prohibited from implicit access, due to the line datafill, or if the subscriber does not have the NFA feature, he or she receives treatment if the implicit activation or deactivation code is dialed.

Returning the subscriber to dial tone (re-origination) after successfully dialing the feature access code allows the subscriber to determine whether or not the activation or deactivation of implicit access was successful. If the activation of implicit access takes place, the implicit connection to the IP takes place shortly after receiving new dial tone. If the deactivation of implicit access was implemented, there is no implicit connection to the IP.

In order to return the subscriber to dial tone after dialing the feature access code, the LNT tuple in table TMTCNTL must be properly datafilled. This tuple must be datafilled to return to IDLE after CONF treatment. This functionality affects all such confirmation treatments in the office, not just those resulting from NFA. Refer to the data schema section of this document for details concerning table TMTCNTRL.

### Activation/deactivation of Network Facility Access by the end user

#### *At your telephone*

- 1 For activation, caller goes off-hook and dials the feature access code (set up in table IBNXLA) to activate implicit access.

Response:

Confirmation tone is received and implicit access is allowed, assuming line datafill allows this feature. On an office basis, operating company personnel have the option of providing dial tone (or re-origination). This datafill is set up in table TMTCNTRL. An implicit connection to the IP is made, removing dial tone. If this is not provided, the subscriber hangs up and then is able to use the feature when going off-hook again.

- 2 For deactivation, caller goes off-hook and dials the feature access code to deactivate implicit access.

Response:

Confirmation tone is received. There is no implicit connection to the IP and dial tone is not removed.

## Billing

The Network Facility Access feature uses Bellcore billing format and uses a module code (047) and two call code types (174 and 175), which use an existing structure code (00001). AMA generation is based on the subscribers datafill. Refer to feature AN0435, "NFA: AMA Modification" for more information on these module and call code types.



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## Network Facility Access (continued)

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Call type 174 records explicit connections (in BCS34) and remote connections (in BCS35). The terminating DN corresponds to the feature access code used on explicit connections. The terminating DN contains zeros on remote connections.

Call type 175 records calls extended by the IP which would not otherwise generate AMA records.

The following two situations are involved with these codes:

- After a completed explicit connection between an NFA subscriber and the IP, a record with call code 174 using structure code 00001 is generated. The module code 047 is appended to that record. This module is discussed in detail in “Module code 047.”
- After an IP dials a call, regardless of whether the IP was accessed implicitly or explicitly, if that call was answered, one of the following two things occurs:
  - If the call does not generate any AMA record, a record with call code 175 and the module 047 appended is generated.
  - If the call does generate an AMA record, the module 047 is appended to that record.

Whether or not the records with the two call codes 174 and 175 are generated is also determined by the following three fields in the NFA line datafill of table IBNFEAT:

- **AMA\_EXPLCT** field
  - If set to N, then no AMA record with call code 174 is generated following an explicit connection to the IP.
  - If set to Y, then an AMA record with call code 174 is generated following an explicit connection to the IP. The terminating number is the feature access code and the module code 047 is appended with NFA specific information. The access method field of module 047 indicates explicit access with the digit 2.
- **AMA\_IPDIAL** field
  - If set to N, then no AMA record is generated following an IP-dialed call in which no other AMA records are generated.
  - In the case where the IP dials a call and another AMA record is normally generated, the module code 047 is still appended to that record, regardless of the setting of this field.
- **AMA\_REM** field (BCS35)—If set to Y, an AMA record with call code 174 is generated following a remote connection to IP. The originating number

## Network Facility Access (continued)

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is the subscribers DN and the terminating number is all zeros. Module 047 is appended with NFA specific information. The access method field of module 047 indicates remote access with the digit 3.

*Note:* The call codes 174 and 175 and module code 047 are only applicable if the call is answered. For explicit access, this means that the IP connection was completed and that the DMS switch received answer supervision from the IP and was able to set up the two-way voice path between the subscriber and the IP. For the IP-dialed case, this means that the party dialed by the IP answered the call.

### Call code 174

An AMA record with call code 174 is generated after an explicit connection to the IP has been completed. An explicit connection is considered completed if answer supervision is received from the IP. If the subscriber goes on-hook prior to the IP answering, the IP fails to answer, or if there is no free trunk to connect to the IP, the explicit connection is not completed and no AMA record is generated.

A complete explicit connection is considered finished once the IP connection has been dropped. This drop can occur due to the subscriber going on-hook, the IP going on-hook, the subscriber flashing, or the IP finishing dialing a number.

When a record with this call code is generated, a module with code 047 is also appended to that record. This module code is discussed in detail in "Module code 047."

A record of this call is not generated if the AMA\_EXPLCT field in the subscribers line datafill for NFA in table IBNFEAT is set to N.

The call code supports structure code 00001. This feature adds no fields to this structure code.

The terminating NPA field is filled entirely with zeros. This datafill is consistent with existing AMA records which involve dialing numbers other than directory numbers. For example, if the subscriber dials \*70 to access the NFA trunk explicitly, the TERM NFA field in the resulting 174 record is `00000C,' where 00000 is the value and C is the delimiter.

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**Network Facility Access** (continued)

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The following table lists the existing fields of the structure code 00001:

**Structure code 00001**

<b>Information</b>	<b>Table number</b>	<b>Number of characters</b>
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
Date	6	6
Timing indicator	7	6
Study indicator	8	8
Answer	9	2
Service observed, traffic sampled	10	2
Operator action	11	2
Service feature	12	4
Originating NPA	13	4
Originating number	14	8
Overseas indicator	15	2
Terminating NPA	16	6
Terminating number	17	8
Connect time	18	8
Elapsed time	19	10

For long duration calls, call code 174 also supports structure code 00001. A long duration call is indicated by having a module with code 022 appended to

## Network Facility Access (continued)

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the AMA record. A call is considered long duration if it is connected for more than 24 h.

Each night at midnight, an audit runs detecting such calls. At the time of the audit, if a call is detected which has been connected for greater than 24 h, it is marked as a long duration call and a long duration record is produced. This record is then produced each additional midnight that the call is maintained. When the call terminates, the normal AMA record is generated.

An NFA explicit connection can generate a long duration record, if it has been established for more than 24 h at the time of the audit. This record has the call code 174 with structure code 00001 and also has the 047 module appended to it in addition to module code 022.

*Note:* As with records using the 174 call code, if the line's AMA\_EXPLCT field is set to N, no long duration record with call code 174 is generated.

### Call code 175

An AMA record of this call code is generated after an answered call which either would not have normally generated any other AMA records or was dialed for the subscriber by the IP.

The AMA record is generated after the call has completed or one of the parties goes on-hook. Call code 175 supports structure code 00001. This feature adds no fields to the structure code. A record with call code 175 is not generated if the call generates any other AMA record or if the AMA\_IPDIAL field in the subscribers line datafill, table IBNFEAT, is set to N.

This call code has the module code 047 appended to it. For more information and an example of an AMA record with call code 047, refer to "Module code 047" and "Examples of AMA records" in this feature description. The format of the structure code 00001 is shown in the previous table.

Call code 175 also supports structure code 00001 for long duration calls. A long duration record has a module code 022 appended to it to indicate it is a long duration call. Any call dialed by the IP which produces the 175 call code and has no other AMA records associated with it also produces a long duration record, if the call duration warrants its generation. These records have the call code 175 with structure code 00001 and also have the module code 047 appended in addition to module code 022.

*Note:* As with normal records using the 175 call code, if the line's AMA\_IPDIAL field is set to N, no long duration record with call code 175 is generated.

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## Network Facility Access (continued)

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In addition, an IP dialed call which produces other AMA records has module code 047 appended to any long duration records that can result.

### Module code 047

Module 047 is appended to all NFA AMA records. This record is appended to both of the AMA records with call codes 174 and 175 and also to any existing AMA records generated following a call dialed by the IP.

The following table shows the information contained in module code 047.

#### Module code 047

Field name	Description	Number of characters	Table number
IP service code	Service code sent to IP during connection	6	105 (existing)
Access method	Type of access to IP	2	207 (new)
Subscriber ID	User ID of the subscriber connected to the IP	12	25 (existing)
Conversion required	Whether or not DP/DTMF conversion occurred	2	208 (new)
<p><b>Note:</b> Conversion required indicates that a DP/DTMF conversion actually occurred; that is, the subscriber entered at least one DP digit which was then converted to DTMF by the DMS switch. If conversion was set up to be provided but the subscriber never entered a digit, this field is set to 1.</p>			

The following are the field definitions:

#### IP service code

Binary coded decimal (BCD) characters	Meaning
1 - 5	Digits of SC
6	SIGN (hexadecimal C)

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**Network Facility Access** (continued)
 

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**Access method**

Binary coded decimal (BCD) characters	Meaning
1	1 - implicit access 2 - explicit access 3 - remote access (BCS35)
2	SIGN (hexadecimal C)

**Subscriber ID**

Binary coded decimal (BCD) characters	Meaning
1	0 (padding)
2 - 11	digits of USR_ID
2	SIGN (hexadecimal C)

**Conversion required**

Binary coded decimal (BCD) characters	Meaning
1	1 - no DP/DTMF conversion 2 - DP/DTMF conversion performed
2	SIGN (hexadecimal C)

**Examples of AMA records**

The following figures are examples of AMA records generated for call codes 006 and 175.

This first example shows an IP-dialed call that resulted in a record generated of call code 006 with structure code 700. Implicit access was used. The module code 047 is appended to this record.

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**Network Facility Access** (continued)
 

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**Call code 006 AMA record with module 047 appended**

```

HEX ID: AA STRUCTURE CODE:40700C CALL CODE:006C
SENSOR TYPE:036C SENSOR ID:0000000C
REC OFFICE TYPE:036C
REC OFFICE ID:0000000C DATE:80217C TIMING IND:00000C
STUDY IND:0000000C ANSWER:0C SERVICE OBSERVED:0C
OPER ACTION:0C SERVICE FEATURE:000C
ORIG NPA:919C ORIG NUMBER:9914276C OVERSEAS IND:1C
TERM NPA:00212C TERM NUMBER:2201234C
CONNECT TIME:0427380C ELAPSED TIME:000002360C
PRESENT DATE: 80217C PRESENT TIME: 0427380C
MODULE CODE:047C SERV CODE: 00333C ACCESS: 1C
SUBSCRIBER ID:09199917246C CONV REQ: 1C
MODULE CODE: 000C
  
```

The following example shows an IP-dialed call which would not have normally resulted in an AMA record being generated, but because of the datafill in table IBNFEAT, an AMA record is now produced. Record with call code 175 is generated with structure code 00001. The module code 047 is appended.

*Note:* Calls extended from remote access in BCS35 show the originating number field (ORIG NUMBER) as the subscribers home DN used during the remote access authorization process.

**Call code 175 AMA record with module 047 appended**

```

HEX ID: AA STRUCTURE CODE:40001C CALL CODE:175C
SENSOR TYPE:036C SENSOR ID:0000000C
REC OFFICE TYPE:036C
REC OFFICE ID:0000000C DATE:80217C TIMING IND:00000C
STUDY IND:0000000C ANSWER:0C SERVICE OBSERVED:0C
OPER ACTION:0C SERVICE FEATURE:000C
ORIG NPA:919C ORIG NUMBER:9914276C OVERSEAS IND:1C
TERM NPA:00203C TERM NUMBER:9920170C
CONNECT TIME:0427380C ELAPSED TIME:000002360C
MODULE CODE:047C SERV CODE: 00133C ACCESS: 2C
SUBSCRIBER ID:09199917246C CONV REQ: 2C
MODULE CODE: 000C
  
```

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## Network Facility Access (continued)

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The following example shows an explicit connection to the IP. A record with call code 174 is generated with the module code 047 appended. DP to DTMF conversion was performed.

**Note:** In BCS35, when the connection is initiated as a remote access, the terminating number (TERM NUMBER) field of the AMA record is all zeros.

### Call code 174 AMA record with module 047 appended

```

HEX ID: AA STRUCTURE CODE:40001C CALL CODE:174C
SENSOR TYPE:036C SENSOR ID:0000000C
REC OFFICE TYPE:036C
REC OFFICE ID:0000000C DATE:80217C TIMING IND:00000C
STUDY IND:0000000C ANSWER:0C SERVICE OBSERVED:0C
OPER ACTION:0C SERVICE FEATURE:000C
ORIG NPA:919C ORIG NUMBER:9914276C OVERSEAS IND:1C
TERM NPA:00000C TERM NUMBER:0000070C
CONNECT TIME:0427380C ELAPSED TIME:000002360C
PRESENT DATE: 80217C PRESENT TIME: 0427380C
MODULE CODE:047C SERV CODE: 12345C ACCESS: 2C
SUBSCRIBER ID:00000007246C CONV REQ: 2C
MODULE CODE: 000C

```

### Special handling of \* and # digits

The possibility of an occurrence of the \* or the # digits introduces a special restriction. These characters can exist in the terminating number. For example, a subscriber dials \*70 to access the NFA trunk. There is also a possibility of these characters existing in the service code. This service code can be datafilled with \* or # by the operating company.

If such a character exists in either the TERM NUMBER field or the 174 record or in the SERV CODE field of the 047 module, the character is suppressed. This functionality is due to a Bellcore specification that all BCD characters must be digits in the range of zero through nine. The symbols \* and # are normally represented by hex-B and hex-C digits respectively and are not allowed as values in these records.

If the \* or # character is in the middle or far right in the field, it is omitted and the field is right justified. If it is in the far left of a field, it is simply replaced by the pad value 0. For example, a service code of \*3#2 would appear in the SERV CODE field as 00032C: 000 is padding, 32 is the value, and C is the delimiter. If \*70 is dialed to access the NFA trunk explicitly, this value would appear in the TERM NUMBER field as 0000070C. The value 00000 is padding, 70 is the value, and C is the delimiter.



**Network Facility Access** (continued)

**Record generation tables**

This section contains information showing the records generated with NFA trunk connections.

The following table shows the record generated when an implicit connection to the NFA trunk dials a call (non-NFA) for the subscriber.

**Record generation—implicit connection**

AMA_EXPLCT	AMA_IPDIAL	Other AMA record(s) generated on NFA-dialed call	Call code 175	Call code 174	Module call 047 appended
Does not matter	Y	Y	N	N	Y - to other AMA record
Does not matter	Y	N	Y	N	Y - to 175 record
Does not matter	N	Y	N	N	Y - to other AMA record
Does not matter	N	N	N	N	N

This following table shows the records generated when an explicit connection to the NFA trunk then dials a call (non-NFA) for the subscriber.

**Record generation—explicit connection (Sheet 1 of 2)**

AMA_EXPLCT	AMA_IPDIAL	Other AMA record(s) generated on NFA-dialed call	Call code 175	Call code 174	Module call 047 appended
Y	Y	Y	N	Y	Y - to 174 and other AMA records
Y	Y	N	Y	Y	Y - to other AMA records
N	Y	Y	N	N	Y - to call code 175

**Network Facility Access** (continued)

**Record generation—explicit connection (Sheet 2 of 2)**

<b>AMA_EXPLCT</b>	<b>AMA_IPDIAL</b>	<b>Other AMA record(s) generated on NFA-dialed call</b>	<b>Call code 175</b>	<b>Call code 174</b>	<b>Module call 047 appended</b>
N	Y	N	Y	N	Y - to call code 174 and other AMA records
Y	N	Y	N	Y	Y - to call code 174
Y	N	N	N	Y	Y - to call code 174
N	N	Y	N	N	Y - to other AMA records
N	N	N	N	N	N

The following table shows the records generated if an implicit connection to the NFA trunk then dials an explicit connection.

**Record generation—implicit connection to explicit connection**

<b>AMA_EXPLCT</b>	<b>AMA_IPDIAL</b>	<b>Call codes 174 or 175 generated</b>	<b>Number of module codes 047 appended</b>
Y	Y	1 to 174	2 to 174
Y	N	1 to 174	2 to 174
N	Y	1 to 175	1 to 175
N	N	None	None

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**Network Facility Access** (continued)
 

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The following table shows the records generated if an explicit connection to the NFA trunk then dials another explicit connection.

**Record generation—explicit connection to explicit connection**

AMA_EXPLCT	AMA_IPDIAL	Call codes 174 or 175 generated	Number of module codes 047 appended
Y	Y	2 to 174	1 to first 174, 2 to second 174
Y	N	2 to 174	1 to first 174, 2 to second 174
N	Y	1 to 175	1 to 175
N	N	None	None

**Call examples**

The following sections describe the AMA results for various call examples.

**Explicit access, IP dials a call**

The subscriber goes off-hook and dials the explicit access code. An explicit connection to the IP is made. The IP dials a number for the subscriber and is disconnected. The AMA\_EXPLCT field in the subscribers line datafill is set to Y.

At this point, an AMA record is generated with the following information:

- A structure code of 00001 is generated with call type 174.
- Module code 047 is appended.

The call that the IP dialed is then answered. The subscriber converses with the called party and the call is completed.

The following are two possibilities that can occur:

- If this is a call that does not generate an AMA record and if the AMA\_IPDIAL field in the subscribers line datafill is set to Y, a record with call type 175 is generated, with module code 047 appended. If that field is set to N, no AMA record is generated.
- If this is a call which generates an AMA record, module code 047 is appended to that record. This generation occurs regardless of the datafill in the AMA\_IPDIAL field.

## **Network Facility Access** (continued)

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### **Explicit access, IP does not dial a call**

An AMA record with the following information is generated after an explicit connection is completed provided that the AMA\_EXPLCT field is set to Y:

- structure code of 00001 with call type 174
- module code of 047

If the AMA\_EXPLCT field is set to N, no AMA record is generated.

### **Explicit access, IP dials a call which is not answered**

If the AMA\_EXPLCT field is set to Y, an AMA record with the following information is generated after an explicit connection is completed:

- structure code of 00001 with call type 174
- module code of 047

If the AMA\_EXPLCT field is set to N, an AMA record is not generated.

No AMA record with call type 175 is generated for the IP-dialed call if the call was not answered. If any other AMA record is generated, the module code 047 is not appended.

### **Explicit access, IP fails to answer**

If the subscriber dials the explicit access code but is not successfully connected to the IP because the IP fails to answer or because there are no trunks available to the IP, no AMA record is generated.

### **Implicit access, IP dials a call**

If the subscriber goes off-hook and is implicitly connected to the IP, the IP dials a number for the subscriber and is disconnected.

The call that the IP dialed is then answered. The subscriber converses with the called party and then the call is completed.

Following are two AMA record possibilities that can occur:

- If this call does not generate an AMA record and if the AMA\_IPDIAL field in the subscribers line datafill is set to Y, a record with call type 175 is generated with module code 047 appended. If the AMA\_IPDIAL field is set to N, no AMA record is generated.
- If the call generates an AMA record, module code 047 is appended to that record, regardless of the setting of the AMA\_IPDIAL field.

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## Network Facility Access (continued)

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### **Implicit access, IP does not dial a call**

The subscriber goes off-hook and an implicit connection is made. The connection is completed without the IP dialing a call and the subscriber goes on-hook. No AMA record is generated.

### **Implicit access, IP dials a call which is not answered**

The subscriber goes off-hook and an implicit connection is made. The IP then dials a call for the subscriber. The call is unanswered and the subscriber goes on-hook. No AMA record is generated.

### **Explicit access, IP fails to answer**

The subscriber goes off-hook but the implicit connection is not successfully completed because the IP failed to answer or there are no trunks available to the IP. No AMA record is generated.

## **Station Message Detail Recording**

Network Facility Access does not affect Station Message Detail Recording.

## **Datafilling office parameters**

The following paragraphs apply to only to office parameters: NFA\_ANSWER\_DETECT\_TIME, NFA\_INVERTED\_WINK\_DURATION and NFA\_PRE\_DIAL\_DELAY\_TIME. When a subscriber goes off-hook, the following steps are made to establish a connection to an NFA trunk:

1. seize NFA trunk
2. outpulse subscribers service code and user ID
3. scan for answer
4. establish speech path between subscriber and NFA trunk
5. propagate inverted wink on NFA trunk

Three ways have been identified to save the call setup timing for NFA connections and to impact the pre-dial delay timing, the inverted wink duration, and answer detection filter time after the off-hook signal of a trunk has activated the NFA feature. Each of these values may be adjusted.

Default values for the pre-dial delay between seizing an NFA trunk and outpulsing the first digit, the filter time for detecting the answer, and the duration of the inverted wink which is sent following cut-through of a speech path between the subscriber and the NFA trunk are set in these parameters. Each of these values may be adjusted, however the the recommended value of each of these parameters is their default value. These default values are based upon constant values carried over from past practice.

## Network Facility Access (continued)

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Customers have a method of fine tuning the call setup timing by way of three office parameters in NFA implicit, explicit, and remote access calls. Potentially, the amount of time that it takes to establish an NFA trunk connection could be decreased by up to 210 ms. The recommended value of these parameters is their default value.

These parameters should not be decreased unless the customer is using an IP and transmission medium to the DMS-100 switch which can support the shorter timing values. Decreasing any of these office parameters from the default value can impact the grade of service for NFA customers.

The following paragraphs apply only to the office parameter, NFA\_IMPL\_DISCON\_RECON\_TIMER:

This parameter is used to enable or disable the blocking of subscriber access to Speech-Activated Intelligent Dialing (SAID) on an office wide basis. The value of this parameter represents the value of a timer used to determine if the SAID Implicit Access is triggered under the usual conditions.

If the value of the timer is set to 0, the SAID Implicit Access is triggered under the usual conditions.

If the value of the timer is greater than zero SAID Implicit Access is blocked for the number of seconds specified in the timer providing both of the following conditions are met:

- SAID Implicit Access subscriber is the called party of the previous call.
- SAID Implicit Access subscriber receives disconnect (DISC) treatment as a result of the calling party going on-hook first.

If the value of the timer is set to greater than zero, SAID Implicit Access is blocked for the number of seconds set for the timer. SAID Implicit Access is blocked for the next call originated by the SAID Implicit Access subscriber.

**Note:** If the timer value is set too low so that the timer expires before dial tone is given back to the subscriber, SAID Implicit Access is triggered.

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## Network Facility Access (continued)

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The following table shows the office parameters used by Network Facility Access. For more information about office parameters, refer to *Office Parameters Reference Manual*.

### Office parameters used by Network Facility Access (Sheet 1 of 2)

Table name	Parameter name	Explanation and action
OFCENG	NFA_ANSWER_DETECT_TIME	<p>This parameter indicates the filter time for detecting answer on an NFA trunk.</p> <p>Enter 7, 8 or 9 (70, 80 or 90 ms) for an answer. If the customer is using an IP and transmission medium which can support the shorter timing values, the value can be decreased from the default of 9 (90 ms).</p> <p>The following message will be displayed whenever the value of this parameter is changed from the default of 9:</p> <p>WARNING: DECREASING THIS OFFICE PARAMETER FROM THE DEFAULT OF 9 CAN IMPACT THE GRADE OF SERVICE FOR NFA SUBSCRIBERS.</p>
OFCENG	NFA_IMPL_DISCON_RECON_TIMER	<p>This parameter is used to enable or disable the blocking of subscriber access to Speech-Activated Intelligent Dialing (SAID) on an office wide basis.</p> <p>Leave value of the parameter set to default value of 0, to disable blocking of access to SAID on an office wide basis.</p> <p>Enter a value from 1 to 7 seconds to enable the blocking of access to SAID for the duration of the value entered.</p> <p>WARNING: IF THE TIMER VALUE IS SET TOO LOW SO THAT THE TIMER EXPIRES BEFORE DIAL TONE IS GIVEN BACK TO THE SUBSCRIBER, SAID IMPLICIT ACCESS IS TRIGGERED.</p>

**Network Facility Access** (continued)

**Office parameters used by Network Facility Access (Sheet 2 of 2)**

Table name	Parameter name	Explanation and action
OFCENG	NFA_INVERTED_WINK_DURATION	<p>This parameter indicates the upper bound of the duration of the inverted wink, which is propagated by the DMS switch on the NFA trunk when the speech path is established between the subscriber and the NFA trunk.</p> <p>Enter a value from 6 to 10 (ranging between 50 to 60 ms for 6 and 90 to 100 ms for 10). If the customer is using an IP and transmission medium which can support the lower values, the value can be decreased from the default of 10.</p> <p>The following message will be displayed whenever the value of this parameter is changed from the default of 10:</p> <p>WARNING: DECREASING THIS OFFICE PARAMETER FROM THE DEFAULT OF 10 CAN IMPACT THE GRADE OF SERVICE FOR NFA SUBSCRIBERS.</p>
OFCENG	NFA_PRE_DIAL_DELAY_TIME	<p>This parameter indicates the amount of pre-dial delay between seizing an NFA trunk and outputting the first digit.</p> <p>Enter a value from 15 down to 0 (150 ms to 0 ms). If the customer is using an IP and transmission medium which can support the lower values, the value can be decreased from the default of 15.</p> <p>The following message will be displayed whenever the value of this parameter is changed from the default of 15:</p> <p>WARNING: DECREASING THIS OFFICE PARAMETER FROM THE DEFAULT OF 15 CAN IMPACT THE GRADE OF SERVICE FOR NFA SUBSCRIBERS.</p>

**Note:** NFA: Remote Access, Flash Processing feature, NC0497 in BCS35, introduces a parameter for UTR override which can be patched back to a BCS34 load.



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## Network Facility Access (continued)

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### Datafill sequence

The following table lists the tables that require datafill to implement Network Facility Access. The tables are listed in the order in which they are to be datafilled.

#### Datafill tables required for Network Facility Access (Sheet 1 of 2)

Table	Purpose of table
OFCENG	Office Engineering Table. This table contains data on engineering parameters for the office. Refer to "Datafilling office parameters" for how Network Facility Access affects office parameters.
CLLI	Common Language Location Identifier. This table is used to uniquely identify the far end of each announcement, tone, trunk group, test trunk, national milliwatt test lines, and service circuit.
TRKGRP	Trunk Group. This table contains information about trunk groups.
TRKSGRP	Trunk Subgroup. This table contains information about each subgroup associated with a trunk group defined in table TRKGRP.
TRKMEM	Trunk Member. This table lists the data for each trunk specified in the trunk group and subgroup tables.
DIGCOL	IBN Digit Collection. This table is required for the Integrated Business Network (IBN) and Residential Enhanced Services (RES) table-driven digit collection system.
XLANAME	Translator Names. This table stores the default data, including the allowable digilator range, for each translator.
CUSTENG	Customer Group Engineering. This table lists the values for the engineering parameters and options for each of the customer groups.
CUSTHEAD	Customer Group Head. This table lists the names assigned to the blocks of data in table IBNXLA that store the data for the translation of digits.
CUSTNAME	Customer Name. This table is a switch created table that enables the change of a customer character name through one table. Table CUSTNAME assigns an identifier that refers to the customer group name.
NCOS	Network Class of Service. This table consists of Network Class of Service (NCOS) numbers that are assigned to Attendant Consoles (AC), Integrated Business Network (IBN), or Residential Enhanced Services (RES) stations, incoming or incoming side of two-way IBN trunk groups, authorization codes, and customer groups.

## Network Facility Access (continued)

### Datafill tables required for Network Facility Access (Sheet 2 of 2)

Table	Purpose of table
CUSTSTN	Customer Group Station Option. This table is required for a switching unit with North American translations and the Meridian Digital Centrex (MDC) or the feature AG0508 (Residential Enhanced Services) (RES). This table lists the station options assigned to each of the customer groups.
IBNLINES (Note)	<p>IBN Line Assignments. This table contains the line assignments for data channel links for the Bulk Calling Line Identification (BCLI) feature under the format name of BL.</p> <p><b>Note:</b> 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.</p>
LINEATTR	Line Attribute. This table assigns line attributes to MDC stations and attendant consoles.
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.
IBNFEAT (Note)	<p>IBN Line Feature. This table lists line features that are assigned to the IBN lines listed in table IBNLINES.</p> <p><b>Note:</b> 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.</p>

### Datafilling table TRKGRP

A trunk group type, NFA, is defined by this activity. The NFA trunk group type is a two-way trunk type with DTMF signaling capability. Even though it is a two-way trunk, NFA trunks cannot originate incoming calls to the DMS-100 switch. If an NFA trunk originates an incoming call to the DMS-100 switch, the trunk is placed in a lockout state.

The current trunk (TRK) logs to indicate trunk transition to and from lockout state are pegged. The NFA trunk should support testing similar to standard trunk outgoing (TO) type trunk. If no idle NFA trunk is available for a call, the existing peg to indicate a call being deflected from an outgoing group is incremented. This OM is TRK\_NOVFLATB.

NFA implements a datafill field, ANSTOUT, to specify the time in seconds within which the trunk must respond with answer supervision after its seizure.

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## Network Facility Access (continued)

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Typically, this time should be less than the ROH timer used to time the receipt of the first digit from a subscriber.

The NFA trunks must be equipped only on DTC and LTC peripherals. These peripherals must be equipped with UTRs.

**Note:** The trunk group name used for NFA trunk group type must be datafilled in table CLLI prior to its use in table TRKGRP, as is done currently for any other tuple in table TRKGRP.

The following table shows the datafill specific to Network Facility Access for table TRKGRP. Only those fields that apply directly to Network Facility Access are shown. For a description of the other fields, refer to the data schema section of this document.

### Datafilling table TRKGRP

Field	Subfield or refinement	Entry	Explanation and action
GRPKEY		see subfield	Group type. This field consists of subfield CLLI.
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. This is the name of the identifying trunk group, previously datafilled in table CLLI.
GRPINFO		see subfields	Variable group data. These subfields vary depending upon the GRPTYP datafill.
	GRPTYP		Group type. The value NFA is added to the range of values for this existing field. Group type NFA must be used for all NFA trunk connections to an IP.
	ANSTOUT	numeric (5 to 15)	Answer time-out. This is a field added for NFA trunk group type. It specifies time in seconds within which the far end of the NFA trunk has to respond with answer supervision after its seizure from the DMS-100 switch. Valid entries are from 5 to 15.

### Datafill example for table TRKGRP

The following example shows sample datafill for table TRKGRP. In the example, Network Facility Access is assigned to trunk group NFATKG1, and the field ANSTOUT is assigned the value of 12.

---

**Network Facility Access** (continued)
 

---

**MAP display example for table TRKGRP**

Table: TRKGRP									
GRPKEY					GRPINFO				
-----									
NFATKG1		NFA	0	ELO	NCRT	NIL	MIDL	12	

**Datafilling table TRKSGRP**

The trunk subgroup tuple provides information for the type of signaling, digit outpulsing, and inpulsing. The standard signaling data selector tuple is used, but as a result of NFA, some of the fields are restricted to specific values.

Even though an NFA trunk is not allowed origination, it is implemented as a two-way trunk type. An NFA trunk has the capability to specify parameters in its trunk subgroup tuple, such as incoming pulsing type, incoming digit dial start signal, and inter-digital timing.

This capability is provided in addition to parameters related to its use as an outgoing trunk. These inpulsing parameters are necessary when this type of trunk sends inverted wink to the DMS-100 switch to dial digits for the subscriber.

The NFA trunk must use immediate signaling for outpulsing of digits to the IP. The NFA trunk is restricted to wink start signaling for incoming direction when the IP dials digits for the subscriber during a stable call. The immediate and wink signaling parameters follow existing standards of the LSSGR TR-TSY-000064.

**Note:** Table TRKSGRP is not modified by NFA. However, the fields used for NFA trunk group type are restricted to specific values.

The following table shows the datafill specific to Network Facility Access for table TRKSGRP. Only those fields that apply directly to Network Facility

---

**Network Facility Access** (continued)

---

Access are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table TRKSGRP (Sheet 1 of 3)**

Field	Subfield or refinement	Entry	Explanation and action
SGRPKEY		see subfields	Subgroup key. This field is composed of subfields CLLI and SGRP.
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. CLLI is any valid defined trunk group name, as previously defined in table CLLI.
	SGRP	0 or 1	Subgroup number. Valid entries are 0 for digital or 1 for analog.
CARDCODE		DS1SIG	Card code. The type of card for NFA is restricted to DS1SIG. Enter DS1SIG in this field.
SGRPVAR		see subfields	Variable subgroup data. For standard, this field consists of the subfields SIGDATA, DIR, IPULSTYP, ISTARTSG, OVL P, PSPDSEIZ, PARTDIAL, OPULSTYP, OSTARTSG, IDGTIME, NUMSTOPS, GLAREYD, CCONT, RINGBCK, ESUPR, SAT, REMBSY, DIALMODE, TRKGRDTM, and ECSTAT.
	SIGDATA	STD	Signaling data. Signaling data selector is restricted to standard signaling. Enter STD for standard.
	DIR	2W	Direction. The direction of NFA trunk group is only two way. Enter 2W.
	IPULSTYP	DT	Incoming type of pulsing. The incoming type of pulsing is restricted to Digitone (DT). Enter DT.
	ISTARTSG	WK	Incoming start dial signal. The incoming start dial signal is restricted to wink (WK). Enter WK.
	OVL P	N	Overlap outpulsing. The overlap outpulsing is not applicable to DP trunks. It is set to N. Enter N.
	PSPDSEIZ	2 to 30 s	Permanent signal or partial dial on seizure timing. Valid entries are from 2 to 30 s.
	PARTDIAL	2 to 30 s	Partial-dial timing. Valid entries are from 2 to 30 s.

**Network Facility Access** (continued)

Datafilling table TRKSGRP (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	OPULSTYP	DT	Outgoing type of pulsing. Outgoing type of pulsing is restricted to DT. Enter DT.
	OSTARTSG	IM	Outgoing start dial signal. The outgoing start dial signal is restricted to immediate dial (IM). Enter IM.
	IDGTIME	0 to 100	Inter-digital timing. Enter a value for inter-digital timing from 0 to 100. Enter the digit for the number of 10 ms for timing between digits.  For example, a value of 5 will produce a 50-ms break after each outpulsed digit.
	NUMSTOPS	0	Number of stop/goes. Number of stop/goes is used with DP intertoll trunks. It is not applicable to NFA trunks and is restricted to 0. Enter 0.
	GLAREYD	N	Yield to glare. Glare yield is used for two-way trunks. Since NFA trunks are not allowed to originate incoming calls, this field is restricted to N (no). Enter N.
	CCONT	NO	Coin control. Coin control is not applicable to NFA and is restricted to no. Enter NO.
	RINGBCK	NO	Ringback. Ringback is not applicable to NFA and is restricted to no. Enter NO.
	ESUPR	N	Echo suppressor. Echo suppressor is not applicable to NFA and is restricted to N. Enter N.
	SAT	N	Satellite. Satellite routing is not applicable to NFA and is restricted to N. Enter N.
	REMBSY	N	Remote make busy. Remote make busy is not allowed for NFA and is restricted to N. Enter N.
	DIALMODE	M	Dial mode. Dial mode is restricted M (machine dialed) since the IP is dialing from the far end. Enter M.

**Network Facility Access** (continued)

**Datafilling table TRKSGRP (Sheet 3 of 3)**

Field	Subfield or refinement	Entry	Explanation and action
	TRKGRDTM	1 to 255	Trunk guard timing. Trunk guard timing is used with its existing allowed range of values from 1 (10 ms) to 255 (2.5 s).
	ECSTAT	UNEQ	Echo canceller status. Echo equipped status is not applicable to NFA trunks and is restricted to unequipped (UNEQ). Enter UNEQ.

**Datafill example for table TRKSGRP**

The following example shows sample datafill for table TRKSGRP. In the example, Network Facility Access is assigned to the subgroup key (SGRPKEY) field and defines the common language location identifier (CLLI) for NFA trunk type.

**MAP display example for table TRKSGRP**

```

Table: TRKSGRP

SGRPKEY          CARDCODE                      SGRPVAR
-----
NFATKG1         DS1SIG
      STD 2W DT WK N 10 10 DT IM 5 0 N NO NO N N N M 50 UNEQ
    
```

**Error messages for table TRKSGRP**

The following error messages apply to table TRKSGRP.

**Error messages for table TRKSGRP (Sheet 1 of 2)**

Error message	Explanation and action
NFA trunk must be two way trunk	Subfield DIR in field SGRPVAR needs to be datafilled with 2W.
NFA trunk must be wink start incoming	Subfield ISTARTSG in field SGRPVAR needs to be datafilled with WK.
NFA trunk must NOT have OVERLAP outpulsing	Subfield OVLP in field SGRPVAR needs to be datafilled with N.
NFA trunk must be DIGITONE outpulsing	Subfield OPULSTYP in field SGRPVAR needs to be datafilled with DT.

## Network Facility Access (continued)

### Error messages for table TRKSGRP (Sheet 2 of 2)

Error message	Explanation and action
NFA trunk must be IMMEDIATE START outgoing	Subfield OSTARTSG in field SGRPVAR needs to be datafilled with IM.
NFA trunk must NOT have STOP AND GO	Subfield NUMSTOPS in field SGRPVAR needs to be datafilled with 0.
NFA trunk must NOT have GLARE YIELD	Subfield GLAREYD in field SGRPVAR needs to be datafilled with N.
NFA trunk must NOT have COIN CONTROL	Subfield CCONT in field SGRPVAR needs to be datafilled with NO.
NFA trunk must NOT have RING BACK	Subfield RINGBCK in field SGRPVAR needs to be datafilled with NO.
NFA trunk must NOT have ECHO SUPPRESSOR	Subfield ESUPR in field SGRPVAR needs to be datafilled with N.
NFA trunk must NOT have SATELLITE ROUTING	Subfield SAT in field SGRPVAR needs to be datafilled with N.
NFA trunk must NOT have REMOTE BUSY	Subfield REMBSY in field SGRPVAR needs to be datafilled with N.
NFA trunk must be set to MACHINE DIALED	Subfield DIALMODE in field SGRPVAR needs to be datafilled with M.
ECSTAT must be UNEQ for NFA trunks	Subfield ECSTAT in field SGRPVAR needs to be datafilled with UNEQ.

### Datafilling table TRKMEM

Table TRKMEM indicates the physical location of a trunk, as well as the trunk group and trunk subgroup to which it belongs. If the trunk group type is NFA, its physical location is confined either to a DTC or to an LTC peripheral. These peripherals must be equipped with UTRs.

The following table shows the datafill specific to Network Facility Access for table TRKMEM. Only those fields that apply directly to Network Facility



**Network Facility Access** (continued)

Access are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table TRKMEM**

Field	Subfield or refinement	Entry	Explanation and action
MEMVAR			Variable data for members. For an NFA trunk member, the type of peripheral module (PM) in this field must be either a DTC or a LTC and must be equipped with UTR.

**Datafill example for table TRKMEM**

The following example shows sample datafill for table TRKMEM. In the example, Network Facility Access is assigned to a DTC.

**MAP display example for table TRKMEM**

```

Table:  TRKMEM

CLLI           EXTRKNM   SGRP           MEMVAR
-----
NFATKG1       0           0           DTC  0  2  4
    
```

**Error messages for table TRKMEM**

The following error messages apply to table TRKMEM.

**Error messages for table TRKMEM**

Error message	Explanation and action
PM is not equipped with UTR for NFA	Datafill was attempted on a circuit with no UTRs. Make certain the circuit has UTRs and re-enter datafill.
NFA trunk must be on LTC or DTC	If the PM is not a LTC or DTC, this error message will result. For a NFA trunk member, the type of PM must be datafilled as a LTC or DTC.

**Datafilling table IBNXLA**

The implicit mode for NFA can be activated and deactivated from a subscriber line which has the NFA option. This is provided by defining an access code in

## Network Facility Access (continued)

---

table IBNXLA for NFA implicit mode. The active or inactive status of the implicit mode is toggled every time that the access code is entered from the subscriber line. Refer to "Datafill example of table IBNXLA" in this feature description for example datafill of the NFA implicit activation or deactivation access code in table IBNXLA.

Based on the feature translator specified in table NCOS, the entries in table IBNXLA determine which access code or codes are valid for a subscriber to dial to activate NFA explicit mode. More than one access code can be specified. Each access code should specify a unique service code which is sent to the IP to indicate the service desired.

Using the FTR selector in subfield TRSEL of table IBNXLA, this feature creates a value, NFAEXPL. This value can be entered for the FTR\_NAME subfield to identify NFA explicit mode. There are two subfields associated with the NFAEXPL entry:

- EXPLTRGP subfield  
This field identifies the trunk group used to connect to the IP for explicit access. This trunk group must be an NFA trunk group previously datafilled in table TRKGRP.
- EXPL\_SC subfield  
This field specifies a 1 to 5 digit service code which is outpulsed to the IP during an explicit connection. The digits are in the range from 0 to 9, # or \*.

The trunk group selected for the EXPLTKGP subfield must be previously datafilled in table TRKGRP. Also, the NTXR25AA feature package must be present in the load or NFAIMPL and NFAEXPL do not appear in the valid range of values for their respective fields.

**Note:** Options are added to IBNXLA using table control. The Service Order System (SERVORD) cannot be used.

The following table shows the datafill specific to Network Facility Access for table IBNXLA. Only those fields that apply directly to Network Facility

**Network Facility Access** (continued)

Access are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table IBNXLA**

Field	Subfield or refinement	Entry	Explanation and action
RESULT		see subfields	Result. This field consists of several subfields, depending upon the feature datafilled.
	FEATURE	NFAIMPL	Feature field. Option NFAIMPL is added to this table for use in activation or deactivation of the implicit access for NFA subscribers. Enter NFAIMPL if datafilling for implicit access.
	FTR_TYPE	NFAEXPL	FTR selector. Option NFAEXPL is added to datafill access codes for explicit access. Enter NFAEXPL if datafilling for explicit access.  <b>Note:</b> If FTR_TYPE is set to NFAEXPL, subfields EXPLTKGP and EXPL_SC require datafill.
	EXPLTKGP	trunk group	Explicit trunk group. Enter the trunk group over which an explicit connection is made. The trunk group entered must have been already datafilled in table TRKGRP with a GRPTYP of NFA.
	EXPL_SC	1 to 5 digits (0 to 9, #, *, or \$)	Explicit service code. Enter the service code to be outpulsed over the NFA trunk during an explicit access. Valid entries are from 1 to 5 digits, from 0 to 9, #, or *. Also, a \$ can be entered to indicate that a service code is not assigned to this subscriber.

**Datafill example for table IBNXLA**

The following example shows sample datafill for table IBNXLA. In the example, four access codes are set up for implicit and explicit access, two for implicit and two for explicit access.

## Network Facility Access (continued)

### MAP display example for table IBNXLA

Table: IBNXLA						
KEY					RESULT	
-----						
NFAXLA1	33		FEAT	N	N N N NFAIMPL	
NFAXLA2	33		FEAT	N	N N N NFAIMPL	
NFAXLA1	44	FTR 2	NFAEXPL	NFATKGP1	9999	
NFAXLA2	145	FTR 3	NFAEXPL	NFATKGP3	145	

Listed below is an example of the datafill for the NFA implicit activation or deactivation access code. The example shows the ability to assign different access codes for subscribers which are assigned different feature translator names in XLANAME field.

### MAP display example for table IBNXLA

Table: IBNXLA						
KEY					RESULT	
-----						
IBNXLA1	93		FEAT	N	N N N NFAIMPL	
NFAXLA2	94		FEAT	N	N N N NFAIMPL	

Listed below is an example of the datafill for NFA explicit access codes. Subscribers assigned to the same customer group can be assigned to different NCOS, which allows for the assignment of distinct feature translator names.

The following example illustrates a number of things. First, those subscribers assigned the feature translator of IBNXLA1 are capable of entering two NFA access codes to access the IP by way of two distinct trunk groups. Subscribers assigned the feature translator of NFAXLA12 are only capable of entering one NFA access code. Also, the service code sent to the IP, field EXPL\_SC, can be the same digits as the dialed access code, or can be any digit string from one to five digits in length.

**Network Facility Access** (continued)

**MAP display example for table IBNXLA**

Table: IBNXLA							
KEY							RESULT
-----							
IBNXLA1	81	FTR	2	NFAEXPL	NFATG1	81	
IBNXLA1	82	FTR	2	NFAEXPL	NFATG2	82	
NFAXLA2	81	FTR	2	NFAEXPL	NFATG1	54#81	

POTS subscribers are able to dial digits without any prefix (such as \*) to activate certain features. For example, a POTS subscriber can dial 72 to program his or her call forwarding. If a POTS subscriber has NFA added to his or her line, that line is changed to a RES line. Special datafill is possible for RES lines to retain the ability to activate features by use of the AMBIG selector in table IBNXLA. The following example uses call forward programming to illustrate this functionality.

**MAP display example for table INXLA**

Table: IBNXLA							
KEY							RESULT
-----							
RESXLA1	72	FEAT	N	N	N	CFWP	
RES1	72	AMBIG	2	RESXLA1	RESXLA1		

**Datafilling table CUSTSTN**

Table CUSTSTN is used to specify options on a customer group basis. This feature creates an NFA option for implicit access.

The following are two subfields associated with this NFA option:

- IMPLTRGP subfield

This subfield identifies the trunk group used to connect to the IP for implicit access. This trunk group must be an NFA trunk group previously datafilled in table TRKGRP.

- STDSC subfield

When the subscriber line has a stuttered dial tone, this subfield specifies a one to five-digit special service code which is outputted to the IP instead of the service code entered for field IMPLCT\_SC in table IBNFEAT. The digits used are in the range from 0 to 9, #, or \*. Also, a \$ can be entered to indicate that a service code is not assigned to this subscriber.

## Network Facility Access (continued)

This NFA option must be added to table CUSTSTN in order for any of the lines in the customer group to have implicit access. If not, the IMPLCT\_ACC field for NFA in table IBNFEAT cannot be set to Y when adding the NFA option to a subscriber line.

Refer to “Datafill example for table CUSTSTN” in this feature description for an example of the datafill for the NFA option in table CUSTSTN.

**Note:** The implicit trunk group name must already be datafilled in table TRKGRP.

The following table shows the datafill specific to Network Facility Access for table CUSTSTN. Only those fields that apply directly to Network Facility Access are shown. For a description of the other fields, refer to the data schema section of this document.

### Datafilling table CUSTSTN (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CUSTNAME		alphanumeric (1 to 16 characters)	Customer group name. This field specifies a customer group name. Enter the name which is assigned to the customer group.
OPTNAME		NFA	Option name. This field specifies an option name. Enter NFA.
OPTION		NFA	Option. This field specifies an option name. Enter NFA.  <b>Note:</b> If OPTION is set to NFA, subfields IMPLTKGP and STDSC require datafill.

**Network Facility Access** (continued)

Datafilling table CUSTSTN (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	IMPLTKGP	alphanumeric	<p>Implicit trunk group. Enter the alphanumeric trunk group name over which an implicit connection is made for lines in the customer group.</p> <p><b>Note:</b> The trunk group chosen must already be datafilled in table TRKGRP with a GRPTYP of NFA.</p>
	STDSC	vector of one to five digits (0 to 9, #, *, or \$)	<p>Stuttered dial tone service code. This subfield is a vector of one to five digits. Enter the service code (0 - 9, #, *) which is outputted over the implicit trunk group (IMPLTKGP) during an implicit connection, if the line has stuttered dial tone. Also, a \$ can be entered to indicate that a service code is not assigned to this subscriber.</p>

**Datafill example for table CUSTSTN**

The following example shows sample datafill for Network Facility Access in table CUSTSTN. In the example, the customer groups IBNTST and RESGRP are assigned the NFA option.

**TRAVER output example for tabel CUSTSTN**

```

Table:  CUSTSTN

CUSTNAME      OPTNAME                      OPTION
-----
IBNTST        NFA                          NFA  NFATKGP1  44
RESGRP        NFA                          NFA  NFATKGP2  55
    
```

**Datafilling table IBNFEAT**

Table IBNFEAT 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 LCCOPT**

The following table shows the datafill specific to Network Facility Access for table LCCOPT. Only those fields that apply directly to Network Facility

## Network Facility Access (continued)

Access are shown. For a description of the other fields, refer to the data schema section of this document.

### Datafilling table LCCOPT

Field	Subfield or refinement	Entry	Explanation and action
COMPAT			Compatible line option. This field contains all options which are compatible with the line class code specified in the key field.

### Datafill example for table LCCOPT

The following example shows sample datafill for Network Facility Access in table LCCOPT, which is a read-only table. In the example, the compatible options for table LCCOPT are shown.

### TRAVER output example for table LCCOPT

```

Table:  LCCOPT

LCC                                     COMPAT
-----
RES
(ACB) (ACRJ) (AMATEST) (AR) (ARDDN) (ATC) (BCLID)
(CCW) (CDT) (CFBL) (CFDA) (CFDGA) (CFRA) (CFW) (CIR) (CLF)
(CPU) (CTD) (CWR) (CWT) (CXR) (DDN) (DGT) (DLH) (DNH) (DOR)
(ftmgrp) (GIC) (GND) (HOT) (ILB) (IMB) (INT) IRR) (LCDR)
(LOR) (LPIC) (MBK) (MDN) (MLH) (MSB) (MWT) (NAME) (NDC)
(NFA)
(RCVD) (RCHD) (RMB) (RMP) (RMR) (RMS) (RSP) (RSUS) (SACB)
(SCA)
(TBO) (T N) (TERM) (TES) (TFO) (TRMBOPT) (3WC) (WML) (WUCR)
$
    
```

## Translation verification tools

The following paragraphs describe the Translation verification (TRAVER) tools in which the Network Facility Access feature is involved.

### TRAVER

The following examples show the output from TRAVER when it is used to verify Network Facility Access. As with other features, NFA is not directly supported by TRAVER. However, it shows routing up to the tuple in table IBNXLA. For explicit access, a message indicating that the code activates an explicit access is also generated.



---

## Network Facility Access (continued)

---

### TRAVER for NFA for implicit access activation or deactivation

The following TRAVER example shows implicit access activation or deactivation and shows the translations necessary to set up the NFA implicit activation or deactivation access code(s). This example is for an MDC line. The first `b` in the first line indicates an `\*` symbol.

The following example shows the output from TRAVER when it is used to verify Network Facility Access.

### TRAVER output example for Network Facility Access for explicit access activation/deactivation

```
>traver l 6215878 'b93' b
TABLE IBNLINES
HOST 00 0 00 1 0 DT STN IBN 6215878 IBNTST 0 0 613 $
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE NCOS
IBNTST 0 0 0 NFAIBN0 ( XLAS CXT3 IBNXLA1 NDGT) $
TABLE CUSTHEAD:  CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT
AND DIGCOL
TABLE DIGCOL
TUPLE NOT FOUND
Default is RPT
TABLE IBNXLA:  XLANAME IBNXLA1
IBNXLA1 93 FEAT N N N NFAIMPL

+++ TRAVER:  SUCCESSFUL CALL TRACE +++

Feature NFAIMPL not supported by TRAVER

+++ TRAVER:  SUCCESSFUL CALL TRACE +++
```

### TRAVER for use of the AMBIG selector

The following TRAVER example shows the translations necessary to allow a RES line to dial a feature access code without using the \* prefix digit. This example shows use of the call forwarding programming (CFWP) feature.

---

## Network Facility Access (continued)

---

### SERVORD example for Network Facility Access for RES line with CFWP feature

```
>traver l 6210099 '72' b
TABLE IBNLINES
HOST 00 0 01 01 0 DP STN RES 6210099 0 $
TABLE LINEATTR
0 1FR NONE NT FR01 0 613 P621 L613 N TSPS N 10 NIL NILSFC
  LATA1 0 NIL NIL 00 Y RESGRP 0 9
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE NCOS
RESGRP 0 0 0 RNCOS3 ( XLAS RES1 RESXLA1 NDGT) $
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT
  AND DIGCOL
RESGRP NXLA RES1 RESXLA1 0 RES
TABLE DIGCOL
RES Specified: RES digit collection
TABLE IBNXLA: XLANAME RES1
RES1 72 AMBIG RESXLA1 3 RESXLA1
NUMBER OF DIGITS LESS THAN OR EQUAL TO 3 RESXLA1 TRANSLATOR
  WILL BE USED
TABLE IBNXLA: XLANAME RESXLA1
RESXLA1 72 FEAT N N N CFWP

+++ TRAVER: SUCCESSFUL CALL TRACE +++

SPEED CALL not supported by TRAVER

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

### **TRAVER for NFA for explicit access code**

This TRAVER example shows the translations necessary to set up an NFA explicit feature access code. This example is for a RES line.

---

**Network Facility Access** (continued)
 

---

**SERVORD example for Network Facility Access for explicit access code**

```

>traver l 6210099 'b72' b
TABLE IBNLINES
HOST 00 0 01 01 0 DP STN RES 6210099 0 $
TABLE LINEATTR
0 1FR NONE NT FR01 0 613 P621 L613 N TSPS N 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 0 0 0 RNCOS3 ( XLAS RES1 RESXLA1 NDGT) $
TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT
  AND DIGCOL
RESGRP NXLA RES1 RESXLA1 0 RES
TABLE DIGCOL
RES Specified: RES digit collection
TABLE IBNXLA: XLANAME RESXLA1
RESXLA1 72 FTR 2 NFAEXPL NFATG2 72
Invokes explicit access to NFA trunk

+++ TRAVER: SUCCESSFUL CALL TRACE +++

Feature NFAEXPL not supported by TRAVER

+++ TRAVER: SUCCESSFUL CALL TRACE +++

```

**SERVORD**

The data feature, Network Facility Access, is added for use on IBN or RES line class codes.

SERVORD is used to datafill tables IBNLINES and IBNFEAT.

IBNLINES (IBN Line Assignments) contains the line assignments for data channel links for the Bulk Calling Line Identification (BCLI) feature under the format name of BL.

IBNFEAT (IBN Line Feature) lists line features that are assigned to the IBN lines listed in table IBNLINES.

## Network Facility Access (continued)

### SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to Network Facility Access:

- NFA is not compatible with the AUL option.
- NFA can only be assigned to lines with a LCC of RES or IBN.

**Note:** If the RES\_SO\_SIMPLIFICATION office parameter is set to Y, this option can be added to 1FR and 1MR lines. This setting automatically changes the 1FR and 1MR LCC to RES LCC.

### SERVORD prompts

The following table shows the SERVORD prompts used to assign Network Facility Access to a line.

#### SERVORD prompts for Network Facility Access

Prompt	Valid input	Explanation
OPTION	NFA	Specifies the desired option.
USR_ID	1 to 10 digits	Specifies the user ID for a line having the NFA option added. The default is the seven-digit ANI of the line (NXX + XXXX).
IMPLCT_ ACC	Y or N	Tells whether or not the line is allowed implicit access. The default is Y.
IMPLCT_ SC	Vector of 1 to 5 values in range 0 to 9, * or #	Gives the implicit service code. It is only prompted for if IMPLCT_ACC is set to Y. The default is 0.
IMPLCT_ STAT	ACT, INACT	Tells whether or not the implicit access is active. It is only prompted for if IMPLCT_ACC is set to Y. The default is ACT.
EXPLCT_ A CC	Y or N	Tells whether or not the line is allowed explicit access. The default is Y.
AMA_ EXPLCT	Y or N	Controls the AMA record generation following an explicit connection. The default is N.
AMA_ IPDIAL	Y or N	Controls the AMA record generation following an IP-dialed call. The default is N.
REM_ACC	Y or N	Specifies whether the line is allowed remote access. Default is N.

---

## Network Facility Access (continued)

---

### SERVORD example service orders for adding Network Facility Access

The following SERVORD example shows how Network Facility Access is added to an existing line using the ADO command. The default user ID is used and implicit access is allowed. Explicit access is not allowed.

### SERVORD example for Network Facility Access in prompt mode using ADO for explicit access

```

SERVORD:
>ADO
SONUMBER:      NOW  91  6  5  PM
>$
DN_OR_LEN:
>9915001
OPTION:
>NFA
USER_ID:      9915001
>$
IMPLCT_ACC:   Y
>$
IMPLCT_SC:    0
>12345
IMPLCT_STAT:  ACT
>$
EXPLCT_ACC:   Y
>N
AMA_IPDIAL:   N
>Y
REM_ACC:      N
>N
OPTION:
>$

```

### SERVORD example for Network Facility Access in no-prompt mode using ADO for explicit access

```
>ADO $ 9915001 NFA $ $ 12345 $ N Y N $
```

The following SERVORD example shows how Network Facility Access is added to an existing line using the ADO command. A user ID is entered and explicit access is allowed. Implicit access is not allowed.

## Network Facility Access (continued)

---

### SERVORD example for Network Facility Access in prompt mode using ADO for explicit access

```
SERVORD:
>ADO
SONUMBER:    NOW  91  4  21  PM
>$
DN_OR_LEN:
>9915002
OPTION:
>NFA
USER_ID:    9915002
>111
IMPLCT_ACC: Y
>N
EXPLCT_ACC: Y
>$
AMA_EXPLCT: N
>$
AMA_IPDIAL: N
>$
REM_ACC:    N
>$
OPTION:
>$
```

### SERVORD example for Network Facility Access in no-prompt mode using ADO for explicit access

```
>ADO $ 9915002 NFA 111 N $ $ $ $ $
```

The following SERVORD example shows how the previous line, (991-5002, which was given explicit access) changes feature (CHF) to allow implicit access.

---

**Network Facility Access** (continued)
 

---

**SERVORD example for Network Facility Access in prompt mode using CHF to allow implicit access**

```

SERVORD:
>CHF
SONUMBER:    NOW  91  4 33  PM
>$
DN_OR_LEN:
>9915002
OPTION:
>NFA
USER_ID:    9915002
>111
IMPLCT_ACC: Y
>$
IMPLCT_SC:  0
>22
IMPLCT_STAT: ACT
>$
EXPLCT_ACC: Y
>$
AMA_EXPLCT: N
>$
AMA_IPDIAL: N
>Y
REM_ACC:    N
>$
OPTION:
>$
  
```

**SERVORD example for Network Facility Access in no-prompt mode using CHF to allow implicit access**

```
>CHF $ 9915002 NFA 111 $ 22 $ $ $ Y $ $
```

The following SERVORD example shows how Network Facility Access is added to an existing line using the ADO command. The line already has the WML option. Implicit access is not compatible with WML.

---

**Network Facility Access** (continued)

---

**SERVORD example for Network Facility Access in prompt mode using ADO to add NFA to an existing line with the WML option**

```
SERVORD:
>ADO
SONUMBER:    NOW  91  4  21  PM
>$
DN_OR_LEN:
>9915004
OPTION:
>NFA
USER_ID:    9915004
>$
IMPLCT_ACC: Y
>$
IMPLCT_SC:  0
>33
IMPLCT_STAT: ACT
>$
EXPLCT_ACC: Y
>$
AMA_EXPLCT: N
>Y
AMA_IPDIAL: N
>Y
REM_ACC:    N
>$
OPTION:
>$
```

**SERVORD example for Network Facility Access in no-prompt mode using ADO to add NFA to an existing line with the WML option**

```
>ADO $ 9915004 NFA $ $ 33 $ $ Y Y $ $
```



---

## Network Facility Access (continued)

---

**SERVORD example for Network Facility Access in prompt mode using ADO to add NFA to an existing line with the WML option (acceptance rejected)**

```

SERVORD:
>ADO
SONUMBER:    NOW  91  4  21  PM
>$
DN_OR_LEN:
>9915004
OPTION:
>NFA
USER_ID:    9915004
>$
IMPLCT_ACC: Y
>$
IMPLCT_SC:  0
>33
IMPLCT_STAT: ACT
>$
EXPLCT_ACC: Y
>$
AMA_EXPLCT: N
>Y
AMA_IPDIAL: N
>Y
REM_ACC:    N
>$
OPTION:
>$

```

**SERVORD example for Network Facility Access in no-prompt mode using ADO to add NFA to an existing line with the WML option (acceptance rejected)**

```
>ADO $ 9915004 NFA $ $ 33 $ $ Y Y $ $
```

The following SERVORD example shows how the Network Facility Access option is used to create an MDC line using the NEW command.

## Network Facility Access (continued)

---

**SERVORD example for Network Facility Access in prompt mode using NEW to create an MDC line**

```
SERVORD:
>NEW
SONUMBER:      NOW  91  6  5  PM
>$
DN_OR_LEN:
>6216677
LCC:
>IBN
GROUP:
>IBNTST
SUBGRP:
>0
NCOS:
>0
SNPA:
>919
LATANAME:
>LATA1
LTG:  0
>$
LEN_OR_LTID:
>HOST 00 0 09 03
OPTION:
>NFA
USER_ID:  6216677
>9196216677
IMPLCT_ACC:  Y
>$
IMPLCT_SC:  0
>12345
IMPLCT_STAT: ACT
>$
EXPLCT_ACC:  Y
>N
AMA_IPDIAL:  N
>Y
REM_ACC:  N
>$
OPTION:
>$
```

---

## Network Facility Access (end)

---

**SERVORD example for Network Facility Access in no-prompt mode using NEW to create an MDC line**

```
>NEW $ 6216677 IBN IBNTST 0 0 919 LATA1 $
HOST 00 0 09 03 NFA 9196216677 $ 12345 $ N Y $ $
```

The following SERVORD example shows how the Network Facility Access option is used to change the LCC of the previous line (621-6677) to 1FR, with RES\_SO\_SIMPLIFICATION field RES\_AS\_POTS set to Y, using the CHG command.

**SERVORD example for Network Facility Access in prompt mode using the CHG command to change LCC to 1FR**

```
SERVORD:
>CHG
SONUMBER:      NOW  91  6  5  PM
>$
WHAT:
>LINE
DN_OR_LEN:
>6216677
LINE_INFO:
>LCC
NEW_LCC:
>1FR
```

**SERVORD example for Network Facility Access in no-prompt mode using the CHG command to change LCC to 1FR**

```
>CHG $ LINE 6216677 LCC 1FR
```

## **NFA: Remote Access, Flash Processing**

---

### **Ordering codes**

Functional group ordering code: SAID0001

Functionality ordering code: Not applicable

### **Release applicability**

BCS35 and up

### **Prerequisites**

NFA: Remote Access, Flash Processing has no prerequisites.

### **Description**

The NFA: Remote Access, Flash Processing feature enhances the functionality of NFA by adding four new capabilities:

- The ability to access an NFA trunk from other locations in addition to the subscribers base telephone line
- The ability to place a connection to an NFA trunk on hold whenever the subscriber flashes from his or her line
- The ability to extend dial pulse (DP) to DTMF conversion through the entire life of a call dialed by an IP
- The introduction of an extra inverted wink into the NFA trunk signaling protocol

#### **Remote access to an NFA trunk**

A remote connection to an NFA trunk can be initiated by placing a call to a number which has been established for direct inward system access (DISA). If the network facility remote access (NFRA) option has been assigned to the DISA directory number (DN) and is activated, the subscriber is prompted to enter his or her home telephone number followed by a personal identification number (PIN). If the subscriber has been authorized for remote access to an NFA trunk, a remote connection is established using the NFA trunk by outputting the remote access service code datafilled for the customer group along with the subscribers user ID. The originator then has access to the IP functionality which is compatible with a remote access, such as having the IP place a call to a routing DN for the subscriber.

#### **Flash processing enhancements**

The second area of development for this feature enhances the NFA trunk signaling protocol to allow an explicit or remote NFA trunk connection to be placed on hold. If the subscribers line has been assigned flash capability, the subscriber can place an explicit NFA trunk connection on hold or remove it

---

## **NFA: Remote Access, Flash Processing** (continued)

---

from hold by entering a flash from the telephone set. The flash is propagated on the NFA trunk to the IP whenever this is done.

In addition, the NFA flash processing enhancements also provide for an implicit NFA connection to the IP following a flash from the subscribers line. This implicit access can be used to dial either a directory number or a feature access code for the subscriber. The implicit access is provided in situations where the subscriber is required to dial digits from his or her telephone line.

### **Extended DP to DTMF conversion**

Base DP to DTMF conversion was designed by NFA in BCS34 to convert dial pulses from the subscribers DP telephone set to DTMF tones before propagating them over an NFA trunk. However, this capability was only in effect while the NFA trunk was connected to the call. The third part of this feature implements a new form of DP to DTMF conversion called extended conversion. This form of conversion is available only for explicit NFA trunk connections which are initiated by entering an explicit NFA feature activation code that has been assigned the extended conversion option. Whenever extended conversion is activated on an explicit connection to an NFA trunk, it remains in effect throughout both the explicit connection and any call that the IP might dial for the subscriber.

### **Inverted wink protocol change**

The fourth part of this feature involves adding an inverted wink to the NFA trunk signaling protocol. This inverted wink is sent on the NFA trunk from the DMS switch to the IP as soon as cut-through has occurred in order to give the IP a positive indication that it can begin interacting with the subscriber. The inverted wink is incorporated into the protocol for explicit, implicit, and remote NFA trunk connections.

## **Operation**

A description of how NFA: Remote Access, Flash Processing works is detailed in the following information.

## NFA: Remote Access, Flash Processing (continued)

### NFA Remote Access

Switch provides:

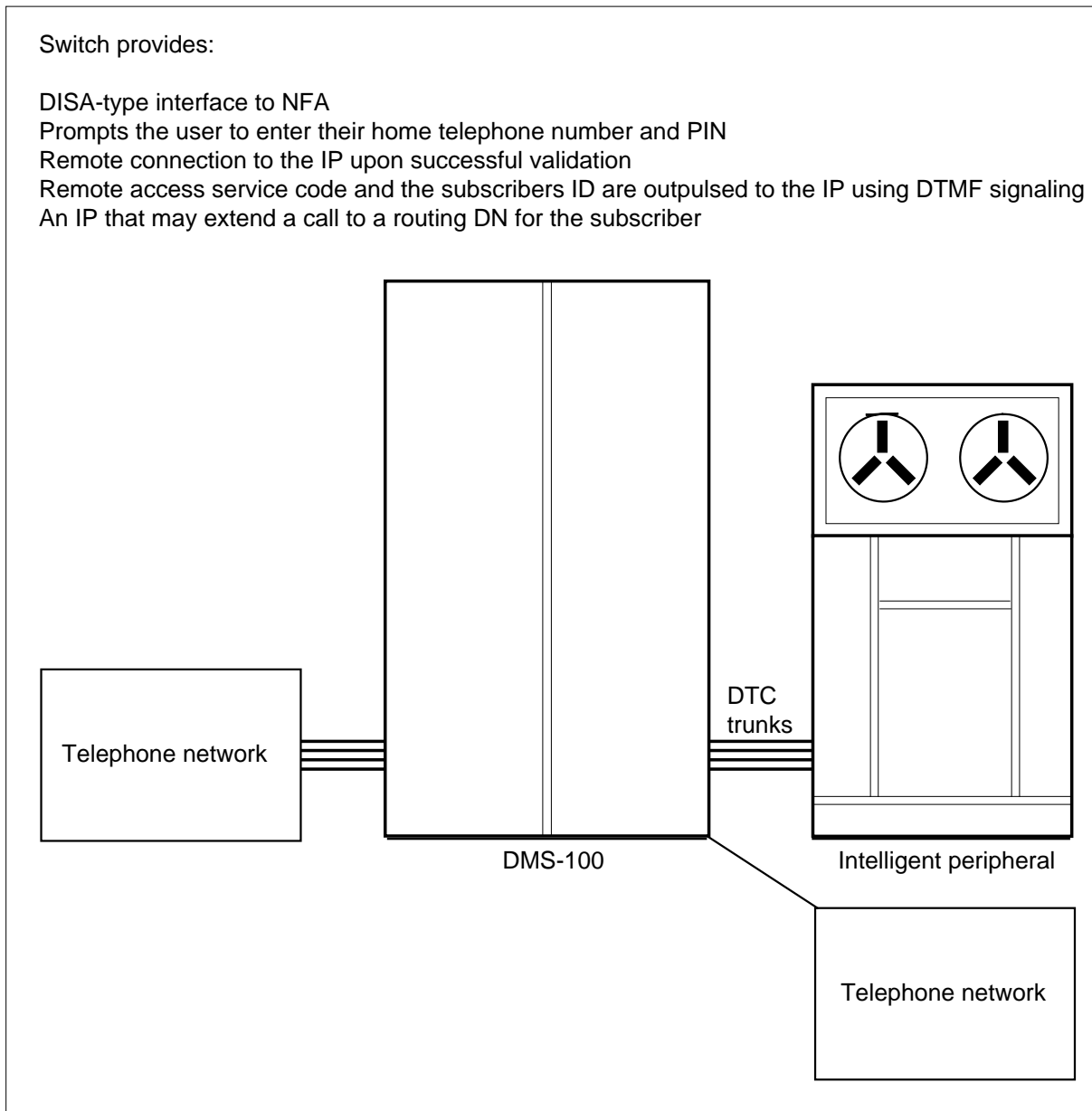
DISA-type interface to NFA

Prompts the user to enter their home telephone number and PIN

Remote connection to the IP upon successful validation

Remote access service code and the subscribers ID are outputted to the IP using DTMF signaling

An IP that may extend a call to a routing DN for the subscriber



---

## NFA: Remote Access, Flash Processing (continued)

---

### Remote access to an NFA trunk

An NFA subscriber who has been assigned remote access capabilities can use the following process to initiate a remote connection to an NFA trunk.

1. The subscriber begins a remote session by dialing a DISA DN which has been assigned the NFRA DISA option. When the call terminates to this DN, one of the following occurs:
  - a. If NFRA is the only remote DISA feature assigned to the DISA DN, the feature is activated automatically. The subscriber proceeds to step 2.
  - b. If more than one remote DISA feature has been assigned to the DISA DN, the subscriber is prompted by a digital recorded announcement machine (DRAM) announcement to enter the access code of the feature they want to activate. To activate NFRA, the subscriber must enter the NFRA access code, which has been datafilled in table IBNXLA. The NFRA access code is translated using the customer group, subgroup, and network class of service (NCOS) specified for the DISA DN.
2. The subscriber is prompted by a DRAM announcement to enter the subscribers home telephone number followed by the PIN. The subscriber is given one attempt to enter a valid telephone number and PIN combination as a single digit stream. The end of dialing is indicated either by an octothorpe number or by the expiration of inter-digital timeout.

The customer group, subgroup, and NCOS specified for the DISA DN are used to translate the telephone number entered by the subscriber in order to determine if NFRA has been assigned to that line. The number of digits required for this translation must be specified in the CUSTSTN tuple for the customer group. If a valid telephone number and PIN are not entered, the call is routed to treatment. If the DRAM announcement is not properly datafilled or if an announcement channel is not available, the call is sent to treatment.

Remote access to an NFA trunk can only be activated by a subscriber who has specified a unique DN. If the DN entered by the subscriber translates to a distributed line hunt (DLH) or multiline hunt (MLH) group, then remote access capability must be assigned to the pilot of the group and the subscriber must enter the PIN that is datafilled for the pilot. The subscriber is not allowed to dial any number that translates to a non-unique DN, such as a multiple appearance directory number (MADN) group DN.

The subscriber is unable to enter a flash from the telephone set while connected to the DRAM announcement. If the line has been assigned

## **NFA: Remote Access, Flash Processing** (continued)

---

flash capabilities, a flash can be entered as soon as an octothorpe has been entered or inter-digital timeout has expired.

3. If a valid telephone number and PIN combination are entered, the DMS switch attempts to establish a remote connection between the subscriber and an NFA trunk. This connection is accomplished using the same messaging protocol that is used for NFA explicit connections. First, the DMS switch seizes an idle member from the trunk group specified in the customer groups CUSTSTN tuple along with the subscribers ID and waits for the call to be answered.

If NFA trunk resources are not available to connect the subscriber to an NFA trunk, the call receives the same treatment as specified in the protocol for a regular explicit connection.

4. The IP sends answer supervision back on the NFA trunk to the DMS switch and the connection is completed. If the IP fails to answer within the specified time datafilled in the trunks group data, the trunk connection is dropped and the subscriber is sent to treatment. If the subscriber goes on-hook at any point during this process, the DMS switch disconnects the NFA trunk and takes down the call. As soon as cut-through occurs, an inverted wink is sent by the DMS switch on the NFA trunk.
5. At this point, a stable call is established between the remote subscriber and the IP. No DP to DTMF conversion is provided. The call between the remote subscriber and the NFA trunk remains in place until one of the following events occur:
  - a. The subscriber flashes. This can occur if the line being used by the subscriber has been assigned flash capability. If the subscriber flashes and the line being used is on the same switch as the DISA DN, the flash is handled as specified in the "Flash processing enhancements" section. If the subscribers line is on a different switch in the network, the terminating switch with the DISA DN is not aware of the action, since the flash is not propagated through the network. The connection between the NFA trunk from the terminating office and the IP remains in place.
  - b. The subscriber goes on-hook. If this occurs, the call is disconnected. An automatic message accounting (AMA) record can be generated, if datafilled, to record the remote connection that was established between the subscriber and the NFA trunk.
  - c. The IP goes on-hook. If this occurs, the leg of the call between the subscriber and the NFA trunk is disconnected. An AMA record can



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## NFA: Remote Access, Flash Processing (continued)

---

be generated, if datafilled, to record the remote connection that was established between the subscriber and the NFA trunk.

- d. The IP returns an inverted wink. This indicates that the IP intends to dial a routing number for the subscriber. At this point, the DMS switch receives digits from the IP as specified in the existing protocol for IP dialing. Once the end of digits indication is received, the NFA trunk connection to the IP is disconnected and an AMA record can be generated, if datafilled, to record the remote connection that was established between the subscriber and the IP.

If the digits transmitted by the IP are received properly, the DMS switch translates them using the customer's dialing plan to determine whether or not the IP has attempted to dial a feature access code. If the digits indicate a feature access code, then the DMS switch sends the call to FEATURE\_NOT\_ALLOWED (FNAL) treatment. If the digits can translate to a regular line or trunk connection, then the DMS switch attempts to place the call as if the subscriber had dialed the digits from the subscribers home telephone line.

As soon as the digits received from the IP are dialed, the subscriber is removed from hold and reconnected to the call. One of the following events occurs:

- The call terminates to some type of treatment (busy, reorder, etc.). The subscriber is sent to the specified treatment.
- The call terminates but is never answered. The subscriber receives ringing and is required to go on-hook before further actions can be taken.
- The call terminates and is answered. A stable call is established between the remote NFA user and the called party. This call remains up until one or the other of these parties goes on-hook. When this occurs, this leg of the call is disconnected.

### Flash processing enhancements

Flash processing enhancements are discussed in the following section.

#### NFA trunk on hold

NFRA enhances the protocol to allow a subscriber flash to be propagated on the NFA trunk to the IP while it is connected to the call. This functionality allows the user to place either an explicit or remote NFA trunk connection on hold while activating another feature such as call waiting (CWT) or three-way calling (3WC). While the IP is on hold, the DMS switch does not recognize any signaling from the IP on the NFA trunk other than an on-hook signal.

A subscriber can place an NFA trunk connection on hold if assigned flash capabilities and if involved in either an explicit NFA connection or a remote

## **NFA: Remote Access, Flash Processing** (continued)

---

NFA connection from a line on the same switch as the subscribers home telephone line. If these requirements are met, the subscriber may enter a flash from the telephone set in order to activate another feature. One of the following actions can take place:

- If the flash places the NFA trunk connection on hold, then the flash is propagated to the IP according to LSSGR standards. This functionality can occur if the subscriber is connected to the IP and flashes to initiate the second leg of a three-way call. While the NFA trunk connection is on hold, the DMS switch ignores any inverted winks that are received on the trunk. The only signaling that the DMS switch recognizes from the NFA trunk is an on-hook signal. If an on-hook signal is received, the NFA trunk is idled and that leg of the call is disconnected. An AMA record can be generated, if datafilled, to record the connection to the NFA trunk.

If the NFA trunk connection is a remote access to a different office other than the one that serves the originator, then a flash is not propagated on the NFA trunk to the IP. This functionality is because the flash from the originating office is not propagated through the network to the NFA office. In this scenario, the NFA trunk is not aware that the originator has placed it on hold.

- If the flash removes the NFA trunk connection from hold, then the trunk is reconnected to the call. This functionality can occur if the subscriber has placed the NFA trunk on hold in order for CWT to be activated and now wishes to reconnect to the first call leg with the IP. If the flash removes the NFA trunk from hold, the flash is propagated on the NFA trunk to the IP.

If the NFA trunk connection is a remote access to a different office other than the one that serves the originator, then a flash is not propagated on the NFA trunk to the IP. This functionality is because the flash from the originating office is not propagated through the network to the NFA office. In this scenario, the NFA trunk is not aware that the originator has placed it on hold.

- If the flash drops the connection to the NFA trunk, then the leg of the call with the NFA trunk is disconnected. This functionality can occur if the subscriber has an active three-way call in progress with the NFA trunk on the second leg and flashes to disconnect the second leg. When this occurs, an on-hook signal is sent on the NFA trunk to the IP. An AMA record can be generated, if datafilled, to record the connection to the NFA trunk.
- If the flash does not alter the state of the NFA trunk connection, then it is not propagated on the NFA trunk to the IP. This functionality can occur if the subscriber has just initiated an explicit connection to an NFA trunk on the second leg of a three-way call. The next flash entered by the subscriber conferences the first and second legs together. However, the second leg of

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## NFA: Remote Access, Flash Processing (continued)

---

the call is not put on hold as a result of this action, and a flash is not propagated on the NFA trunk to the IP.

### Implicit access on the second leg of 3WC

This feature provides the ability to access the NFA trunk on the second leg of a three-way call. Previously, only explicit access was allowed on the second leg.

After a flash to initiate the second leg of a three-way call, a subscriber with active implicit access is implicitly connected to the NFA trunk. The normal implicit access protocol applies in this scenario, which includes the ability for the trunk to dial a call for the subscriber. The following two differences exist between implicit functionality on the first leg of a call and implicit functionality on the second leg:

- Since stuttered dial tone is never supplied on the second leg of a three-way call, the aspects of the implicit protocol concerning stuttered dial tone do not apply (for example, no stuttered dial tone service code).
- If an implicit connection on the second leg of a call is not answered before the subscriber dials digits, recall dial tone is returned to the subscriber. This functionality also occurs if an answered implicit connection on the second leg disconnects before the NFA trunk dials digits. In either case, the ROH timer is reset for the subscriber.

The functionality of the following features is supported by NFA implicit following a flash entered by the subscriber. This functionality is subject to the existing flash handling capabilities of each individual feature.

- Account Code feature

A subscriber with Account Code feature (ACCT) can flash to enter the account code feature activation code followed by the subscribers account code. The resulting implicit connection from the flash is used to dial the account code feature activation code. Upon receiving recall dial tone, the subscriber must then dial the account code.

- Authorization Code feature

When a subscriber with Authorization Code feature (AUTH) enters a flash, the authorization code feature's activation code is entered followed by the authorization code. After the code is verified, the subscriber dials the DN of the party for the second leg of the call. The implicit access that results is used to dial the authorization code feature's activation code. Upon receiving recall dial tone, the subscriber must then dial the authorization code and the DN of the party for the second leg.

The AUTH and ACCT features can be configured so that an account code must be entered following the authorization code. In this scenario, the

## **NFA: Remote Access, Flash Processing** (continued)

---

subscriber enters the authorization code feature's activation code following the flash. At this point, recall dial tone is received and the subscriber enters the authorization code and the account code. Once this is verified, the subscriber dials the DN of the party for the second leg of the call. The implicit access that results from the flash can be used to dial the authorization code feature's activation code. Upon receiving recall dial tone, the subscriber must then dial the authorization code, account code, and the DN of the party for the second leg.

- Automatic Call Back (ACB) feature

If the subscriber dials a party that is busy, he or she may flash to dial the ACB activation code. The implicit connection that results from the flash can be used to dial the ACB feature activation code.

- Speed Call (SC) feature

When a subscriber with the Speed Call feature enters a flash, a cell identifier can be entered that will cause the digits programmed in the speed call cell to be dialed. The implicit access that results from the flash can be used to dial the speed call cell identifier.

- Call Hold (CHD)
- Call Pickup (CPU)
- Call Request Activation (Message Waiting) (CRA)
- Call Transfer (CXR)
- Call Waiting Origination (CWO)
- Cancel Call Waiting (CCW)
- Executive Busy Override (EBO)
- Group Intercom (GIC)
- Last Number Redial (LNR)
- Meet-me Conference (MMC)
- Pre-set Conference (PSC)
- Ring Again (RAG)
- Station Controlled Conference (SCC)
- Three-way Calling (3WC)

The functionality of the following features is not supported following a flash. Therefore, the functionality is also not supported by implicit access following

---

## NFA: Remote Access, Flash Processing (continued)

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a flash. If an attempt is made to enter any of the following feature activation codes, the call routes to treatment.

- Call Forwarding (CFW)
- Customer Originated Trace (COT)
- Call Request Retrieve (Message Waiting ) (CRR)
- Directed Call Pickup with Barge-in (DCBI)
- Directed Call Pickup—non Barge-in (DCPU)
- Speed Call Programming (SC)
- Automatic Redial (AR)

The following features only apply to call terminations; therefore, they are not applicable to NFA implicit activation following a flash:

- Calling Name Delivery (CNAMD)
- Calling Number Delivery (CND)
- Call Waiting (CWT)

### Conferencing with explicit access on second leg of 3WC

In the BCS34 version of NFA, if the subscriber dialed an explicit access to the NFA trunk on the second leg of a three-way call and wished to flash to conference back to the first party, the subscriber had to wait until the NFA trunk returned answer supervision before doing so. This feature provides functionality that allows the subscriber to flash and conference the first party back into the call immediately after the NFA trunk has been seized.

*Note:* This functionality only applies if the first party is not an NFA trunk, because a single subscriber may not conference two NFA connections together.

### Extended DP to DTMF conversion

This feature implements a new type of DP to DTMF conversion called extended conversion which coexists with the existing implementation of DP to DTMF conversion, referred to as base conversion. The primary advantage of extended conversion is that it remains active not only while the subscriber is connected to the NFA trunk, but also during any call the IP might extend for the subscriber. With base conversion, the DP to DTMF conversion is only active while the subscriber is connected to the NFA trunk.

A new subfield is added to each NFA explicit access code tuple in table IBNXL A that specifies whether or not extended conversion is to take place. If this field is set to Y, then extended conversion will occur on all NFA calls

## NFA: Remote Access, Flash Processing (continued)

initiated by dialing that explicit access code. If this subfield is set to N, then the existing implementation of DP to DTMF conversion applies during explicit NFA connections initiated with that access code.

**Note:** Neither form of DP to DTMF conversion applies to implicit or remote NFA connections.

The following figure shows a tuple from table IBNXLA for an NFA explicit access code with extended conversion activated.

### Datafill example for table IBNXLA

*Example of a MAP display*

KEY						RESULT
-----						
IBNXLA1	78	FTR	2	NFAEXPL	TRKGP1	54321 Y

If the EXT\_CONV subfield is set to Y, then the subscriber hears the tone that is generated by the DP dialing. The tone begins as soon as the connection to the NFA trunk is established and continues while the NFA trunk is involved in the call as well as during any call that is extended for the subscriber.

The tone is generated following each DP digit after it has been outpulsed. This tone is both audible and recognizable to any parties that may be conferenced to the call. If the subscriber dials an explicit access code which has been assigned extended conversion, then extended conversion starts as soon as answer is received on the NFA trunk. If that subscriber then flashes to place the NFA trunk connection on hold and initiates a three-way call, then extended conversion continues to take place on the second leg of the three-way call.

If the EXT\_CONV subfield is set to N, then the subscriber does not hear the tone that is generated by the DP dialing. This functionality is provided by base conversion in BCS34.

In instances where an explicit NFA connection extends a call to another explicit NFA connection, the type of DP to DTMF conversion in effect depends on the datafill for the table IBNXLA explicit access code used in the most recent access. For example, if line A dials an explicit access code with EXT\_CONV set to Y, then extended DP to DTMF conversion is initiated. If the NFA trunk then dials a different explicit access code for the subscriber that has EXT\_CONV set to N, then extended DP to DTMF conversion ceases and regular DP to DTMF conversion is initiated.

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## NFA: Remote Access, Flash Processing (continued)

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Once extended conversion is initiated, it remains in effect until it is either deactivated by an additional explicit access (with EXT\_CONV set to N as described in the preceding paragraph) or until the subscriber disconnects from the call. This functionality implies that extended conversion is in effect during calls extended by the IP as well as other call legs that are initiated. If extended conversion is activated for a subscriber and they access a feature requiring further digit collection, DP digits are echoed by their DTMF equivalents, possibly resulting in double digit dialing.

As previously mentioned, if an explicit connection using extended conversion is put on hold by a user flash, extended conversion continues on the second call leg. If that call leg then activates an explicit connection that uses normal conversion (feature NC0418), the extended conversion ends. If the user then flashes again, thus dropping the normal connection and removing the extended connection from hold, extended conversion resumes.

**Note:** Extended conversion is only resumed in this manner if an explicit connection to the NFA trunk is being brought off from hold. If an extended call to some other agent is being brought off from hold, extended conversion (if previously stopped) will not be restarted.

The NFA line itself may be put on hold while extended conversion is in progress, either due to another lines flashing (in a 3WC scenario, for example), or due to the trunk extending a call for the line. At such time, if the subscriber enters a DP digit, they hear the converted tone, but it is not transmitted to any other agent.

If DP to DTMF conversion takes place while the subscriber is connected by an explicit connection to an NFA trunk, the AMA record that is generated for the connection has its CONV REQ field set to two. This functionality indicates that DP to DTMF conversion was performed during the explicit connection. If DP to DTMF conversion does not occur while the explicit connection to the NFA trunk is in place, then the CONV REQ field in the AMA record is set to one, even if conversion is performed later during the call extension.

### **Inverted wink protocol change**

This feature incorporates an extra inverted wink into the trunk signaling protocol that is used in implicit, explicit, and remote NFA connections. This extra inverted wink is delivered to the IP on the NFA trunk after the IP has answered the call and cut-through has occurred. The duration of the inverted wink is approximately 100 ms, depending on the switch load at the time.

### **Customized announcements**

NFRA uses a recorded DRAM announcement to prompt for the subscribers home telephone number and PIN. This DRAM announcement is required and

## NFA: Remote Access, Flash Processing (continued)

---

must be custom recorded by the operating company. In addition, a recorded announcement that prompts for a remote DISA feature access code is required if more than one remote DISA feature is assigned to a DISA DN.

Customized announcements are recorded on an NT1X77 random access memory (RAM) or NT1X79 electrically erasable programmable read-only memory (EEPROM) card using the DRAMREC utility. The phrases are then datafilled in table DRMUSERS in the same way as prerecorded announcements.

The following announcement text is suggested:

1. *Please enter a code to remotely access a feature.*

This interruptible announcement is provided by the DISA feature to allow a common remote access interface for all remote access features. If the DISA DN is dedicated to one remote access feature, this announcement is not given.

**Note:** An interruptible announcement replaces dial tone. Thus, digits are accepted at any point during the announcement text.

This announcement is datafilled as a standard announcement in tables ANNS, ANNMEMS, DRAMTRK, and CUSTHEAD.

2. *Please enter your x digit telephone number, followed by your PIN number.*

This interruptible announcement is specific to NFRA. It is composed of phrases that form the announcement. This announcement plays once and allows the subscriber one opportunity to enter a valid combination of home telephone number and PIN.

The following tables must be datafilled in order to use these announcements.

### Table CLLI

The CLLI names for the DISA and NFRA announcements are defined in this table. The TRKGRPSIZ field indicates the maximum number of simultaneous users of the announcement and should be set depending on the office engineering for DRAM announcements. In this example, a value of 15 was selected arbitrarily.



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**NFA: Remote Access, Flash Processing** (continued)

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**MAP display for table CLLI**

CLLI	ADNUM	TRKGRSIZ	ADMININF
DISARAC	353	15	DISA_ANNOUNCEMENT
NFRAANN	354	15	NFRA_ANNOUNCEMENT

**Table ANNS**

The DISA announcement is a standard announcement and should be datafilled as announcement type STND (standard). The NFRA announcement should be defined as announcement type NFRA. The MAXCONN field specifies how many callers can hear the announcement at a time. The CYTIME field indicates the length of each announcement cycle or is set to 0 for flexible announcements datafilled in DRMUSERS. The MAXCYC field indicates the number of times the announcement plays during each cycle.

**MAP display for table ANNS**

CLLI	ANTYPE	TRAFSNO	MAXCONN	CYTIME	MAXCYC
NFRAANN	NFRA	23	15	0	1
DISARAC	STND	23	15	12	1

**Table ANNMEMS**

The announcement channels are defined for use. NFRA uses unilingual announcements, so one track is sufficient. Each announcement must have a tuple for each announcement trunk member.

*Note:* The phrase content of the DISA announcement is defined in table DRAMTRK. The phrase content of the NFRA announcement is defined in table DRMUSERS.

## NFA: Remote Access, Flash Processing (continued)

### MAP display for table ANNMEMS

ANNMEM		HDWTYPE	CARD	MEMINFO
DISARAC	0	DRAM	DRA	(0 MTM 1 5)\$
DISARAC	14	DRAM	DRA	(0 MTM 1 19)\$
NFRAANN	0	DRAM	DRA	(0 MTM 2 15)\$
NFRAANN	14	DRAM	DRA	(0 MTM 2 29)\$

### Table DRAMS

The DRAM memory cards that store the announcement phrases are specified in this table. The table is arranged with each NT1X75BA DRAM controller card followed by the one to eight memory cards that it controls. The NT1X75BA controller card should be used for the DRAM when custom recorded announcements are used. The controller and all of its memory cards must be on the same MTM shelf. The following example shows use of the NT1X79AA EEPROM DRAM memory card.

Switch settings on the DRAM memory cards indicate the DRAM virtual card number to the DRAM controller card. The TMCKT field in table DRAMS is the DRAM virtual card number.

### MAP display for table DRAMS

DRAMCARD	TMTYPE	TMNO	TMCKT	CARDCODE	CARDINFO
0	MTM	1	0	1X75BA	CTLR DRAM0\$
1	MTM	1	2	1X79AA	EEPROM (0)\$

The DRAMREC command ASSIGNDUMP determines the DRAM commands used to reassign PROM phrases after DMS-100 switch image booting. These commands can then be added to the profile executed by the operator during system initialization.

The operating company should record the NFRA announcement phrases using the DRAMREC facility. See the *Digital Recorded Announcement Machine Maintenance Reference Manual, 297-1001-527*, for further information about the DRAMREC facility.

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## NFA: Remote Access, Flash Processing (continued)

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The following phrases are required for this feature. The exact wording can be modified at the discretion of the operating company. The phrase "SILENCE" is required to internally pad each announcement. This phrase can be as short as 1 s. The phrases "NFRAEDNPIN1" and "NFRAEDNPIN2" must be recorded in order for this feature to function. The digit phrases are required if the number of digits in the home telephone number is to be included in the message.

**SILENCE**

1 s of silence

**NFRAEDNPIN1**

"Please enter your"

**NFRAEDNPIN2**

"telephone number followed by your PIN number"

**NFRAEONEDIGIT**

"one digit"

**NFRAETWODIGIT**

"two digit"

**NFRAETHREEDIGIT**

"three digit"

**NFRAEFOURDIGIT**

"four digit"

**NFRAEFIVEDIGIT**

"five digit"

**NFRAESIXDIGIT**

"six digit"

**NFRAESEVENDIGIT**

"seven digit"

**NFRAEEIGHTDIGIT**

"eight digit"

**NFRANINEDIGIT**

"nine digit"

**NFRAETENDIGIT**

"ten digit"

**Table DRMUSERS**

This table indicates the phrase list that is used to construct the NFRA announcement. Phrases NFRAEDNPIN1 and NFRAEDNPIN2 correspond to the phrases recorded using the DRAMREC facility. Phrase NFRAEDIGITS will correspond to the phrase "X digit", where X is specified by the NUMDIGS

## NFA: Remote Access, Flash Processing (continued)

field in the NFRA tuple for the customer group in table CUSTSTN. If the operating company does not wish to provide the number of digits required to dial the base station, the phrase NFRAEDIGITS may be omitted.

### MAP display for table DRMUSERS

USERANN	PHSLIST
-----	-----
NFRAANN      1      (NFRAEDNPIN1)	(NFRAEDIGITS) (NFRAEDNPIN2) \$

### Table DRAMTRK

This table indicates the phrase that is used for a standard announcement. A tuple is only required in this table if the DISA announcement that prompts for a feature access code is required. This example assumes that the phrase DISAPHRASE has been recorded.

### MAP display for table DRAMTRK

ANNTRACK	PHSLIST
-----	-----
DISARAC    0	DISAPHRASE \$

## Translations table flow

The NFA: Remote Access, Flash Processing translations tables are described in the following list:

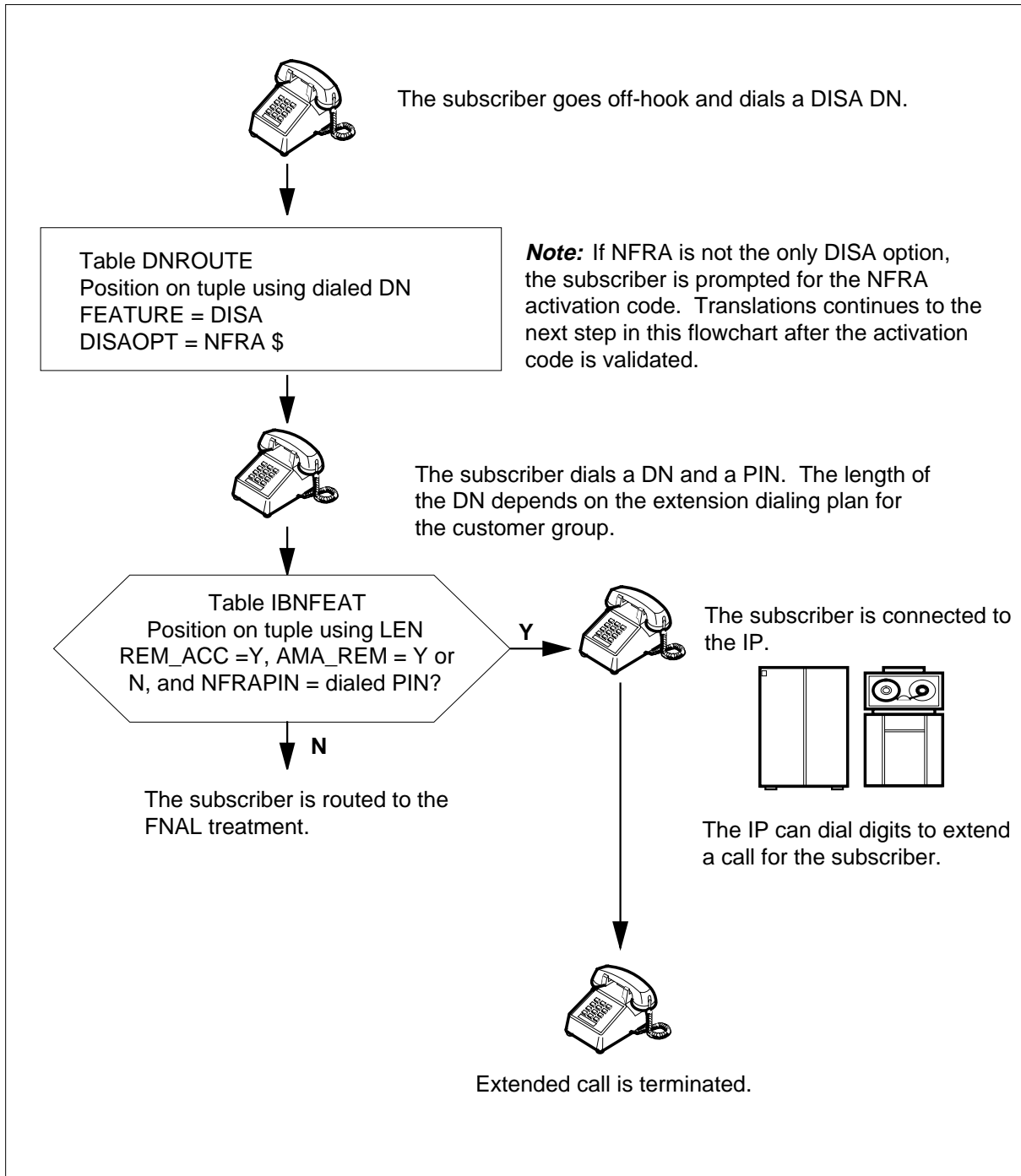
- Table DNROUTE - lists information for writable DNs in the switch, such as a DN that identifies a route instead of a line equipment number (LEN). The DISA DN used in the flowchart that follows is defined in table DNROUTE. NFRA must be assigned to the DN.
- Table IBNFEAT - lists the features assigned to a LEN.
- Table CUSTSTN - contains the station options assigned to a customer group. Datafill in this table determines the number of digits that can be entered for the subscribers DN, the name of the remote trunk group, and the remote service code.

The NFA: Remote Access, Flash Processing translation process is shown in the flowchart that follows. The flowchart shows the table flow for programming

**NFA: Remote Access, Flash Processing** (continued)

NFA from a remote set. In this example, the IP is used to extend a call for the subscriber.

**Table flow for NFA: Remote Access, Flash Processing**



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## NFA: Remote Access, Flash Processing (continued)

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The following table lists the datafill content used in the flowchart.

### Datafill example for NFA: Remote Access, Flash Processing

Item	Example data
DISA DN	621-1000
LEN of subscriber	HOST 00 02 0 05
Datafill table	Example data
DNROUTE	613 621 1000 FEAT DISA RESGRP 0 N N N Y (NFRA) (NCOSOPT 0) \$
IBNFEAT	HOST 00 0 09 07 0 NFA NFA 6211233 Y 33 INACT Y N N Y Y 654321 \$
CUSTSTN	IBNTST NFRA NFRA NFRATKGP 9999 7

### Limitations and restrictions

The following limitations and restrictions apply to NFA: Remote Access, Flash Processing:

- remote access to an NFA trunk
  - The IP is only allowed to dial routing DNs for a subscriber that has accessed the IP using a remote connection. The IP is not allowed to dial any feature activation codes for a remote originator, including speed call activations and IBNXLA features.
  - The remote subscriber must enter a DN that uniquely identifies the line. A remote subscriber cannot access a PIN stored for a member of a MADN group. A remote subscriber cannot access a PIN stored for a member of a DLH or MLH group. The subscriber must enter the PIN assigned to the pilot of these hunt groups in order to initiate a remote connection.
- NFA flash processing
  - The subscriber can flash and place an explicit or remote NFA trunk connection on hold if the trunk connection has been answered by the IP.
  - A single subscriber is not allowed to conference together more than one connection to an NFA trunk. If an attempt is made, the second NFA trunk connection is dropped.
- DP to DTMF conversion
  - The DP conversion process, whether normal or extended conversion, does not survive over an XMS-based peripheral module (XPM) warm switch of activity (SWACT). An established call will survive, but

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**NFA: Remote Access, Flash Processing** (continued)

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attempts by the subscriber to dial a dial pulse digit will not result in a DTMF tone.

**Interactions**

The following paragraphs describe the interactions between NFA: Remote Access, Flash Processing and other functionalities.

**Three-way calling and explicit NFA connections**

Whenever an explicit NFA connection attempts to extend a call for the subscriber while it is involved in a three-way call, the new party, being the last to join the conference, is added on the second leg of the three-way call. The other party in the three-way call is then placed on the first leg.

For example, party A establishes a three-way call with an NFA explicit trunk connection on the first leg and party B on the second leg. When the NFA trunk indicates that it intends to extend a call, party B is transferred to the first leg of the call and placed on hold while the DMS switch extends the call to party C on the second leg. Party A is now connected to a two-party call with party C. When party A flashes again, a three-way call is formed with party B on the first leg and party C on the second leg. If party A flashes again at this point, party C is dropped from the call and a two-way call is reestablished between A and B (according to existing three-way call functionality).

As another example, party A establishes a three-way call with party B on the first leg and an NFA explicit trunk connection on the second leg. When the NFA trunk indicates that it intends to extend a call, party B is placed on hold while the DMS switch extends the call to party C on the second leg. Party A is now connected to a two-party call with party C. When party A flashes again, a three-party call is formed with party B on the first leg and party C on the second leg. If party A flashes again at this point, party C is dropped from the call and a two-way call is reestablished between A and B (according to existing three-way call functionality).

**Three-way calling and remote NFA connections**

NFRA is allowed on either leg of a three-way call. Whenever a remote NFA connection attempts to extend a call for the subscriber while it is involved in a three-way call, the new party replaces the NFA remote connection on whichever leg of the call in which it was involved. The state of the three-way call and the state of the other party's connection is not changed. This provides a consistent interface on remote NFA connections, where the connection is established from the local office or from a remote office.

For example, party A establishes a three-way call with a remote NFA trunk connection on the first leg and party B on the second leg. When the NFA trunk

## **NFA: Remote Access, Flash Processing** (continued)

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indicates that it intends to extend a call to party C, party C is placed on the first leg of the three-way call, and audible ringing is heard by both parties A and B. The state of the call remains as a three-way conference. Therefore, party A does not need to enter a flash in order to reform the conference. If party A does flash at this point, party B is dropped from the second leg of the call and a two-way call is reestablished between A and C (according to existing three-way call functionality). This functionality is the same regardless of whether the remote NFA connection is in the same office as party A or in a different office.

As another example, party A establishes a three-way call with party B on the first leg and a remote NFA trunk connection on the second leg. When the NFA trunk indicates that it intends to extend a call to party C, party C is placed on the second leg of the three-way call and audible ringing is heard by both parties A and B. The state of the call remains as a three-way conference, so party A does not need to enter a flash in order to reform the conference. If party A does flash at this point, party C is dropped from the second leg of the call, and a two-way call is reestablished between A and B (according to existing three-way call functionality). This functionality is the same regardless of whether the remote NFA connection is in the same office as party A or in a different office.

### **Flash restrictions**

The flash processing capability of NFA allows NFA trunk connections to the IP to be placed on hold. This capability provides a consistent interface for any features that cause a party involved in the call to be placed on hold. However, whenever an NFA trunk has been placed on hold, the DMS switch ignores all signaling received from the NFA trunk except for an on-hook.

### **Three-way calling**

A single subscriber is not allowed to conference two NFA trunk connections together. If an attempt is made, the second NFA trunk connection is dropped.

The subscriber is not allowed to transfer a connection to an NFA trunk to another party.

It is possible to establish a call that includes two NFA trunk connections through the use of call chaining. For example, if party A and party B both have NFA and three-way calling, it is possible for party A to call party B. This connection can be followed by both parties A and B adding an explicit NFA connection to their respective second call legs. When A and B are conferenced together, the call chain will include two NFA trunk connections.

It is also possible to establish a call that includes two NFA trunk connections, if either of the connections is a remote access to an NFA trunk in another



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## NFA: Remote Access, Flash Processing (continued)

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office. For example, party A dials an explicit NFA connection and flashes to place the connection on hold. Then, party A dials an NFRA DISA number in another office, enters a valid DN and PIN combination to establish a remote connection, and at this point, flashes to form a three-way call between the two trunk connections.

### Call Transfer

The subscriber is not allowed to transfer a connection to an NFA trunk to another party. This restriction applies to explicit NFA connections and to remote NFA connections in the same office as the subscriber. It is possible to transfer a remote NFA connection to a different office from the originator. For example, party A forms a three-way call between party B and a remote NFA connection in a different office.

*Note:* The remote NFA connection was established by dialing an NFRA DISA DN associated with an office other than party A's office.

If call transfer capabilities have been assigned, party A can transfer party B to the remote NFA connection. The AMA records generated for any calls that are extended by the remote NFA connection use the DN associated with the PIN that was used to establish the connection as the originating DN.

### Call Waiting

When a subscriber is connected to the IP with SAID Remote Access, the DMS ignores the "IP dial" if Call Waiting is active ( the IP is not allowed to dial). However, when Call Waiting is active, the subscriber can still switch between the IP connection and the incoming call by flashing. Once the Call Waiting becomes inactive, the DMS can recognize the "IP dial" from the IP ( the IP can initiate dialing).

## Activation/deactivation by the end user

### Activation/deactivation of NFA: Remote Access, Flash Processing by the end user

#### *At your telephone:*

- 1 Go off-hook.  
Response:  
Receive dial tone.
- 2 Dial a DISA directory number DN to the office serving the NFRA subscriber set.

## **NFA: Remote Access, Flash Processing** (continued)

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Response:

1. If NFRA is the only remote DISA feature assigned to the DISA DN, the feature is activated automatically and the subscriber then enters the DN and PIN, as described in the next step.
  2. If more than one remote DISA feature is assigned to the DISA DN, the subscriber then enters that feature's activation code.
  3. If hardware resources are not available to process the call, the subscriber receives no service circuit (NOSC) treatment and must reattempt the call.
  4. If software resources are not available to process the call, the subscriber receives NOSR treatment and must reattempt the call.
- 3** Enter the DN of the subscriber set plus a PIN, and an octothorpe (#) to signal the end of dialing on Digitone sets.

Response:

1. If an incorrect DN or PIN is entered, the subscriber receives feature not allowed (FNAL) treatment.
2. If the correct DN and PIN are entered, a remote connection is established between the originator and an NFA trunk.

The call between the remote subscriber and the NFA trunk remains in place until either party disconnects or until either step 4 or step 5 occurs.

- 4** Flash the switchhook

Response:

1. If the NFA trunk connection is a remote access to the same office as the one serving the originator, then a flash is propagated on the NFA trunk.
  2. If the switchhook is flashed, the subscriber can put the NFA trunk on hold in order to activate another feature.
  3. If the switchhook is flashed, the subscriber can put the NFA trunk on hold in order to connect to another call.
  4. If the switchhook is flashed, the subscriber can remove the NFA trunk connection from hold and the trunk will be reconnected to the call.
  5. If the NFA trunk connection is a remote access to a different office than the one serving the originator, then a flash is not propagated on the NFA trunk.
- 5** IP dials digits

Response:

The DMS switch receives digits from the IP as specified in the existing protocol for IP dialing. Once the end of digits indication is received, the NFA trunk connection to the IP is disconnected.

## **Billing**

NFA: Remote Access, Flash Processing uses Bellcore billing format. AMA record generation is based on the subscribers datafill. Call code types 174 and 175, which use an existing structure code 00001, and module code 047 are used to record NFA billing information.

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## NFA: Remote Access, Flash Processing (continued)

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Call type 174 records explicit connections (in BCS34), as well as remote connections (in BCS35). The terminating DN corresponds to the feature access code used on explicit connections. The terminating DN contains zeros on remote connections.

### Station Message Detail Recording

NFA: Remote Access, Flash Processing does not affect Station Message Detail Recording.

### Datafilling office parameters

When digit collection is initiated on a line that has activated NFA implicit access, a UTR connection is made to the subscribers line if the lines peripheral is engineered with UTR cards. The possibility of talkoff associated with UTR cards exists if the frequency of the subscribers voice is so close to the frequency of a DTMF tone that the UTR cannot distinguish between the two. In order to decrease the possibility of UTR talkoff, NFA implicit access traffic can be routed to network DTMF receivers for digit collection. A new office parameter called NFA\_IMPLCT\_BYPASS\_UTR is added to table OFCENG and is set with a default value of N. If this parameter is set to N during an implicit access connection, digit collection is performed with UTRs, provided the lines peripheral is equipped with them. If the line's peripheral is not equipped with UTRs, network DTMF receivers are used for digit collection.

If this parameter is set to Y during an implicit access connection, the UTRs are bypassed whenever digit collection is initiated. Network DTMF receivers on the NT2X48 card are always used for digit collection for lines with NFA implicit access capabilities.

- The value in the office parameter NFA\_IMPLCT\_BYPASS\_UTR only impacts the digit collection procedures for lines that have initiated a flash or gone off-hook to activate the NFA implicit access feature. It does not impact the digit collection procedures for any other features.
- The office parameter NFA\_IMPLCT\_BYPASS\_UTR does not affect NFA lines which use DP digit collection procedures.
- If the office parameter NFA\_IMPLCT\_BYPASS\_UTR has been set to Y, UTR will never be used for digit collection for lines that have activated the NFA implicit access feature. UTRs will never be used even if all the network DTMF receivers are busy.

## NFA: Remote Access, Flash Processing (continued)

The following table shows the office parameters used by NFA: Remote Access, Flash Processing. For more information about office parameters, refer to the *Office Parameters Reference Manual*.

### Office parameters used by NFA: Remote Access, Flash Processing

Table name	Parameter name	Explanation and action
OFCENG	NFA_IMPLCT_BYPASS_UTR	This parameter allows an office to bypass using UTRs for digit collection on lines that have activated the NFA implicit access feature. Instead, network DTMF receivers are used for digit collection. Default is N. Activation is immediate.
<b>Note:</b> This parameter does not affect NFA lines which use DP digit collection.		

### Datafill sequence

The following table lists the tables that require datafill to implement NFA: Remote Access, Flash Processing. The tables are listed in the order in which they are to be datafilled.

### Datafill tables required for NFA: Remote Access, Flash Processing (Sheet 1 of 4)

Table	Purpose of table
CLLI	Common Language Location Identifier. The NFA trunk group type must be datafilled in table CLLI.
TRKGRP	Trunk Group. Table TRKGRP contains some of the customer-defined data associated with each trunk group that exists in the switch.  A trunk group type (NFA) is added, and field ANSTOUT specifies time in seconds within which the far end of the NFA trunk has to respond with answer supervision after its seizure from the DMS-100 switch.
TRKSGRP	Trunk Subgroup. Table TRKSGRP lists the signaling information for each subgroup that is assigned to one of the trunk groups listed in table TRKGRP.  <b>Note:</b> Fields in a tuple used for NFA are restricted to specific values.
TRKMEM	Trunk Member. Table TRKMEM lists the data associated with each trunk that is assigned to one of the trunk groups and subgroups specified in table TRKGRP and table TRKSGRP.  <b>Note:</b> Fields in a tuple used for NFA are restricted to specific values.

## NFA: Remote Access, Flash Processing (continued)

### Datafill tables required for NFA: Remote Access, Flash Processing (Sheet 2 of 4)

Table	Purpose of table
XLANAME	List of Translator Names. Table XLANAME defines the AIN translator names. Customer group translators reflect the class of service for the customer group. The preliminary translator states the exceptions to the network class of service (NCOS).
DIGCOL	Digit Collection. Table DIGCOL defines the digit collection procedures and the dialing plan.
ANNS	Announcements. Table ANNS defines the announcement used by the NFRA feature. The announcement phrases are datafilled in table DRMUSERS.  <b>Note:</b> Announcement type NFRA must be used for the ANNTYP field when defining the NFRA announcement.
ANNMEMS	Announcement Members. Table ANNMEMS contains information about announcement group members defined in table ANNS.
DRAMS	Digital Recorded Announcement Machine. Table DRAMS lists information for the trunk cards that constitute a digital recorded announcement machine. This table is required if the DMS switch has software package BCS7 and higher and is equipped with a digital recorded announcement machine.
DRMUSERS	Digital Recorded Announcement Machine Users. Table DRMUSERS contains the lists of phrases that constitute one announcement.
DRAMTRK	Digital Recorded Announcement Machine Track. Table DRAMTRK lists information for the trunk cards that constitute a digital recorded announcement machine. This table is required if the DMS switch has software package BCS7 and higher and is equipped with a digital recorded announcement machine.
CUSTENG	Customer Engineering. Table CUSTENG defines the engineering parameters and options for each of the customer groups. One of these parameters is the maximum NCOS value (up to 255) that can be assigned to a customer group.
CUSTHEAD	Customer Group Head. Table CUSTHEAD contains data that applies to all lines in a customer group. Some data, such as the digit collection name, is entered for all tuples in the table. Other data, such as a feature translator name, are optional.
CUSTNAME	Customer Name. Table CUSTNAME defines the customer group names. In most of the examples in this chapter, customer group names IBNTST and RESGRP are used.
NCOS	Network Class of Service. Table NCOS and a subscribers customer group are used to index to table NCOS, which specifies the feature translator name in field FEATXLA. The XLAS option must be used for field NCOSOPTN if order to be able to specify a feature translator name in the FEATXLA field.

**NFA: Remote Access, Flash Processing** (continued)

**Datafill tables required for NFA: Remote Access, Flash Processing (Sheet 3 of 4)**

Table	Purpose of table
CUSTSTN	<p>Customer Station. Table CUSTSTN defines remote access datafill specific to a customer group.</p> <p>Option NFRA is available for fields OPTNAME and OPTION. These fields specify that the customer group has the NFRA option and that lines in that group may have the remote access capability to NFA assigned to them.</p> <p>Three subfields are associated with the NFRA option: REMTRKGP (trunk group for remote accesses), REM_SC (remote access service code), and NUMDIGS (number of digits required to translate the subscribers home DN).</p>
DNROUTE	<p>Directory Number Route. Table DNROUTE defines the DISA DN, including its CUSTGRP, SUBGRP, NCOS, and other DISA options.</p> <p>Option NFRA is available for the DISAOPT subfield and is used to indicate that the DISA DN can be used for remote access to NFA.</p> <p>Option NCOSOPT is available for the second DISAOPT subfield. It is suggested that this option be used on DISA DNs that have been assigned the NFRA option.</p>
IBNLINES	<p>BN Lines. Table IBN lines is used to specify the customer group of an individual MDC or RES line. Also specified are a subgroup, the SNPA and a NCOS.</p> <p>For MDC lines, the customer group is specified in this table. For RES lines, a line attributes index (LAI) into table LINEATTR (like POTS) is used. This LAI is specified in IBNLINES and must be marked in table LINEATTR as supporting RES lines.</p>
LINEATTR	<p>Line Attribute. Table LINEATTR is used to identify the customer group for RES lines, as well as subgroup and NCOS. The LAI must be marked as supporting RES service before the conversion from POTS to RES will be performed, by setting the RESINFO field to Y. It is recommended that all RES lines be entered in the same customer group.</p>
IBNXLA	<p>IBN Translations. Table IBNXLA defines the NFRA feature access code for use in selecting among different DISA remote access options.</p> <p>Option NFRA is available for field FEATURE and is used to remotely access the NFA option. The access code for NFRA can only be entered by a subscriber who is selecting an option to use with DISA.</p> <p>Subfield EXT_CONV is added to each tuple that has been datafilled with a FTR selector of NFAEXPL. This subfield indicates whether or not extended conversion is required for calls initiated with that feature access code.</p>

**NFA: Remote Access, Flash Processing** (continued)

**Datafill tables required for NFA: Remote Access, Flash Processing (Sheet 4 of 4)**

Table	Purpose of table
IBNFEAT	<p>IBN Features. Table IBNFEAT defines the NFA features for a subscribers line.</p> <p>Three subfields activate NFA remote access: REM_ACC (remote access), AMA_REM (remote AMA), NFRAPIN (NFRA personal identification number). When Y is entered for subfield REM_ACC, remote access to NFA is allowed. Then subfield AMA_REM is prompted, which indicates whether an AMA record should be generated to record the connection to the NFA trunk. Subfield NFRAPIN specifies the PIN which the subscriber must use in order to initiate a remote NFA connection.</p>
LCCOPT	<p>Line Class Code Compatible Options. Table LCCOPT is a read only table that cannot be modified by the customer. When adding lines by service order, this table and the incompatible options table (OPTOPT) are referenced to ensure the compatibility between line class code and options to ensure that incompatible options are not added to the same line.</p>

**Datafilling table ANNS**

The following table shows the datafill specific to NFA: Remote Access, Flash Processing for table ANNS. Only those fields that apply directly to NFA: Remote Access, Flash Processing are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table ANNS (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
CLLI		alphanumeric	Announcement common language location identifier. This field specifies the announcements in table CLLI. Enter the alphanumeric code that represents the announcement in table CLLI.
ANTYPE		NFRA	Announcement type. This field specifies the announcement type. Enter NFRA.
TRAFSNO		0 to 127	Traffic separator number. This field specifies whether or not the switching unit has the optional traffic separation software. Enter the outgoing traffic separation number from 1 to 127 if the switch has the traffic separation software. If not, enter 0.

**NFA: Remote Access, Flash Processing** (continued)**Datafilling table ANNS (Sheet 2 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
MAXCONN		0 to 255	Maximum connections. Enter 1. AIN announcements only allow a maximum of one simultaneous connection per channel when an announcement is playing. Valid entries are from 0 to 255.
CYTIME		0 to 18	Cycle time. Enter 0. The actual cycle time is determined by the DRAM utility when an announcement is played. Valid entries are from 0 to 18.
MAXCYC		0 to 255	Maximum cycles. Determines the number of times an announcement (ANN) is to be played for a user. Valid entries are from 0 to 255.

**Datafill example for table ANNS**

The following example shows sample datafill for the NFRA feature in table ANNS. In this example, NFRA is the announcement type used for the NFRA announcement, and STND is the announcement type used for the DISA announcement.

**MAP display example for table ANNS**

Table: CLLI					
CLLI	ANTYPE	TRAFSNO	MAXCONN	CYTIME	MAXCYC
NFRAANN	NFRA	23	15	0	1
DISARAC	STND	23	15	12	1

**Datafilling table CUSTSTN**

The following table shows the datafill specific to NFA: Remote Access, Flash Processing for table CUSTSTN. Only those fields that apply directly to NFA:



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## NFA: Remote Access, Flash Processing (continued)

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Remote Access, Flash Processing are shown. For a description of the other fields, refer to the data schema section of this document.

### Datafilling table CUSTSTN

Field	Subfield or refinement	Entry	Explanation and action
CUSTNAME		alphanumeric (1 to 16 characters)	Customer group name. This field specifies a customer group name. Enter the 1- to 16-character alphanumeric name.
OPTNAME		NFRA	Option name. This field specifies an option name. Enter NFRA.
OPTION		NFRA	Option. This field specifies the NFRA option on a customer group basis and retrieves the value for NFRA. Enter NFRA.
	REMTRKGP	alphanumeric	Remote trunk group. This subfield specifies the trunk group over which a remote connection is made upon activation of NFA remote access. The trunk group selected must already be datafilled in table TRKGRP with a GRPTYP of NFA. Enter the remote trunk group name.
	REMSC	1 to 5 digits (0 to 9, #, *, or \$)	Remote service code. This subfield specifies the service code that is outpulsed over the remote trunk during a remote access. Valid entries are from 1 to 5 digits, from 0 to 9, #, or *. Also, a \$ can be entered to indicate that a service code is not assigned to this subscriber.
	NUMDIGS	numeric (1 to 10)	Number of digits. This subfield specifies the length (in digits) of the NFRA subscribers DN (base station). This value depends on the number of digits required for extension dialing in the customer group dialing plan. RES customers have a 7 datafilled here, while IBN customers may have a 4. Enter a value from 1 to 10.

### Datafill example for table CUSTSTN

NFRA is added to the OPTNAME and OPTION fields. These fields specify that the customer group has the NFRA option and that lines in that group may have the remote access capability to NFA assigned to them.

REMTKGP is the trunk group over which a remote connection is made upon activation of NFA remote access. The trunk group selected must already be

**NFA: Remote Access, Flash Processing** (continued)

datafilled in table TRKGRP with a GRPTYP of NFA. REM\_SC is the service code that is outpulsed over the NFA trunk during a remote access. NUMDIGS is the number of digits that the subscriber needs to enter in order to identify their home telephone number.

The following example shows sample datafill for the NFRA feature in table CUSTSTN. In this example, the customer group IBNTST is assigned the NFA Remote Access, Flash Processing feature.

**MAP display example for table CUSTSTN**

Table: CUSTSTN				
CUSTNAME	OPTNAME			OPTION
-----				
IBNTST	NFRA	NFRA	NFRATKGP	99999 7

**Datafilling table DNROUTE**

The following table shows the datafill specific to NFA: Remote Access, Flash Processing for table DNROUTE. Only those fields that apply directly to NFA: Remote Access, Flash Processing are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table DNROUTE (Sheet 1 of 3)**

Field	Subfield or refinement	Entry	Explanation and action
AREACODE		numeric (3 digits)	Area code. This subfield specifies the area code to which the NFA is assigned. Enter the area code.
OFCODE		numeric (3 digits)	Office code. This subfield specifies the office code of the DISA DN. Enter the office code.
STNCODE		numeric (4 digits)	Station number code. This subfield specifies the station number of the DISA DN. Enter the station number.
DNRESULT			Directory number result. This field consists of several subfields. Explanations follow.
	DN_SEL	FEAT	Directory number selector. This subfield specifies the DN selector. Enter FEAT.

---

**NFA: Remote Access, Flash Processing** (continued)

---

Datafilling table DNROUTE (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	FEATURE	DISA	<p>Feature. This refinement specifies the feature to be added. Enter DISA.</p> <p><b>Note 1:</b> If DISA is entered for FEATURE, subfields CUSTGRP, SUBGRP, AUTHREQ, SMDRTO, SMDRFROM, INTRAGRP, and OPTIONS require datafill.</p> <p><b>Note 2:</b> The values of fields AUTHREQ, SMDRTO, and SMDRFROM do not affect the NFRA feature.</p>
	CUSTGRP	alphanumeric (1 to 16 characters)	Customer group. Enter the customer group name to which the DISA DN belongs. Valid entries are from 1- to 16-characters long.
	SUBGRP	0 to 7	Subgroup. Enter the subgroup in the customer group to which the DISA DN belongs. Valid entries are from 0 to 7.
	AUTHREQ	Y or N	Authorization required. This subfield specifies whether an authorization code is required for users of this DISA DN. Valid entries are Y or N.
	SMDRTO	Y or N	Station message detail recording to. This subfield specifies whether or not the originator accesses DISA. Valid entries are Y or N.
	SMDRFROM	Y or N	Station message detail recording from. This subfield specifies whether SMDR is required on the leg of the call from DISA to the final destination. Valid entries are Y or N.
	INTRAGRP	Y or N	Intragroup. This subfield specifies whether SMDR is part of an intragroup. Valid entries are Y or N.

**NFA: Remote Access, Flash Processing** (continued)

Datafilling table DNROUTE (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	OPTIONS	see subfield	DISA options. This subfield consists of subfield DISAOPT.
	DISAOPT		DISA option. This subfield specifies the DISA options. Enter NCOSOPT followed by the NCOS to be used by the DISA DN. The NCOSOPT should be used to specify the network class of service for use by the DISA DN.  <b>Note:</b> It is recommended that a specific NCOS be assigned to each DISA DN used for NFRA access. The NCOS can be assigned by adding the NCOSOPT to the DISA DN as a DISAOPT.

**Datafill example for table DNROUTE**

The following example shows sample datafill for the NFRA feature in table DNROUTE. In this example, NFRA is added to the DISAOPT range. When this option is assigned to a DISA DN, the DN can be used to remotely access the NFA feature.

**MAP display example for table DNROUTE**

Table: DNROUTE			
AREACODE	OFCCODE	STNCODE	DNRESULT
613	621	1000	FEAT DISA IBNTST 0 N N N N (NFRA) (NCOSOPT 0) \$

**Datafilling table IBNXLA**

The following table shows the datafill specific to NFA: Remote Access, Flash Processing for table IBNXLA. Only those fields that apply directly to NFA:

## NFA: Remote Access, Flash Processing (continued)

Remote Access, Flash Processing are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table IBXLA (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
KEY		see subfield	Key field. This field consists of subfields XLANAME and DGLIDX.
	XLANAME	alphanumeric (1 to 8 characters)	Translator name. Enter the 1- to 8-character name assigned to the translator as the access code.
	DGLIDX	(digits assigned to index)	Digilator index. Enter the 2 digit or digits assigned to the index. This access code is used by DISA users who must distinguish NFRA from other DISA features.
RESULT			Result. This field consists of several subfields, depending upon the feature activation.
	TRSEL	FEAT or FTR	Translation selector. This subfield specifies the translation selector type. Enter FEAT or FTR.  <b>Note:</b> If FEAT is entered, subfields ACR, VCDR, and FEATURE require datafill.
	ACR	Y or N	Account code entry. This subfield specifies whether or not an account code entry is required. Valid entries are Y or N.
	SMDR	Y or N	Station Message Detail Recording. This subfield specifies whether or not SMDR is required for calls originated by a customer group station or an attendant console. Valid entries are Y or N.
	VCDR	N	Variable call detail record. Enter N.
	FEATURE	NFRA	Feature. This subfield specifies the feature assigned to the access code. Enter NFRA.  <b>Note:</b> If NFRA is entered, subfields NO_ACCODE_DIGITS and FTR_TYP are presented.
	NO_ACCODE_DIGITS	numeric (0 to 7)	Number of activation code digits. This subfield specifies the number of digits in the activation code. Valid entries are from 0 to 7.

## NFA: Remote Access, Flash Processing (continued)

### Datafilling table IBNXLA (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	FTR_TYPE	NFAEXPL	<p>FTR selector. This subfield specifies the feature selector. Option NFAEXPL is added to datafill access codes for explicit access. Enter NFAEXPL.</p> <p><b>Note:</b> If NFAEXPL is entered, subfields EXPLTKGP, EXPL_SC, and EXT_CONV require datafill.</p>
	EXPLTKGP	NFA	<p>Explicit trunk group. This subfield specifies the trunk group over which an explicit connection is made. Enter NFA.</p> <p><b>Note:</b> The trunk group entered must have been datafilled already in table TRKGRP with a GRPTYP of NFA.</p>
	EXPL_SC	1 to 5 digits (0 to 9, #, or *)	<p>Explicit service code. Enter the service code to be outpulsed over the NFA trunk during an explicit access. Valid entries are from 1 to 5 digits, from 0 to 9, #, or *.</p>
	EXT_CONV	Y or N	<p>Extended conversion. This subfield specifies whether or not extended DP to DTMF conversion is to be performed for all NFA calls that originate from this feature access code. Valid entries are Y or N.</p> <p><b>Note:</b> The value should be set to N for base DP to DTMF conversion.</p>

### Datafill examples for table IBNXLA

The following examples show sample datafill for the NFRA feature in table IBNXLA. In the first example, FEAT selector NFRA is used to define remote access to NFA.

---

**NFA: Remote Access, Flash Processing** (continued)
 

---

**MAP display example for table IBNXLA**

Table: IBNXLA	
KEY	RESULT
-----	
NFAXLA1 78	FEAT N N N NFRA

In the second example, FTR selector NFAEXPL is used to define extended conversion.

**MAP display example for table IBNXLA**

Table: IBNXLA	
KEY	RESULT
-----	
NFAXLA1 79	FTR 2 NFAEXPL NFATKGP1 9999 Y

**Datafilling table IBNFEAT**

The following table shows the datafill specific to NFA: Remote Access, Flash Processing for table IBNFEAT. Only those fields that apply directly to NFA: Remote Access, Flash Processing are shown. For a description of the other fields, refer to the data schema section of this document.

**CAUTION****Incompatible features may be assigned**

Use the Service Order System, not table editor, to add and delete a tuple to and from table IBNFEAT.

Using the table editor to datafill this table can result in incompatible features being assigned to the line. The table datafill shown here is for information only.

## NFA: Remote Access, Flash Processing (continued)

Datafilling table IBNFEAT (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LEN		see subfields	Line equipment number. This field consists of the subfields SITE, FRAME, UNIT, DRAWER, LSG, and CIRCUIT. Refer to data schema section of this document for complete details on these subfields. Enter the LEN.
DNNO		0 to 6	Directory number number. This field specifies the DN of the LEN being referenced. Enter a value from 0 to 6 for the DN.
DF		NFA	Data feature. This field specifies the data feature assigned to the line. Enter NFA.
FEATURE		NFA	Feature. This field specifies the data feature assigned to the line. Enter NFA.
DATA		see subfields	Data. Data is composed of subfields USR_ID, IMPLCT_AC, and REM_ACC. Explanations follow.
	USR_ID	1 to 10 digits	User identification. Enter the lines one to 10-digit user ID.
	IMPLCT_ ACC	Y or N	Implicit access code. This subfield specifies whether or not the subscriber is allowed implicit access to the NFA trunk. Enter Y or N.  <b>Note:</b> If Y is entered for IMPLCT_ACC, subfields IMPLCT_SC and IMPLCT_STAT require datafill.
	IMPLCT_SC	numeric (1 to 5 digits)	Implicit service code. Enter the service code that is outpulsed over the NFA trunk during an implicit access.
	IMPLCT_ STAT	ACT or INACT	Implicit status. This subfield specifies the status of implicit access. Valid entries are ACT or INACT.



---

**NFA: Remote Access, Flash Processing** (continued)

---

Datafilling table IBNFEAT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	EXPLCT_ ACC	Y or N	Explicit access code. This subfield specifies whether or not the subscriber is allowed explicit access to the NFA trunk. Enter Y or N.  <b>Note:</b> If Y is entered for EXPLCT_ACC, subfields AMA_EXPLCT and AMA_IPDIAL are presented.
	AMA_ EXPLCT	Y or N	Automatic message accounting explicit. This subfield specifies whether or not an AMA record is generated following an explicit connection to the NFA trunk. Enter Y or N.
	AMA_IPDIAL	Y or N	Automatic message accounting IP dialing. This subfield specifies whether or not an AMA record is generated following a call that was dialed by the IP. Enter Y or N.
	REM_ACC	Y or N	Remote access. This subfield specifies whether or not the subscriber is allowed remote access to the NFA trunk. Enter Y or N.  <b>Note:</b> If Y is entered for REM_ACC, subfields AMA_REM and NFRAPIN require datafill.
	AMA_REM	Y or N	Remote automatic message Accounting. This subfield specifies whether or not an AMA record is generated following a remote connection to the NFA trunk. Enter Y or N.
	NFRAPIN	numeric (2 to 10)	NFRA personal identification number. Enter the 2-to 10-digit PIN the subscriber must use in order to initiate a remote NFA connection.

**Datafill example for table IBNFEAT**

The following example shows sample datafill for the NFRA feature in table IBNFEAT.

---

**NFA: Remote Access, Flash Processing** (continued)

---

**MAP display example for table IBNFEAT**

Table: IBNFEAT												
LEN					DNNO		DF		FEATURE			DATA
-----												
HOST	00	0	09	07	0		NFA		NFA			
					6211233	Y	33	INACT	Y	N	N	Y Y 654321

**Translation verification tools**

The following example shows the output from the TRAVER (translations verification) command when it is used to verify NFA: Remote Access, Flash Processing. In this example, line 6215001 dials a DISA DN 6211012, which has been assigned the NFRA option.

---

**NFA: Remote Access, Flash Processing** (continued)
 

---

**TRAVER output example for NFA: Remote Access, Flash Processing**

```

>traver I 6215001 6211012 b
TABLE IBNLINES
HOST 00 0 08 01 0 DT STN RES 6215001 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
613 621 5001
  (PUBLIC ( NAME TOM_WATSON) $)$ $
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
TABLE IBNXLA: XLANAME RXCMN2
TUPLE NOT FOUND
default from table XLANAME:
RXCMN2
  (NET N N N 0 N NDGT N Y GEN ( LATTR 1) (EA MCI Y 0) $)$ 9
TABLE DIGCOL
NDGT specified: digits collected individually
TABLE LINEATTR
1 1MR NONE NT FR01 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 0 NIL
  NIL 00 N $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE STDPRTCT
P621 ( 1) ( 0) 0

```

---

## NFA: Remote Access, Flash Processing (continued)

---

### TRAVER output example for NFA: Remote Access, Flash Processing (continued)

```
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
. 621 632 N NP 0 NA
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE HNPACONT
613 128 2 ( 36) ( 1) ( 0) ( 0) 0
. SUBTABLE HNPACODE
. 621 621 DN 613 621
TABLE TOFCNAME
613 621
TABLE DNINV
613 621 1012 FEAT DISA RESGRP 0 N N N Y (NCOSOPT 0) (NFRA ) $
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE LCASCRCN
613 L613 ( 28) OPTL N
. SUBTABLE LCASCR
. 621 622
TABLE PFXTREAT
OPTL NP Y NP UNDT
TABLE CLSVSCRC
KEY NOT FOUND
DEFAULT IS TO LEAVE XLA RESULT UNCHANGED

+++ TRAVER: SUCCESSFUL CALL TRACE +++
DIGIT TRANSLATION ROUTES
1 Feature 6136211012 ST
TREATMENT ROUTES. TREATMENT IS: GNCT
```

## SERVORD

The NFA: Remote Access, Flash Processing feature is assigned to individual subscriber lines using the service order system (SERVORD).

### SERVORD limitations and restrictions

NFA: Remote Access, Flash Processing has no SERVORD limitations and restrictions.

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## NFA: Remote Access, Flash Processing (continued)

---

### SERVORD prompts

The following table shows the SERVORD prompts used to assign the NFA: Remote Access, Flash Processing feature to a line.

#### SERVORD prompts for NFA: Remote Access, Flash Processing

Prompt	Valid input	Explanation
OPTION	NFA	Assigns NFA to the line.
USR_ID	numeric	Specifies the user ID.
IMPLCT_ACC	Y or N	Allows implicit access to the NFA trunk.
IMPLCT_SC	numeric	Specifies the service code that is outputted over the NFA trunk during an implicit access.
IMPLCT_STAT	ACT / INAC	Specifies the status of implicit access.
EXPLCT_ACC	Y or N	Allows explicit access to the NFA trunk.
AMA_EXPLCT	Y or N	Allows AMA record generation following an explicit connection to the NFA trunk.
AMA_IPDIAL	Y or N	Allows AMA record generation following an IP dialed call.
REM_ACC	Y or N	Allows remote access to the NFA trunk.
AMA_REM	Y or N	This prompt only appears if REM_ACC is set to Y. Allows AMA record generation following a remote connection to the NFA trunk.
NFRAPIN	numeric	This prompt only appears if REM_ACC is set to Y. Enter the remote access PIN.

### SERVORD example for adding NFA: Remote Access, Flash Processing

The following SERVORD example shows how the NFA: Remote Access, Flash Processing is added to an existing line using the ADO command. This line is assigned remote access to NFA.

---

## NFA: Remote Access, Flash Processing (continued)

---

### SERVORD example for NFA: Remote Access, Flash Processing in prompt mode

```
>SERVORD
SO:
>ADO
SO NUMBER NOW 91 6 5 PM
>(CR)
DN_OR_LEN
>6215001
OPTION:
>NFA
USR_ID: 6215001
>(CR)
IMPLCT_ACC: Y
>N
EXPLCT_ACC: Y
>Y
AMA_EXPLCT: N
>(CR)
AMA_IPDIAL: N
>Y
REM_ACC: N
>Y
AMA_REM:
>Y
NFRAPIN:
>654321
OPTION:
>$
COMMAND AS ENTERED: ADO NOW 91 6 5 PM 6215001
(NFA 6215001 N Y N Y Y Y 654321) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
```

### SERVORD example for NFA: Remote Access, Flash Processing in no-prompt mode

```
>ADO $ 6215001 NFA 6215001 N Y N Y Y Y 654321 $ Y
```

The following SERVORD example shows how the NFA: Remote Access, Flash Processing is added to an existing line using the ADO command. This line is not assigned explicit access.

---

## NFA: Remote Access, Flash Processing (end)

---

### SERVORD example for NFA: Remote Access, Flash Processing in prompt mode

```

>SERVORD
SO:
>ADO
SO NUMBER NOW 91 6 5 PM
>(CR)
DN_OR_LEN
>6215001
OPTION:
>NFA
USR_ID: 6215001
>(CR)
IMPLCT_ACC: Y
>N
EXPLCT_ACC: Y
>N
AMA_IPDIAL: N
>(CR)
REM_ACC: N
>Y
AMA_REM:
>N
NFRAPIN:
>654321
OPTION:
>$
COMMAND AS ENTERED:ADO NOW 91 6 5 PM 6215001
(NFA 6215001 N N N Y N 654321) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y

```

### SERVORD example for NFA: Remote Access, Flash Processing in no-prompt mode

```
>ADO $ 6215001 NFA 6215001 N N N Y N 654321 $ Y
```

---

## SAID Enhanced Signaling Protocol

---

### Ordering codes

Functional group ordering code: SAID0001

Functionality ordering code: SAID0003

### Release applicability

SAID Enhanced Signaling Protocol was introduced in NA002.

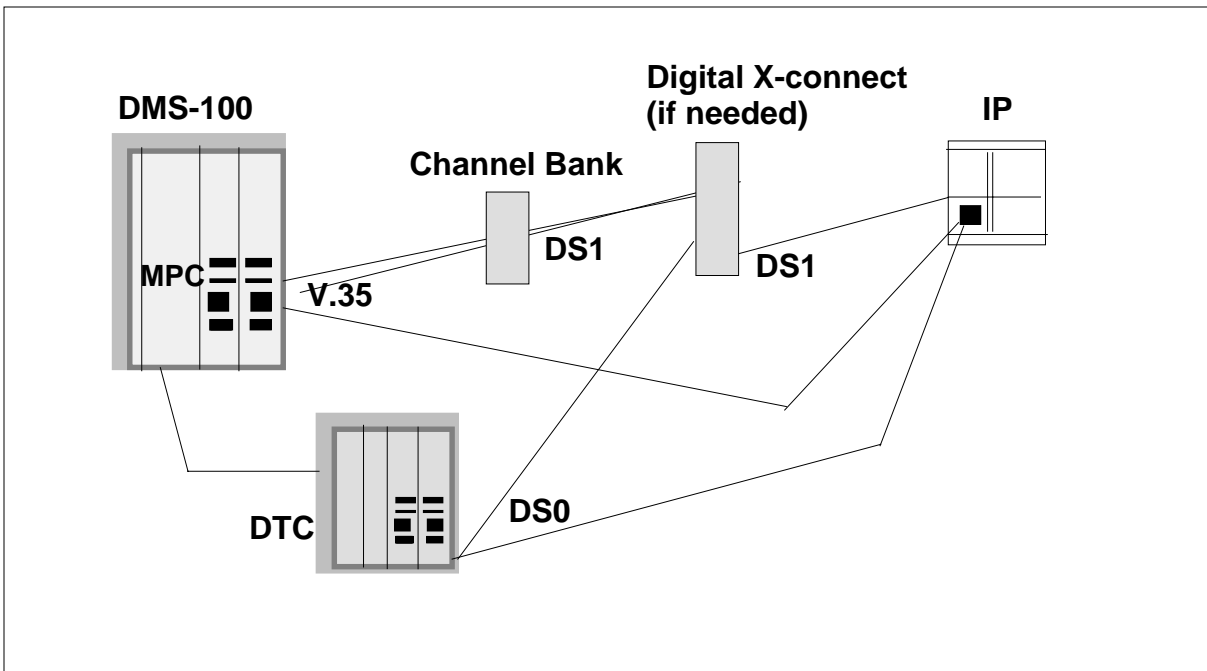
### Prerequisites

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

This feature provides an X.25 multiprotocol controller (MPC) data link between the DMS-100 or DMS-100/200 switch and an intelligent peripheral (IP) module. This link supports one or more X.25 permanent virtual circuits (PVC) that can be associated with network facility access (NFA) trunks to transmit messages. The following figure shows a possible configuration for this link.

### Configuration example





---

## SAID Enhanced Signaling Protocol (continued)

---

This feature also adds a new table, SAIDOFD. This table controls software optionality for two new SAID features, SAID Enhanced Signaling Protocol (AN0831) and NFA Stringing of Digits (SOD) (AN0434).

### Background

The current Speech Activated Intelligent Dialing (SAID) implementation supports voice activated dialing (VAD) using dual-tone multifrequency (DTMF) trunks. For example, a user, after being connected to the IP by means of an NFA trunk, can speak a name ("Mom") from a voice dialing directory. The IP then signals the DMS-100 switch by means of DTMF on the trunk, and the call is placed on the user's behalf just as if the user had dialed the digits. The user can also say, "Return last call," and the IP will signal the feature access code on the DTMF trunk (for example, \*69) just as if the user had dialed.

With the SOD feature, the user can say, for example, "Call Forward to Mom's house," and the IP will dial Call Forwarding (CFW) activation (\*72) followed by a directory number (DN). Features that are accessed by means of feature activation codes and contain two or fewer digit strings will be supported in this manner.

Feature access by means of NFA trunks implements a limited form of voice activated network control (VANC). VAD and VANC are fully supported during call originations. Mid-call control (user flashes during an existing call) is supported for features that would normally be allowed during that call context.

Limitations exist within the current SAID implementation. DTMF signaling implies a call setup time to send and process DTMF digits. Because DTMF does not provide high-bandwidth data delivery, passing more information by this method would make call setup time too long. SAID Enhanced Signaling Protocol implements a supplementary data link so that more data can be passed at higher speeds.

### X.25 protocol considerations

The X.25 protocol provides the physical, link, and packet layers as represented by the seven-layer Open Systems Interconnection protocol model. As such, the X.25 interface that is implemented by the MPC card on the DMS-100 switch provides the electrical interface, link-level flow control and message sequencing, and packet-level flow control and message sequencing. As a result, SAID Enhanced Signaling Protocol needs to implement only the application layer communication between the DMS-100 switch and the IP.

## SAID Enhanced Signaling Protocol (continued)

---

### Application layer communication

SAID Enhanced Signaling Protocol restricts individual data buffer transmission to 512 bytes (which can be interpreted as ASCII characters). All application layer messages must fit within this buffer size.

### Types of messages

The messages carried on the PVCs may or may not be associated with a current SAID call. The message types are described in the following list:

- Call context. SAID line subscribers can reach the IP using one of the following access methods: implicit, explicit, remote, and universal. For each access, DTMF signaling is done on the NFA trunk to set up a call to the IP. With the X.25 link, call context data, that is, information about the call and the SAID subscriber, is sent concurrently with each SAID access to the IP.
- User information. Using the X.25 link, the IP can query the DMS-100 switch about a RES or IBN subscriber during a call or at any other time, and the DMS-100 switch will respond. In this way, the IP can re-request information.
- User program. The IP can send messages to the DMS-100 switch that will modify data associated with RES and IBN users.

The only messages of this type that are implemented under SAID Enhanced Signaling Protocol are CFW programming. Using this message type, the IP can modify the CFW status and destination data and bypass the normal call-processing interface to the feature. (Bypassing the normal call-processing CFW interface also bypasses normal CFW validation, call-processing related operational measurements, and CFW-activation related automatic message accounting (AMA) billing.) Because this type of message is non-call associated, the IP can program a subscriber's CFW service at any time.

- Maintenance. Both the IP and the DMS-100 switch can initiate audit messages to ensure the stability and availability of each X.25 PVC. A lack of response to audit messages is reason to remove individual X.25 PVCs from service and alert maintenance personnel that a service problem exists.
- IP dial. The IP can send messages to the DMS-100 switch that will dial digits on behalf of RES and IBN users.
- SLE. The IP can send messages to the DMS-100 switch that will modify the availability, status, and contents of the SLE list.

---

## SAID Enhanced Signaling Protocol (continued)

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### Message content

Within the application layer, SAID Enhanced Signaling Protocol uses a layered approach for messages. The top layer of fields identifies the DMS-100 switch to which the message applies and the message type, as follows:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME datafilled in table OFCENG.
- MsgType (1 byte). The type is one of the following:
  - C = call context (from DMS to IP)
  - I = user information request (from IP to DMS)
  - J = user information response (from DMS to IP)
  - P = user program request (from IP to DMS)
  - Q = user program response (from DMS to IP)
  - M = maintenance request (either IP or DMS can initiate)
  - N = maintenance response (either IP or DMS responds)
  - D = IP dial request (from IP to DMS)
  - E = IP dial response (from DMS to IP)
  - S = SLE request (from IP to DMS)
  - T = SLE response (from DMS to IP)

### Call context messages

As a voice call is delivered over an NFA trunk to the IP, a concurrent message containing call context information is sent over the X.25 PVC. The call context message contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME datafilled in table OFCENG.
- MsgType (1 byte). The type is C.
- DN (10 bytes). This is the subscriber's DN.
- CallID (6 bytes). This corresponds to a call identifier in the DMS-100 switch.
- CLLI (16 bytes). This is the Common Language location identifier of the NFA trunk that carries the voice portion of the call.
- MemberNum (4 bytes, range 0 to 8192). This is the member number of the NFA trunk that carries the voice portion of the call.
- NFA Service Code (5 bytes). This is the service code that formerly was sent on the NFA trunk by DTMF.

---

**SAID Enhanced Signaling Protocol** (continued)

---

- NFA UserID (10 bytes). This is NFA\_USERID, which is datafilled on the subscriber's line.
- Customer Group (16 bytes). This is CUSTGRP, which is associated with the subscriber's line in table LINEATTR.
- Context (1 byte). This is O (origination) or H (hookflash).
- NFA Access (1 byte). This is I (implicit), E (explicit), R (remote), or U (universal).
- NFA Access Digits (variable up to 30 bytes). These are the digits the user dialed to reach the IP (non-implicit).
- Feature List. This is a list of features available to the subscriber, the status of the features, and data associated with each feature. The contents of the list are controlled by table ASSVFEAT. Each list entry contains the following feature information:
  - FeatID (variable up to 8 bytes). This corresponds to the alphanumeric feature name as datafilled on the DMS-100 switch.
  - Feature Status (1 byte). This is the A (active) or I (inactive) state of the feature.
  - Feature Access (1 byte). This is the type of access to the feature that is given to the user. The possible values are as follows:
    - S (subscriber). The feature is datafilled on the subscriber's line.
    - U (universal). Access is granted through table RESOFC or an office parameter.
    - F (FTRGRP). Access is granted through a feature group that is datafilled on the end user's line.
  - Data (variable up to 80 bytes). Depending on the feature, there may be no data in this field. The following table contains the possible features and the data formats associated with them. For more information about these features, refer to *Subscriber Services Product Guide*.

**Available features and data (Sheet 1 of 3)**

Feature	Feature description	Data format
ACB	Automatic Call Back	number of ACB activations on queue
ACRJ	Anonymous Call Rejection	
AR	Automatic Recall	number of AR activations on queue
CWT	Call Waiting	

---

**SAID Enhanced Signaling Protocol** (continued)

---

**Available features and data (Sheet 2 of 3)**

<b>Feature</b>	<b>Feature description</b>	<b>Data format</b>
CCW	Cancel Call Waiting	
CFBL	Call Forward Busy Line	digit register
CFDA	Call Forward Don't Answer	digit register
CFRA	Call Forwarding Remote Access	PIN
CFW	Call Forwarding	digit register; holding state
CMWI	Class Message Waiting Indication	stutter/ringing/periodic
	<b>Note:</b> CMWI is a sub-option of MWT. It cannot be added to table ASSVFEAT and can only be queried using a feature query request message.	
CNAB	Calling Name Delivery Blocking	
CNDB	Calling Number Delivery Blocking	
COT	Customer Originated Trace	
CPU	Call Pickup	
CXR	Call Transfer	
DGT	Digitone Line	
DRCW	Distinctive Ringing/Call Waiting	
IBN	Integrated Business Network	
MSB	Make Set Busy	
MWT	Message Waiting	MWT notification option
NFA	Network Facility Access	access status
RCHD	Residential Call Hold	
SACB	Subscriber Activated Call Blocking	types of calls blocked
SCA	Selective Call Acceptance	
SCF	Selective Call Forwarding	digit register
SCRJ	Selective Call Rejection	

## SAID Enhanced Signaling Protocol (continued)

### Available features and data (Sheet 3 of 3)

Feature	Feature description	Data format
SCU	Speed Call User	
SCWID	Spontaneous Call Waiting Identification	
SC1	Speed Call Short List	
SC2	Speed Call Long List (L30)	
SC3	Speed Call Long List (L50)	
SDN	Teen Service (Secondary DN)	DN list; SDN option
SL	Secondary Language	
SLVP	Single Line Variety Package	
SOD	Stringing of Digits	
SUPPRESS	Suppress Name/Number Delivery	DN Suppress; name suppress
3WC	Three-way Calling	
WUCR	Wake-up Call Reminder	activation time; ringing time-out

- Call Memory. Incoming call memory (ICM) and outgoing call memory (OCM) are sent to the IP on initial call setup. ICM and OCM are also available as a response to a user information query message. The following tables list the contents of the call memory sent to the IP.

### Outgoing call memory data (Sheet 1 of 2)

OCM field names	Size and format
OCM allocated	1 byte; Y or N
Called DN	variable up to 30 bytes; called DN or UNAVAILABLE
Prefix count	2 bytes; numeric {0 to max_prefix}
DN unusable	1 byte; Y or N
Intraoffice call	1 byte; Y or N
Destination DN privacy	1 byte; S (suppressed) or U (unsuppressed)
Destination name privacy	1 byte; S (suppressed) or U (unsuppressed)
Call forwarded	1 byte; Y or N

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**SAID Enhanced Signaling Protocol** (continued)

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**Outgoing call memory data (Sheet 2 of 2)**

<b>OCM field names</b>	<b>Size and format</b>
Group intercom	1 byte; Y or N
CNDB features	1 byte; CNDB feature status A (active) or I (inactive)
CNAB features	1 byte; CNAB feature status A (active) or I (inactive)
Name/DN block features	1 byte; Name/DN feature status A (active) or I (inactive)
Display	1 byte; A (allowed) or D (disallowed)

OCM may not be allocated for every DN. If OCM is not allocated, the value of field OCM allocated is set to N and the other values in the OCM data structure are not valid.

**Incoming call memory data**

<b>ICM field names</b>	<b>Size and format</b>
ICM allocated	1 byte; Y or N
Time of call	17 bytes; yyyy/mm/dd:hr:mm:ss
Calling DN	variable up to 30 bytes; calling DN or UNAVAILABLE
Network ID	3 bytes; numeric {0 to 255}
Originating address	3 bytes; numeric {0 to 255}
Interworking encountered	1 byte; Y or N
Originating DN privacy	1 byte; S (suppressed) or U (unsuppressed)
Originating name privacy	1 byte; S (suppressed) or U (unsuppressed)
Long distance call	1 byte; Y or N
Intraoffice call	1 byte; Y or N
Group intercom	1 byte; Y or N
Call waiting	1 byte; Y or N
Display	1 byte; A (allowed) or D (disallowed)

## SAID Enhanced Signaling Protocol (continued)

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ICM may not be allocated for every DN. If ICM is not allocated, the value of field ICM allocated is set to N and the other values in the ICM data structure are not valid.

- Direct Inward System Access (DISA) DN. The DN called to get universal SAID service.

### User information messages

With the user information request (I) message, the IP can request information about individual SAID subscribers. The message contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME datafilled in table OFCENG.
- MsgType (1 byte). The type is I.
- DN (10 bytes). This is the DN of the subscriber being queried.
- TransactionID (1 byte). This is a unique ID that the IP associates with this request.
- Request Type (1 byte). The possible types are
  - F = feature request
  - C = complete user query
  - M = memory (both the OCM and the ICM data)
  - V = DN validation request
- Request Data. Request types C and M have no associated data. Request type F messages have the following fields:
  - FeatID (variable up to 8 bytes). This is the name of the feature being queried.
- Request type V messages have the following field:
  - Term\_DN (10 bytes). This is the terminating DN to be queried against the DN of the subscriber.

The user information response (J) message, which the DMS-100 switch returns to the IP, contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME datafilled in table OFCENG.
- MsgType (1 byte). The type is J.
- DN (10 bytes). This is the DN of the subscriber being queried.



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## SAID Enhanced Signaling Protocol (continued)

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- TransactionID (1 byte). This echoes the TransactionID of the message being answered.
- Response Type (1 byte). The possible types are F, C, D, M, P, U, N, or I. (See the next field, Response Data.)
- Response Data (variable depending on the Request Type). The contents can be the following:
  - If the Request Type was F, this field contains the FeatID, Feature Status, Feature Access, and Feature Data as formatted in a call context message.
  - If the Request Type was C, this field contains the NFA Service Code, NFA UserID, Customer Group, complete Feature List, and Call Memory data as formatted in a call context message.
  - If the Request Type was M, this field contains the OCM and ICM data as formatted in a call context message.
  - If the Request Type was V and the validation request failed, the Response Type is F and no data is sent. If the validation request passed, the Response Type is P and no data is sent.  
 If the Request Type was V for an internodal DN, but no TCAP facility is available, the response type is N.
  - If the request failed or the request concerned an unsupported feature, the Response Type is U and no data is sent.
  - If a feature request was performed but the feature is not on the subscriber's line, the Response Type is N.
  - If the IP is denied access to query the feature the Response Type is I.

### User program messages

If the IP is allowed programming access by means of datafill in table ASSVFEAT, then it can change data associated with individual SAID subscribers by sending a user program request (P) message to the DMS-100 switch. A P message contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is P.
- DN (10 bytes). This is the DN of the subscriber being programmed.
- TransactionID (1 byte). This is a unique ID that the IP associates with this request.

## SAID Enhanced Signaling Protocol (continued)

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- FeatID (variable up to 8 bytes). This corresponds to the alphanumeric feature name as datafilled on the DMS-100 switch of the feature being programmed.
- Feature Status (1 byte). This sets the state of the feature to A (active) or I (inactive).
- Feature Data (variable). SAID Enhanced Signaling Protocol implements support only for RES CFW-related features (CFBL, CFDA, CFW, and SCF) and IBN CFW-related features (CBE, CBI, CBU, CDE, CDI, CDU, CFB, CFD, CFF, CFI, and CFU). The subscriber must already be provisioned with the feature being programmed or activated. The IP cannot add a CFW feature to a line. The following data is associated with these features:
  - Digit Register (variable up to 30 bytes). This is a dialable number.

The user program response (Q) message, which the DMS-100 switch returns to the IP, contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is Q.
- DN (10 bytes). This is the DN of the subscriber being programmed.
- TransactionID (1 byte). This echoes the TransactionID of the message being answered.
- FeatID (variable up to 8 bytes). This is the feature being programmed.
- Program Response (1 byte). The following responses can be sent:
  - N (not available). The subscriber does not have access to this feature.
  - F (fail). The attempt to write the feature data failed.
  - P (pass). The data was written successfully.
  - I (IP denied). Table ASSVFEAT or table SAIDOFC does not allow the IP write access to the feature.

### Maintenance messages

The maintenance request (M) message contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is M.
- GrammarVersion (1 byte). The version is X25-1 or X25-2.

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## SAID Enhanced Signaling Protocol (continued)

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The maintenance response (N) message contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is N.
- GrammarVersion (1 byte). The version is X25-1 or X25-2.

### IP dial messages

End users can dial digits using the X.25 link, rather than the NFA trunk, by sending an IP dial request to the DMS-100 switch. The IP dial request (D) message contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is D.
- CallID (6 bytes). This corresponds to a call identifier in the DMS-100 switch.
- DN (10 bytes). This is the DN of the subscriber being programmed.
- TransactionID (1 byte). This is a unique ID that the IP associates with this request.
- Term\_DN (10 bytes). This is the DN being called.

The IP dial response (E) message, which the DMS-100 switch returns to the IP, contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is E.
- CallID (6 bytes). This corresponds to a call identifier in the DMS-100 switch.
- DN (10 bytes). This is the DN of the subscriber being programmed.
- TransactionID (1 byte). This echoes the TransactionID of the message being answered.
- Term\_DN (10 bytes). This is the DN being called.

### SLE messages

If the IP is allowed programming access by means of datafill in table CUSTSTN, then it can change data associated with a SAID subscriber's SLE

**SAID Enhanced Signaling Protocol** (continued)

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list by sending an SLE request to the DMS-100 switch. The SLE request (S) message contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is S.
- CallID (6 bytes). This corresponds to a call identifier in the DMS-100 switch.
- DN (10 bytes). This is the DN of the subscriber being programmed.
- TransactionID (1 byte). This is a unique ID that the IP associates with this request.
- Request Data (variable depending on request). This is the SLE command and associated data. The contents can be the following:
  - ACTIVATE
  - DEACTIVATE
  - DELALL
  - DELPRIV
  - EXIT
  - LISTADD <digit string>
  - LISTDEL <digit string>
  - LISTREV
  - PROGRDN <digit string>
  - QSERVICE
  - START <SLE Feature>
- <SLE Feature>. SCA, SCF, SCRJ, or DRCW.
- <digit string>.

The SLE response (T) message, which the DMS-100 switch returns to the IP, contains the following fields:

- SwitchID (16 bytes). This corresponds to parameter OFFICE\_CLLI\_NAME.
- MsgType (1 byte). The type is T.
- CallID (6 bytes). This corresponds to a call identifier in the DMS-100 switch.
- DN (10 bytes). This is the DN of the subscriber being programmed.

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**SAID Enhanced Signaling Protocol** (continued)

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- TransactionID (1 byte). This echoes the TransactionID of the message being answered.
- Response Type (1 byte). The possible types are F, P, N, or I. (See the next field, Response Data.)
- Response Data (variable depending on the Request Type). The contents can be the following:
  - DN\_NOT\_FOUND
  - FEAT\_NOT\_ACTIVE
  - ILLEGAL\_DN
  - INVALID\_COMMAND
  - INVALID\_DIGITS
  - INVALID\_FEATURE
  - INVALID\_MESSAGE
  - INVALID\_REMOTE
  - IP\_FAIL
  - LIST\_EMPTY
  - LIST\_FULL
  - NO\_LAST\_DN
  - NO\_REMOTE\_DN
  - PROCESS\_PROB
  - SERVICE\_INTERPRT
  - VALIDATION
  - 2ND\_LEG

## Operation

The DMS-100 switch communicates with the IP using the MPC card. The MPC implements X.25 communication that is compliant with International Telegraph and Telephone Consultative Committee (CCITT) standard, as well as other communication protocols. Using an enhanced MPC (1X89BA) card, a single MPC can support one 56/64-kbits/s V.35 link and one 19.2-kbits/s RS232 link. The 56/64-kbits/s link running 1984 CCITT-compliant X.25 is recommended for this feature. However, the feature does not require these settings. Other MPC-supported protocols and links can be used if the IP is set up to handle the interface. For complete information, refer to *MPC Product Guide*.

## SAID Enhanced Signaling Protocol (continued)

Four existing MPC tables and new table ASSVLINK set up the data link between the DMS-100 switch and the IP.

Existing tables MPC and MPCLINK specify the hardware and operating characteristics of the MPC links. In the following maintenance and administration position (MAP) display, the datafill for table MPC specifies MPC card numbers 34, 41, and 2.

### MAP display example for table MPC

MPCNO	MPCIOC	IOCCCT	EQ	DLDFILE
34	3	16	1X89BA	MPC436AB
41	4	4	1X89BA	MPC436AB
2	1	4	1X89BA	MPC436AB

In the following MAP display, the datafill for table MPCLINK specifies port 3 on each card and the protocol to be used.

### MAP display example for table MPCLINK

LINKKEY	LINKALM	PRTCLDAT
34 3	Y	
X2584 55 55	(CLKSRCE EXTERNAL) (ELECSPEC V35) (L2WINDOW 2)	
	(L3WINDOW 2) (L3DATA P256) (NUMPVCS 1) \$ \$	
41 3	Y	
X2584 55 55	(CLKSRCE EXTERNAL) (ELECSPEC V35) (L2WINDOW 2)	
	(L3WINDOW 2) (L3DATA P256) (NUMPVCS 2) \$ \$	
2 3	Y	
X2584 55 55	(CLKSRCE EXTERNAL) (ELECSPEC V35) (L2WINDOW 2)	
	(L3WINDOW 2) (L3DATA P256) (NUMPVCS 1) \$ \$	

SAID Enhanced Signaling Protocol introduces six new application names: ASSVDAT1, ASSVDAT2, ASSVDAT3, ASSVDAT4, ASSVDAT5, and ASSVDAT6. These applications are used to datafill existing tables MPCFASTA and MPCLSET, which create logical groupings of MPC links to provide service to the IP. For a full description of these tables, refer to *GFX892: MPC Multilink Management*.

**SAID Enhanced Signaling Protocol** (continued)

Table MPCFASTA links to a set of MPC logical links. A logical link is termed an MLC because it consists of an MPC card number (M), a link number (L), and a conversation number (C). An MLC is analogous to an X.25 PVC. Table MPCLSET associates an index number with one or more MLCs.

Table MPCFASTA also sets audit messaging parameters. The RECOVERY field defines whether REGULAR or ENHANCED recovery is to be used, if an audit message is not answered within its time limit.

In REGULAR recovery, the DMS sends an ESP Maintenance Request message to the IP. Any X.25 data packet message subsequently received from the IP within the time-out period is considered to be evidence of a successful recovery.

In ENHANCED recovery, the DMS sends an X.25 channel Reset Request message to the IP. The IP must respond by sending back both an X.25 channel Reset Confirm message and an X.25 data packet message within the time-out period.

The RECOVERY field is set on an MPCFAST-by-MPCFAST application basis. Therefore, in order for ENHANCED recovery to be used, every IP connected to an MPCFAST application must support ENHANCED recovery. If even one IP does not support ENHANCED recovery, then REGULAR recovery must be used for all IPs connected to that MPCFAST application.

In the following MAP display, table MPCFASTA defines four MLCs to be part of ASSVDAT(n) applications.

**MAP display example for table MPCFASTA**

INDEX	AUDITYPE	AUDITFRQ	UNITS	RECOVERY	MCLLIST
ASSVDAT1	IDLE	30 SECONDS	ENHANCED	( 34 3 1) ( 41 3 1) ( 2 3 1)\$	
ASSVDAT2	IDLE	30 SECONDS	ENHANCED	( 41 3 2)\$	

In the following MAP display, table MPCLSET defines three logical groupings of the MLCs.

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**SAID Enhanced Signaling Protocol** (continued)

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**MAP display example for table MPCLSET**

LSETKEY	MCLLIST
ASSVDAT1 0	( 3 4 3 1 ) ( 2 3 1 )\$
ASSVDAT1 1	( 4 1 3 1 )\$
ASSVDAT2 0	( 4 1 3 2 )\$

Finally, in the following MAP display, new table ASSVLINK associates NFA trunk members with a link set datafilled in table MPCLSET. The MLCs in each link set will be used for messages corresponding to SAID calls over these NFA trunk members. The link set groupings allow SAID call traffic to be segregated across different sets of MLCs.

**MAP display example for table ASSVLINK**

ASSVLINK	MPCAPPLN	MPCSET
NFACLLI 0	ASSVDAT1	0
NFACLLI 1	ASSVDAT1	0
NFACLLI 3	ASSVDAT1	0
NFACLLI2 0	ASSVDAT1	0
NFACLLI3 1	ASSVDAT1	1

Up to 16 MLCs can be datafilled against each application, and so up to 96 X.25 conversations are available for each DMS-100 switch. The grouping of MLCs associated with an index allows for more than one MLC for each NFA trunk member. If more than one MLC is datafilled in a particular link set, the MLCs are selected using a most idle algorithm.

The same index can be used for any number of NFA trunk members: the trunk-to-MLC relationship is many to many. This relationship allows data communication to be engineered to handle traffic patterns on an individual switch-, IP-, or trunk-level basis.

The association of NFA trunk members with link sets in table ASSVLINK is for call context messages. Except for call context messages, the messages implemented by SAID Enhanced Signaling Protocol are not generated by call processing within the DMS-100 switch. As a result, any MLC that is datafilled



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## SAID Enhanced Signaling Protocol (continued)

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in table MPCLSET as an ASSVDAT(n) MLC can be used to communicate these messages. MLCs in a link set defined in table MPCLSET without associated datafill in table ASSVLINK will be used for non-call context messages only.

In the preceding MAP display, four trunk members are associated with ASSVDAT1 0. Calls made over these trunk members will cause X.25 messages to be sent over MLCs (34 3 1) and (2 3 1) on a most idle basis (see the MAP display for table MPCLSET).

The X.25 messages for the last trunk member will be sent only over (41 3 1). Since ASSVDAT1 1 does not appear in any other tuples in table ASSVLINK, any message that appears on (41 3 1) must correspond to NFACLLI3 1. If the IP requires that individual MLCs be dedicated to individual trunk members, then each tuple in table ASSVLINK must be datafilled in this way. That is, each MPCLSET tuple would contain only one MLC, and each MPCLSET index would appear only once in table ASSVLINK.

Note that ASSVDAT2 0 does not appear in table ASSVLINK, and thus MLC (41 3 2) is used only for non-call-associated messages. If the IP requires that non-call-associated messages be separated from call-associated messages, then this type of MPCLSET entry—with no trunk member association in table ASSVLINK—can be used. This datafill ensures that call context messages are not sent on certain MLCs.

The response to a non-call-associated message is sent on the same MLC as the request. If the MLC is not working the response message is discarded.

**Note:** When a trunk member is datafilled in table ASSVLINK and the X.25 link is available, the NFA userID and service code are no longer outpulsed over the trunk to the IP. All required NFA information is sent across the X.25 link, allowing a quick voice connection to the IP.

### Datafilling supported features

While many features are available to SAID subscribers (see table Available features and data), some of these features need to be restricted to IP access or are simply not needed for services offered by the IP. New table ASSVFEAT manages IP read and write access to these DMS features over the X.25. The table also manages what data is sent over the MLC as part of the call context message.

SAID Enhanced Signaling Protocol implements programming support for a limited set of RES CFW-related features (CFBL, CFDA, CFW, and SCF) and IBN CFW-related features (CBE, CBI, CBU, CDE, CDI, CDU, CFB, CFD, CFF, CFI, and CFU). As a result, field PROGRAM in table ASSVFEAT can

## **SAID Enhanced Signaling Protocol** (continued)

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be set to Y (yes) for only those RES and IBN CFW-related features. Fields CONTEXT and QUERY can be set to Y (yes) for any feature listed in table Available features and data.

### **Translations table flow**

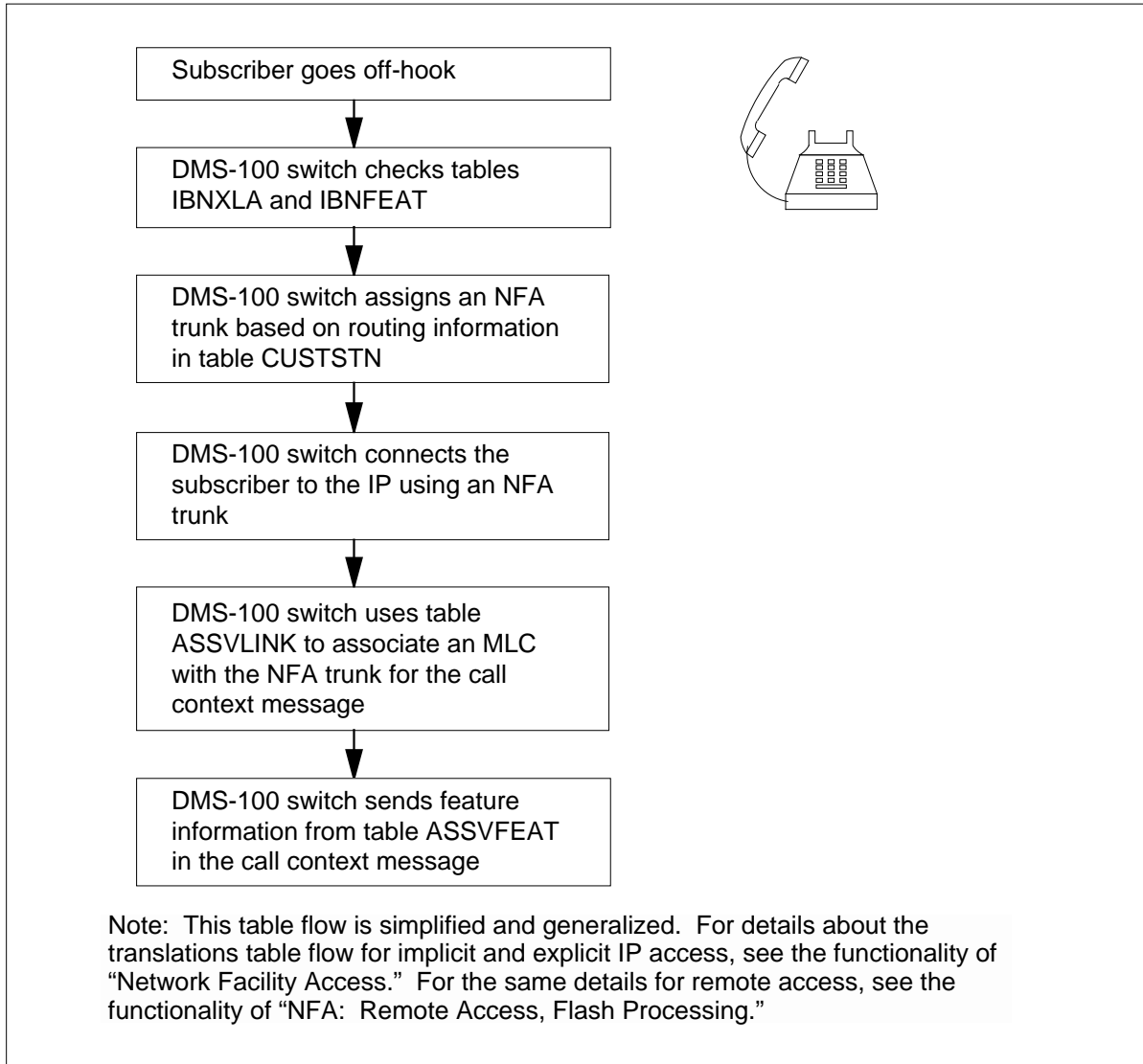
The SAID Enhanced Signaling Protocol translations tables are the following:

- table IBNFEAT
- table IBNXLA
- table CUSTSTN
- table ASSVLINK
- table ASSVFEAT
- table SAIDOFC

The SAID Enhanced Signaling Protocol translation process is shown in the flowchart that follows.

**SAID Enhanced Signaling Protocol** (continued)

**Table flow for SAID Enhanced Signaling Protocol**



The following table lists the datafill content used in the flowchart.

**Datafill example for SAID Enhanced Signaling Protocol (Sheet 1 of 2)**

Datafill table	Example data
TRKGRP	NFACLLI NFA 0 ELO NCRT NIL MIDL 10
IBNFEAT	HOST 00 0 00 3 NFA NFA 6215878 Y Y 654 Y Y N N \$
IBNXLA	IBNXLA1 93 FEAT N N N NFAIMPL

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## SAID Enhanced Signaling Protocol (continued)

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### Datafill example for SAID Enhanced Signaling Protocol (Sheet 2 of 2)

Datafill table	Example data
CUSTSTN	IBNTST NFA NFA NFACLLI 0 7
MPCLSET	ASSVDAT1 0 ( 34 3 1) ( 2 3 1) \$
ASSVLINK	NFACLLI 0 ASSVDAT1 0
ASSVFEAT	CFW Y Y Y
SAIDOFC	SAID_SOD ASSV_CONTEXT

### Limitations and restrictions

The following limitations and restrictions apply to SAID Enhanced Signaling Protocol:

- RES and IBN hunt group lines are supported. However, because members of Distributed Line Hunt (DLH) and Multi-Line Hunt (MLH) hunt groups do not have unique DNs, all queries and program requests for those hunt groups function only on the pilot LEN of the group. This limitation does not apply to members of Bridged Night Number (BNN), Distributed Line Hunt (DNH), and Preferential Hunt (PRH) hunt groups.
- This functionality performs CFW programming by writing directly into switch memory. As a result, all other processing of CFW programming, which is normally done by the call processing interface, does not occur. This includes OM pegs and any AMA records normally associated with CFW programming or activation. However, journal file updates will occur.
- CFW validation does not occur for CFW program messages. (CFW validation is available using a separate validation request message.)
- IP dialing is valid only when the IP is connected to an active call.
- The default ESP protocol is X25-1. In order to use X25-2, the IP must send an initial maintenance message.
- SLE programming can only be performed during an active call with an explicit SAID connection.
- SLE programming does not support extension numbers or speed call codes.

### Interactions

SAID Enhanced Signaling Protocol interacts with the existing SAID functionality by launching X.25 messages that are separate from the DTMF signaling on the NFA trunk. When X.25 is used for a trunk member, the NFA

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## SAID Enhanced Signaling Protocol (continued)

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trunk functionality is changed: the DMS-100 switch no longer outputs DTMF digits to the IP on the NFA trunk member.

As part of its support for IBN lines, this feature supports Meridian Business Sets (MBS).

### Activation/deactivation by the end user

SAID Enhanced Signaling Protocol Version 1 requires no activation or deactivation by the end user. Version 2 is activated for a link when the IP sends an X25-2 maintenance message to the DMS, and deactivated when the IP sends an X25-1 maintenance message to the DMS.

### Billing

SAID Enhanced Signaling Protocol affects billing as follows: if the IP sends a User Program message to the DMS-100 switch and modifies CFW status and destination data, it bypasses the normal call processing interface to the feature, and so it also bypasses CFW activation-related AMA.

### Station Message Detail Recording

SAID Enhanced Signaling Protocol does not affect Station Message Detail Recording.

### Datafilling office parameters

SAID Enhanced Signaling Protocol does not affect office parameters.

### Datafill sequence

The following table lists the tables that require datafill to implement SAID Enhanced Signaling Protocol. The tables are listed in the order in which they are to be datafilled.

#### Datafill tables required for SAID Enhanced Signaling Protocol (Sheet 1 of 2)

Table	Purpose of table
MPCFASTA	Multiprotocol Controller Fast Applications. This table identifies applications that use the MPC fast utility (a fast input/output interface through the MPC). Each application has a tuple in table MPCFASTA. The tuple associates the application name with an MLC.
MPCLSET	Multiprotocol Controller Link Set. This table groups an MPC fast application's MLCs into link sets. Each tuple contains an application name, the link set number for the application, and the list of MLCs in the link set.
CLLI	Common Language Location Identifier. This table defines a unique identifier for the trunk group.

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## SAID Enhanced Signaling Protocol (continued)

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### Datafill tables required for SAID Enhanced Signaling Protocol (Sheet 2 of 2)

Table	Purpose of table
TRKGRP	Trunk Group. This table defines the logical characteristics of the trunk group. The trunk group is type NFA.
TRKSGRP	Trunk Subgroup. This table defines the signaling characteristics of the trunk subgroup.
TRKMEM	Trunk Member. This table defines the physical characteristics of the trunk member.
ASSVLINK	Assisted Service Link. This table associates an NFA trunk member to an MPCLSET index. Messages corresponding to calls over the NFA trunk members datafilled in this table will use the MLCs defined in table MPCLSET.
ASSVFEAT	Assisted Service Features. This table manages IP access to DMS features on a per-feature basis. It also manages what feature data is sent to the IP in call context messages.
SAIDOFC	Speech Activated Intelligent Dialing Optionality. This table controls software optionality for SAID Enhanced Signaling Protocol and NFA SOD. Adding tuples to table SAIDOFC activates these functionalities upon datafill.

### Datafilling table MPCFASTA

For sample datafill for table MPCFASTA specific to SAID Enhanced Signaling Protocol, see the MAP display example for table MPCFASTA in section "Operation." Only those fields that apply directly to SAID Enhanced Signaling Protocol are shown. For more information about the table, refer to the data schema section of this document.

### Datafilling table MPCLSET

For sample datafill for table MPCLSET specific to SAID Enhanced Signaling Protocol, see the MAP display example for table MPCLSET in section "Operation." Only those fields that apply directly to SAID Enhanced Signaling Protocol are shown. For more information about the table, refer to the data schema section of this document.

### Datafilling table CLLI

For more information about datafilling table CLLI, refer to the functionality of Network Facility Access.

### Datafilling table TRKGRP

For more information about datafilling table TRKGRP, refer to the functionality of Network Facility Access.

**SAID Enhanced Signaling Protocol** (continued)

**Datafilling table TRKSGRP**

For more information about datafilling table TRKSGRP, refer to the functionality of Network Facility Access.

**Datafilling table TRKMEM**

For more information about datafilling table TRKMEM, refer to the functionality of Network Facility Access.

**Datafilling table ASSVLINK**

The following table shows the datafill specific to SAID Enhanced Signaling Protocol for table ASSVLINK. For more information about the table, refer to the data schema section of this document.

**Datafilling table ASSVLINK**

Field	Subfield or refinement	Entry	Explanation and action
ASSVLINK		see subfields	Assisted service link. This field names the NFA trunk member with which to associate a link set defined in table MPCLSET. It consists of subfields CLLI and MEMNAME.
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. Enter the NFA trunk name datafilled in tables CLLI, TRKGRP, TRKSGRP, and TRKMEM.
	MEMNAME	numeric (0 to 9999)	Member name. Enter the trunk member number datafilled in table TRKMEM.
MPCAPPLN		ASSVDAT1 ASSVDAT2 ASSVDAT3 ASSVDAT4 ASSVDAT5 ASSVDAT6	MPC application. Enter the name of the application in table MPCLSET that contains the MLC assignment for the trunk member.  <b>Note:</b> If SAID Enhanced Signaling Protocol (AN0831) is deployed in a 100/TOPS Combo software load, only ASSVDAT1 and ASSVDAT2 applications are available.
MPCSET		(0 to 15)	MPC set index. Enter the index of the application in table MPCLSET that contains the MLC assignment for the trunk member.

**Datafill example for table ASSVLINK**

Sample datafill for table ASSVLINK is shown in section "Operation."

**SAID Enhanced Signaling Protocol** (continued)

**Datafilling table ASSVFEAT**

The following table shows the datafill specific to SAID Enhanced Signaling Protocol for table ASSVFEAT. For more information about the table, refer to the data schema section of this document.

**Datafilling table ASSVFEAT**

Field	Subfield or refinement	Entry	Explanation and action
ASSVKEY		alphanumeric	Assisted service key. Enter a valid line option (for example, 3WC or CFW).
CONTEXT		Y or N	Context. Enter Y (yes) if the feature information will be sent on call context.
QUERY		Y or N	Query. Enter Y (yes) if the IP will be able to query the feature.
PROGRAM		Y or N	<p>Program. Enter Y (yes) if the IP will be able to program the line option.</p> <ul style="list-style-type: none"> <li>For RES lines: CFBL, CFDA, CFW, and SCF.</li> <li>For IBN lines: CBE, CBI, CBU, CDE, CDI, CDU, CFB, CFD, CFF, CFI, and CFU.</li> </ul> <p><b>Note:</b> Currently only the following CFW line options are programmable by the IP.</p>

**Datafill example for table ASSVFEAT**

The following example shows sample datafill for table ASSVFEAT.

**MAP display example for table ASSVFEAT**

ASSVKEY	CONTEXT	QUERY	PROGRAM
CFDA	Y	Y	Y
CFW	Y	Y	Y
MWT	Y	Y	N
SCF	N	Y	Y
3WC	Y	Y	N

In this example, five features are datafilled as part of an IP-based service. The CFDA and CFW features are sent as part of a call context message and can be



## SAID Enhanced Signaling Protocol (end)

both queried and programmed by the IP. The MWT and 3WC features are sent as part of a call context message and can be queried, but are restricted from IP write access. The SCF feature is not sent as part of a call context message, but it can be queried and programmed by the IP.

### Datafilling table SAIDOFC

The following table shows the datafill specific to SAID Enhanced Signaling Protocol for table SAIDOFC. Table SAIDOFC controls software optionality for features SAID Enhanced Signaling Protocol (AN0831) and NFA SOD (AN0434). Tuples must be added to this table to activate the functionality of these features.

#### Datafilling table SAIDOFC

Field	Subfield or refinement	Entry	Explanation and action
SAIDOPTN		SAID_SOD ASSV_CONTEXT ASSV_QUERY ASSV_PROGRAM	<i>SAID option</i>  Enter the name of the service to activate.

#### Datafill example for table SAIDOFC

The following example shows sample datafill for table SAIDOFC.

#### MAP display example for table SAIDOFC

SAIDOPTN
SAID_SOD ASSV_CONTEXT

In this example, SOD is allowed. Also, Assisted Service call context messages will be sent, depending on the datafill of tables ASSVFEAT and ASSVLINK. However, Assisted Service query and program request messages will be ignored.

### Translation verification tools

SAID Enhanced Signaling Protocol does not use translation verification tools.

### SERVORD

SAID Enhanced Signaling Protocol does not use SERVORD.

## SAID on MBS

---

### Ordering codes

Functional group ordering code: SAID0001

Functionality ordering code: SAID0005

### Release applicability

DMSCCM04 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

This feature makes Speech Activated Intelligent Dialing (SAID) services available on Meridian business sets (MBS).

### Operation

Operational considerations for SAID on MBS are essentially identical to those for the prerequisite feature, SAID Enhanced Signaling Process, SAID0003. For full operational considerations for this feature, see the documentation for SAID Enhanced Signaling Process.

### Translations table flow

The SAID on MBS translations tables are described in the following list:

- Table AUDPRGM (Automatic Dial Key Program) is used by an operating company to define the digits datafilled on an automatic dial (AUD) key. THE AUD NFA option must be datafilled in table AUDPRGM in order to use an AUD key on the business set to autodial the NFA feature access code.
- Table IBNXLA (IBN Translation) stores the data for the digit translation of calls from an Integrated Business Network (IBN) station, an attendant console, an incoming, or an incoming side of a two-way IBN trunk group. Table IBNXLA contains the SAID explicit feature access code.
- Table KSETFEAT (Business Set and Data Unit Feature) lists the line features that are assigned to the business sets and data units listed in table

**SAID on MBS** (continued)

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KSETLINE (Business Set and Data Unit Line Assignment). SAID on MBS uses this table to assign option NFA to an AUD key.

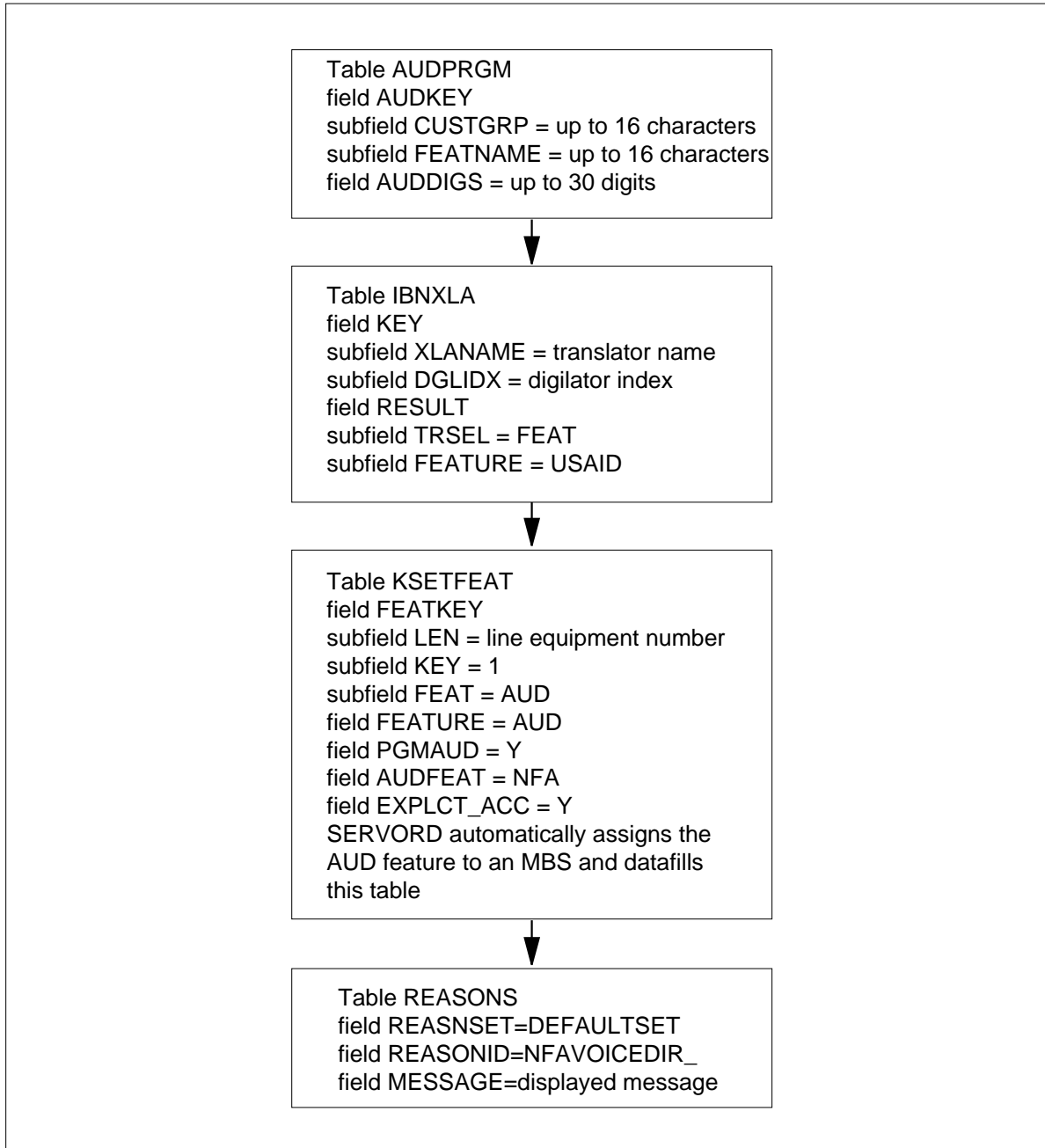
- Table REASONS (Business Set Reason Display) displays various feature and call progress information messages on display electronic telephone sets (ETS).

The SAID on MBS translation process is shown in the flowchart that follows.

## SAID on MBS (continued)

---

Table flow for SAID on MBS



**SAID on MBS** (continued)

The following table lists the datafill content used in the flowchart.

**Datafill example for SAID on MBS**

Datafill table	Example data
AUDPRGM	IBNTST NFA B32
IBNXLA	IBNTST 52 FEAT N N N USAIDIBNTST 53 REPL N 6211000
KSETFEAT	HOST 007 03 21 1 NFA NFA 6215000 Y Y Y Y Y 4221 \$
REASONS	DEFAULTSET NFAVOICEDIR_ VOICE_DIRECTORY \$

**Limitations and restrictions**

The following limitations and restrictions apply to SAID on MBS:

- This feature is limited to explicit or remote access to SAID services. Implicit access to the IP is not allowed.
- When assigning this feature to the business set, the NFA option must be assigned to the primary DN, key 1.
- This feature does not support secondary appearances of multiple appearance DNs (MADN). SERVORD blocks the assignment of the NFA option to a secondary DN.
- This feature does not support automatic call distribution (ACD), uniform call distribution (UCD), and integrated services digital network (ISDN) sets.

**Interactions**

The following paragraphs describe the interactions between SAID on MBS and other functionalities.

**Stringing of Digits**

The Stringing of Digits (SOD) SAID feature is supported to process two digit strings sent from the IP. SOD allows the NFA trunk to dial two digit strings on behalf of the user. In this case, the first string must be a feature access code and the second string must be a DN.

**Activation/deactivation by the end user**

The end user must activate and deactivate SAID on MBS.

## **SAID on MBS (continued)**

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### **Activation/deactivation of SAID on MBS by the user using single key activation**

***At your telephone:***

- 1** User goes off-hook or presses key 1, then presses the AUD feature key, which has been preprogrammed with option NFA.  
Response:  
SAID services are accessed and the DMS switch establishes a voice connection between the user and the IP.
- 2** User voices a request to the IP.  
Response:  
The IP sends the digits required to complete the request to the DMS switch. The user is connected to the called party.
- 3** When call is complete, user presses release or goes on-hook.  
Response:  
Connection is broken.

### **Activation/deactivation of SAID on MBS by the user using feature access code activation**

***At your telephone:***

- 1** User goes off-hook or presses key 1, then dials a feature access code, datafilled in table IBNXLA for each customer group.  
Response:  
SAID services are accessed and the DMS switch establishes a voice connection between the user and the IP.
- 2** User voices a request to the IP.  
Response:  
The IP sends the digits required to complete the request to the DMS switch. The user is connected to the called party.
- 3** When call is complete, user presses release or goes on-hook.  
Response:  
Connection is broken.

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**SAID on MBS** (continued)

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**Activation/deactivation of SAID on MBS by the user using feature access code activation**

*At a remote telephone:*

- 1 User goes off-hook, then dials a direct inward system access (DISA) DN or feature access code to connect to the IP.  
Response:  
User is connected to the IP and prompted to enter an MBS primary DN and a personal identification number (PIN) to access SAID services.
- 2 User enters an MBS primary DN and a PIN.  
Response:  
SAID services are accessed and the DMS switch establishes a voice connection between the user and the IP.
- 3 User voices a request to the IP.  
Response:  
The IP sends the digits required to complete the request to the DMS switch. The user is connected to the called party.
- 4 When call is complete, user presses release or goes on-hook.  
Response:  
Connection is broken.

**Billing**

SAID on MBS follows the existing rules for generating call codes 174 and 175 and module code 047.

**Station Message Detail Recording**

SAID on MBS does not affect Station Message Detail Recording.

**Datafilling office parameters**

SAID on MBS does not affect office parameters.

## SAID on MBS (continued)

### Datafill sequence

The following table lists the tables that require datafill to implement SAID on MBS. The tables are listed in the order in which they are to be datafilled.

#### Datafill tables required for SAID on MBS

Table	Purpose of table
AUDPRGM	Automatic Dial Key Program Table is used by an operating company to define the digits datafilled on an automatic dial (AUD) key.
IBNXLA	IBN Translation Table stores the data for the digit translation of calls from an IBN station, an attendant console, an incoming, or an incoming side of a two-way IBN trunk group.
KSETFEAT	Business Set and Data Unit Feature Table enables an MBS user to assign the AUD key with the NFA option to the business set.  <b>Note:</b> 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.
REASONS	Business Set Reason Display Table stores the characters seen on the business set display.

### Datafilling table AUDPRGM

The following table shows the datafill specific to SAID on MBS for table AUDPRGM. Only those fields that apply directly to SAID on MBS are shown. For a description of the other fields, refer to the data schema section of this document.

#### Datafilling table AUDPRGM (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
AUDKEY		see subfields	<i>Automatic dial key</i>  This field is the key to the table. This field consists of subfields CUSTGRP and FEATNAME.
	CUSTGRP	alphanumeric (1 to 16 characters)	<i>Customer group name</i>  Enter a Meridian Digital Centrex (MDC) customer group name previously datafilled in table CUSTENG.



**SAID on MBS** (continued)

Datafilling table AUDPRGM (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
AUDDIGS	FEATNAME	alphanumeric (1 to 16 characters)	<i>Feature name</i> Enter a feature or service name. A maximum of 16 feature names can be defined at any one time.
		vector of upto 30 digits, *, and #	<i>Automatic dial key digits</i> This field contains the digits that are programmed on an automatic dial (AUD) key in the customer group for the feature. Up to 30 digits are allowed.  The asterisk (*) character is allowed as the first character entered in this field, if field FEATNAME does not contain the entry STD. * is represented by the alphabetic character b in the DMS-100 switch.  The # sign is represented by the alphabetic character c.

**Datafill example for table AUDPRGM**

The following example shows sample datafill for table AUDPRGM.

**MAP display example for table AUDPRGM**

	AUDKEY	AUDDIGS
IBNTST	NFA	B32

**SAID on MBS** (continued)**Datafilling table IBNXLA**

The following table shows the datafill specific to SAID on MBS for table IBNXLA. Only those fields that apply directly to SAID on MBS are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table IBNXLA (Sheet 1 of 2)**

<b>Field</b>	<b>Subfield or refinement</b>	<b>Entry</b>	<b>Explanation and action</b>
KEY		see subfields	Key. This field consists of subfields XLANAME and DGLIDX.
	XLANAME	alphanumeric (1 to 8 characters)	Translator Name. This subfield specifies the name that is assigned to the translator.
	DGLIDX	9, C, or F	Digitator index. This subfield specifies the digit or digits assigned as an ambiguous code.
RESULT		see subfield	Result. This field consists of subfield TRSEL.
	TRSEL	FEAT, REPL	Translations selector. This subfield specifies the translations selector to be used. If subfield TRSEL=FEAT, subfields ACR, SMDR, VCDR, and FEATURE require datafill. If subfield TRSEL=REPL, subfields CONTINUE, REPLCODE, OPTION, and RCNAME require datafill.
	ACR	Y or N	Account code entry. This subfield whether an account code is required.
	SMDR	Y or N	Station message detail recording. This subfield specifies whether SMDR is required.
	VCDR	Y or N	Variable call detail recording. This subfield specifies whether VCDR is required.
	FEATURE	USAID	Feature. This subfield specifies which feature to start when more than one feature is assigned to a DISA DN.

**SAID on MBS** (continued)

Datafilling table IBNXLA (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	CONTINUE	Y or N	<i>Continue</i> Enter Y (yes) if translation continues with the next translator in the normal sequence. Enter N (no) if translation does not continue but restarts from the beginning based on the user's network class of service (NCOS) and customer translator (as if the user has dialed the replaced digits).
	REPLCODE	numeric (1 to 16 digits)	<i>Replacement code</i> Enter the digit or digits that replace the digits dialed.
	OPTION	RC	<i>Option</i> Enter RC if a new routing characteristic is required for ISDN retranslation and datafill refinement RCNAME.
	RCNAME	alphanumeric (1 to 8 characters)	<i>Routing characteristics name</i> Enter the RC name defined in table RCNAME.

**Datafill example for table IBNXLA**

The following example shows sample datafill for table IBNXLA.

**MAP display example for table IBNXLA**

KEY	RESULT
IBNTST 52	FEAT N N N USAID
IBNTST 53	REPL N 6211000

## SAID on MBS (continued)

### Error messages for table IBNXLA

The following error message applies to table IBNXLA.

#### Error message for table IBNXLA

Error message	Explanation and action
WARNING: if using a carrier with a 4-digit CIC 15-digit international calls may not complete with more than 3 IBN prefix digits.	This message is displayed if more than three IBN prefix digits are used for 15-digit international calls.

### Datafilling table REASONS

The following table shows the datafill specific to SAID on MBS for table REASONS. Only those fields that apply directly to SAID on MBS are shown. For a description of the other fields, refer to the data schema section of this document.

#### Datafilling table REASONS

Field	Subfield or refinement	Entry	Explanation and action
REASNSET		DEFAULTSET	<i>Reason set</i> The name of the reason set for SAID on MBS is DEFAULTSET.
REASONID		NFAVOICEDIR_	<i>Reason identification</i> The name of the reason for SAID on MBS is NFAVOICEDIR_.
MESSAGE		alphanumeric (up to 15 characters)	<i>Displayed message</i> Enter a descriptive message for the option being programmed. Enter an underscore between words to insert a blank space between words. The underscore does not appear on the display. The default message for SAID on MBS is VOICE_DIRECTORY.

### Datafill example for table REASONS

The following example shows sample datafill for table REASONS.

**SAID on MBS** (continued)**MAP display example for table REASONS**

REASNSET	REASONID	MESSAGE
DEFAULTSET	NFAVOICEDIR_	VOICE_DIRECTORY \$

**Translation verification tools**

SAID on MBS does not use translation verification tools.

**SERVORD**

SAID on MBS uses **SERVORD** to assign this feature to key 1 of the MBS.

**SERVORD limitations and restrictions**

The following **SERVORD** limitations and restrictions apply to SAID on MBS:

- The response to the **IMPLCT\_ACC** prompt must be N for MBS.
- When assigning this feature to the business set, the NFA option must be assigned to the primary DN, key 1.

**SERVORD prompts**

The following table shows the **SERVORD** prompts used to assign SAID on MBS to a Meridian business set.

**SERVORD prompts for SAID on MBS (Sheet 1 of 2)**

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. Enter the DN or LEN.
OPTION	NFA	Indicates the name of the option. Enter NFA for SAID on MBS.
OPTKEY	1	Indicates the key on an MBS to which an option is assigned. Enter 1 for SAID on MBS.
USR_ID	1-10 digits	The user ID for the line to which the NFA option is added. The default is the 7-digit ANI of the line (NXX + xxxx).
IMPLCT_ACC	N	Specifies whether the line is allowed implicit access. Enter N for SAID on MBS.
EXPLCT_ACC	Y or N	Specifies whether the line is allowed explicit access. Default is Y.

**SAID on MBS** (continued)

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**SERVORD prompts for SAID on MBS (Sheet 2 of 2)**

Prompt	Valid input	Explanation
AMA_EXPLCT	Y or N	Controls the AMA record generation following an explicit connection. Default is N.
AMA_IPDIAL	Y or N	Controls the AMA record generation following an IP dialed call. Default is N.
REM_ACC	Y or N	Specifies whether the line is allowed remote access. Default is N.
AMA_REM	Y or N	Controls the AMA record generation following a remote connection. This prompt appears if REM_ACC is Y.
NFRAPIN	2 to 10 numeric digits	The remote access PIN. This prompt appears if REM_ACC is Y.

**SERVORD example for adding SAID on MBS**

The following SERVORD example shows how SAID on MBS is added to a business set using the ADO command. This example shows NFA being assigned to an existing line that will be assigned remote access to NFA. This line is given explicit access.

**SAID on MBS (end)****SERVORD example for SAID on MBS in prompt mode**

```

>ADO
SONUMBER:      NOW  92  8  31  AM
>
DN_OR_LEN:
>6215001
OPTKEY:
>1
OPTION:
>NFA
USR_ID: 6215001
>
IMPLCT_ACC: Y
>N
EXPLCT_ACC: Y
>Y
AMA_EXPLCT: N
>Y
AMA_IPDIAL: N
>Y
REM_ACC: N
>Y
AMA_REM
>Y
NFRAPIN
>654321
OPTKEY:
>$

```

**SERVORD example for SAID on MBS in no-prompt mode**

```

>ADO $ 6215005 1 NFA $ N Y Y Y Y Y 654321 $

```

## SAID Universal Access

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### Ordering Codes

Functional group ordering code: SAID0001

Functionality ordering code: SAID0004

### Release applicability

DMS100C03 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

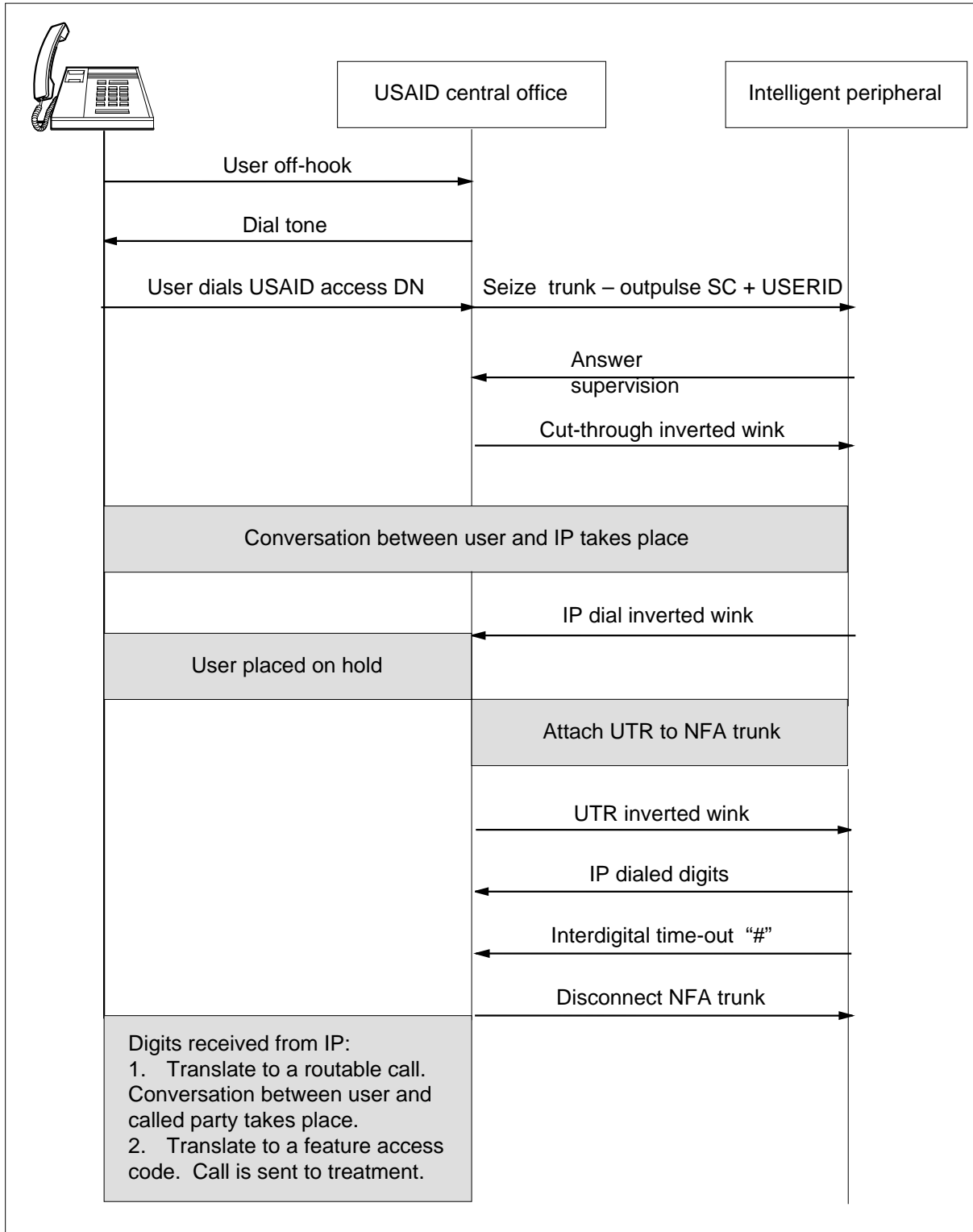
This feature gives end users the ability to provide public access to Speech Activated Intelligent Dialing (SAID) services. This access is provided by the USAID option applied to Direct Inward System Access (DISA) directory numbers (DN). This option allows DISA DNs to be used as Universal Speech Activated Intelligent Dialing (USAID) DNs. There is no restriction on the sets that originate calls to the USAID DN. Calls do not have to originate on the same switch as the USAID DN.

Flexible billing is provided for this feature. The datafill of each DISA DN used for USAID access specifies if AMA records should be generated per access or for intelligent peripheral (IP) dialing. Furthermore, records can bill the calling party, or the USAID access DN when used as a special billing number.

This feature is based on the protocol set out in the SAID Network Interface Specification for explicit connections to intelligent peripherals (IP). The following figure shows an example of a typical USAID where the call originates on the same switch as the USAID access DN.



**SAID Universal Access** (continued)



## SAID Universal Access (continued)

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### Operation

Automatic Number Identification (ANI) must be available for this feature to function. If subfield ANI\_FAIL\_USE\_DISA in table DNROUTE is set to N and ANI is not available, the call is routed to a treatment. However, if this field is set to Y, then the call continues. If any of the subfields AMA\_CONNECT, AMA\_DIAL, or USERID in this table are set to CALLER, they will process as though they were set to DISA DN.

USAID utilizes existing DISA functionality to provide a USAID DN. The DISA directory numbers used for USAID are datafilled in table DNROUTE. For each directory number (DN) to be used with DISA, a tuple must be specified in table DNROUTE. The DISA attributes that must be specified are customer group, customer subgroup, whether DISA authorization is required, whether SMDR billing applies, whether DISA intragroup calls are allowed, and which DISA options are associated with the DN.

This feature implements a DISA option called USAID. Option USAID indicates that the DISA DN is used for generic access to SAID services. Datafill USAID for the DISA option in field DISAOPT in table DNROUTE.

The following additional subfields must also be specified for the USAID option:

- AMA\_CONNECT
- AMA\_DIAL
- USERID
- FORW\_ANI
- ANI\_FAIL\_USE\_DISA

### Table DNROUTE USAID fields

The following paragraphs describe the table DNROUTE fields utilized by USAID. The generation of call codes 174 and 175 is intended to be used for statistical purposes, not to bill the user. Refer to "Limitations and Restrictions" in this feature description for more information.

#### **AMA\_CONNECT**

Subfield AMA\_CONNECT determines if an automatic message accounting (AMA) call code 174 record with the module code 047 appended is generated for USAID access and to what party such a record is billed.

In this case, the access method field of the module code 047 is set to "No previous IP Access" and call code 174 is generated only for calls that complete a SAID explicit connection. An explicit connection is considered complete

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**SAID Universal Access** (continued)

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when the caller is connected to a network facility access (NFA) trunk and answer supervision is received back from the IP. The AMA record is generated after the call is finished. This occurs when the user goes on-hook or the IP has finished dialing a number for the user. Subfield `AMA_CONNECT` may be set to `NONE`, `CALLER`, or `DISA_DN`. A value of `NONE` indicates that call code 174 is not generated. The values of `CALLER` and `DISA_DN` both cause a 174 call code to be generated and indicate billing to the calling party (setting of `CALLER`) or the DISA DN (setting of `DISA_DN`). This subfield is detailed more fully in the "Billing" section of this feature description.

**AMA\_DIAL**

Subfield `AMA_DIAL` indicates if an AMA call code 175 record with the module code 047 appended should be generated when the IP extends a call for the user. The call code 175 is generated after an IP extended call has completed (that is, one of the parties goes on-hook). If specified, this record is generated and the module code 047 is appended to the record that is generated, only when no other billing is generated for the call.

In this case, the access method field of the module code 047 is set to "Remote." `AMA_DIAL` may be set to `NONE`, `CALLER`, or `DISA_DN`. A value of `NONE` indicates that call code 175 is not generated. The values of `CALLER` and `DISA_DN` both cause call code 175 to be generated and indicate it is to be billed to the calling party or the DISA DN respectively.

Subfield `AMA_DIAL` also determines the behavior of USAID when a local caller (a phone on the same switch as the USAID access DN) causes the IP to extend a call to a long distance number. If subfield `AMA_DIAL` is set to `CALLER`, any additional billing records generated for long distance access are billed to the caller. Otherwise, they are billed to the `DISA_DN`. Calls placed by remote callers (those calling from another switch in the network) always have IP extended toll calls billed to the `DISA_DN`. This subfield is detailed more fully in the "Billing" section of this feature description.

**USERID**

Subfield `USERID` determines the SAID user identification that is sent to the IP. This subfield can be set to either `CALLER` or `DISA_DN`. Specifying `CALLER` causes the calling line identification (CLID) of the originator to be sent to the IP as the SAID user identification. `DISA_DN` causes the DISA DN to be used. When `CALLER` is specified and CLID blocking is in effect, an alternate service code is sent to the IP. This service code is datafilled in table `CUSTSTN` and is called the `USAID_CLID_BLK_SC`.

This subfield only affects what is sent to the IP as the user identification in the standard SAID explicit protocol. This subfield does not change what a called party receives if they subscribe to a CLID display service. If the called party

## **SAID Universal Access** (continued)

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normally receives the CLID of the caller, then the caller's CLID will still be displayed.

### **FORW\_ANI**

Subfield FORW\_ANI determines the SAID user identification that is used when CLID is not available. If CLID is not available and FORW\_ANI is set to Y, ANI is sent to the IP as the user identification. If CLID is not available and FORW\_ANI is N, a string of dual-tone multifrequency (DTMF) signaling digits is sent to the IP. The string of digits are asterisks (\*). The length of this string is determined by the setting of USERID\_LEN in table CUSTSTN. In all cases if ANI is not available, the call is handled according to the subfield ANI\_FAIL\_USE\_DISA.

### **ANI\_FAIL\_USE\_DISA**

Subfield ANI\_FAIL\_USE\_DISA determines the behavior of USAID when ANI and CLID are not available. When CLID and ANI are not available, and ANI\_FAIL\_USE\_DISA is set to N, the call is routed to treatment. If CLID and ANI are not available and this subfield is Y, then the call is completed as though any field set to caller AMA\_CONNECT, AMA\_DIAL, or USERID are set to DISA DN.

## **USAID Call Processing Capabilities**

A USAID session begins when a call terminates to a USAID DISA DN. This can occur when the caller dials the DISA DN directly, when a call is translated to the DISA DN either by the local switch, or when a remote switch sends the DISA DN as the called number.

If USAID is the only feature allowed on the DISA DN, the digital multiplex system (DMS) switch activates the USAID feature upon termination. Datafill USAID for the DISA option in field DISAOPT in table DNROUTE. If ANI spill fails and the subfield ANI\_FAIL\_USE\_DISA is set to N, the call is routed to a treatment. Otherwise, USAID attempts to establish a connection to an NFA trunk.

This is done using explicit SAID protocol. First, the DMS switch seizes an idle member from the trunk group specified in the customer group's USAID tuple in table CUSTSTN. The DMS switch then outputpulses the USAID service code datafilled. If CLID blocking is in effect, subfield USAID\_CLID\_BLK\_SC in table CUSTSTN is used as the service code. Next, a user identification is outputpulsed. The code outputpulsed to the IP depends on subfields USERID and FORW\_ANI of the USAID DN in table DNROUTE as well as the presence of CLID and CLID blocking. If the NFA trunk resources are not available, the call is sent to a treatment.

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**SAID Universal Access** (continued)

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Next the IP sends answer supervision back on the NFA trunk to the DMS switch and the connection is completed. If the IP fails to answer within a time datafilled in the trunk group's data, the trunk connection is dropped and the subscriber is sent to a treatment. If the subscriber goes on-hook at any point through this process, the DMS switch disconnects the NFA trunk and drops the call. If cut-through occurs, however, an inverted wink is sent by the DMS switch on the NFA trunk. At this point, a call is established between the caller and the IP. No dial pulse (DP) to DTMF signaling conversion is provided.

The call between the caller and the IP remains in place until one of the following events occur:

- The caller performs a flash-hook.

This can occur if the line being used by the caller has been assigned the flash-hook hold capability. If the caller uses the flash-hook and the line that the caller is using is on the same switch as the DISA DN, the IP is placed on hold. If the originator's line is on a different switch in the network, the terminating switch with the DISA DN is not aware of the action since the flash is not propagated through the network. The connection between the NFA trunk from the terminating office and the IP remains in place as if nothing had happened.

- The caller goes on-hook.

If this occurs, the part of the call between the originator and the NFA trunk is disconnected. If datafill supports it, an AMA record with call code 174 can be generated, if the IP has answered, and the universal connection that was established between the caller is recorded.

- The IP goes on-hook.

If this occurs, the part of the call between the originator and the NFA trunk is disconnected. An AMA record with call code 174 can be generated, if datafilled supported, and the universal connection that was established between the caller and the NFA trunk will be recorded.

- The IP returns an inverted wink.

This indicates that the IP intends to dial a routing number for the subscriber. At this point, the DMS switch receives digits from the IP as specified in the existing protocol for IP dialing. Once the end of digits indication is received, the NFA trunk connection to the IP is disconnected and an AMA record with call code 174 can be generated, if datafilled supported, and the universal connection that was established between the caller and the IP is recorded.

A USAID session can continue when the digits transmitted by the IP are received properly. The DMS switch translates them to determine whether or

## **SAID Universal Access** (continued)

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not the IP has attempted to dial a feature access code. If the digits indicate a feature access code, the DMS switch sends the call to FEATURE\_NOT\_ALLOWED treatment. If the digits will translate to a regular line or trunk connection, then the DMS switch attempts to place the call.

The translation of digits dialed by the IP is based on the customer group, subgroup, and network class of service (NCOS) specified in table DNROUTE (tuple for the USAID DN). The call is placed as though a user in the USAID DN's customer group had dialed the call.

### **Translations table flow**

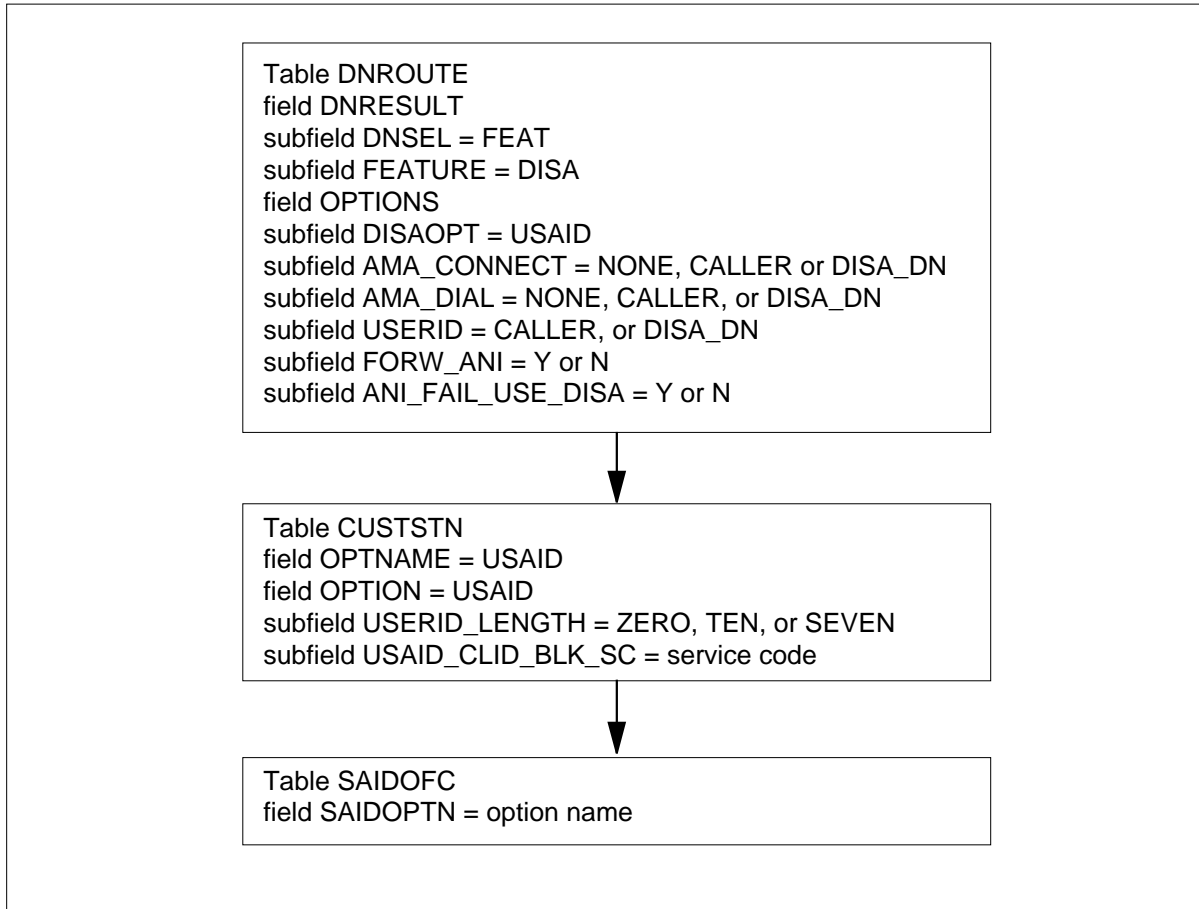
The SAID Universal Access translations tables are described in the following list:

- Table CUSTSTN lists the station options assigned to each of the customer groups defined in the switch.
- Table DNROUTE lists information for DNs in the switch such as a DN that identifies a route, rather than a line equipment number (LEN). This table also associates a DN with a specific trunk group member.
- Table IBNXLA provides the name of the feature and option associated with a feature access code.
- Table SAIDOFC controls software optionality for SAID ESP and NFA SOD.

The SAID Universal Access translation process is shown in the flowcharts that follow.

**SAID Universal Access** (continued)

**Table flow for normal SAID Universal Access**

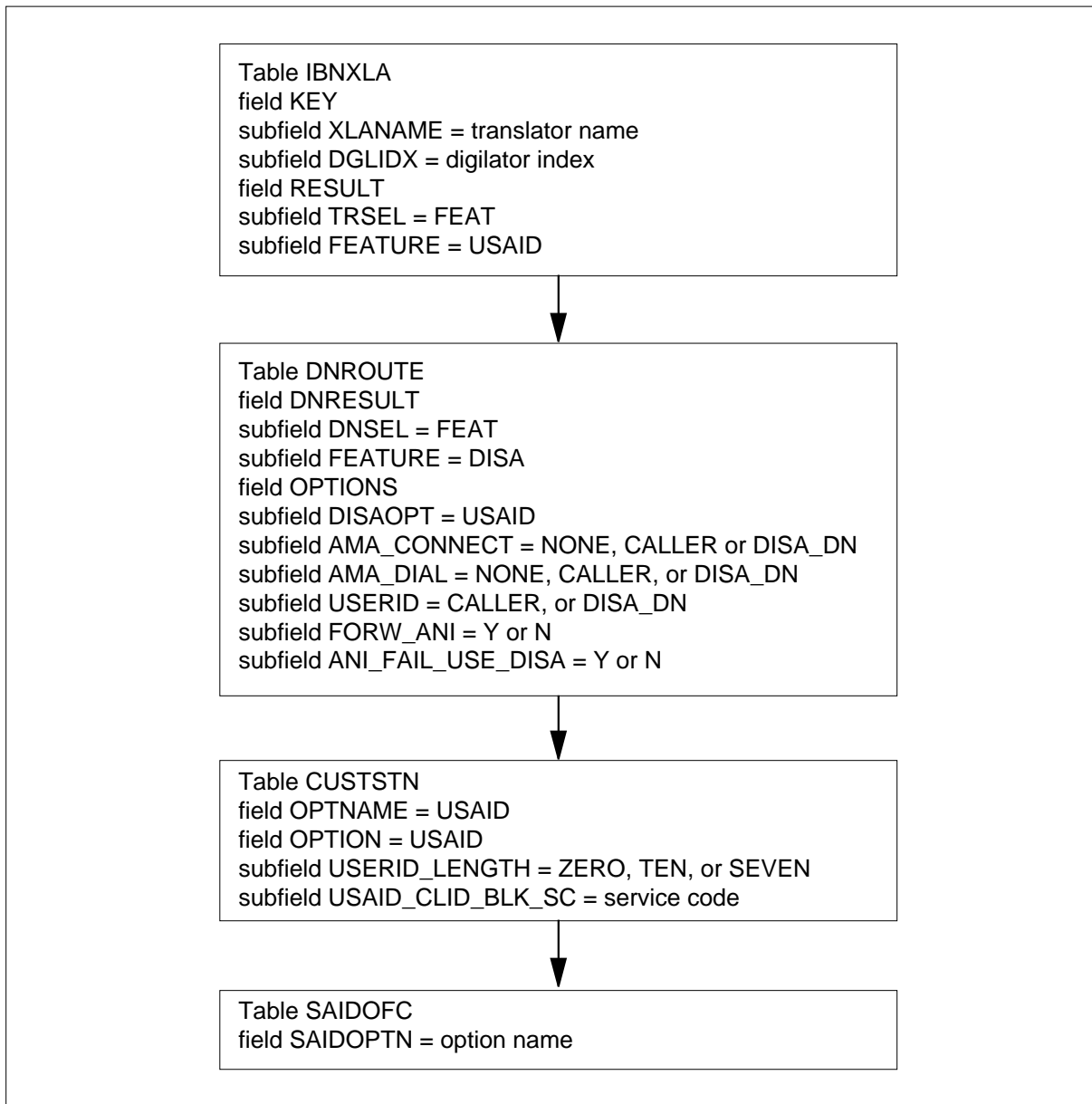


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## SAID Universal Access (continued)

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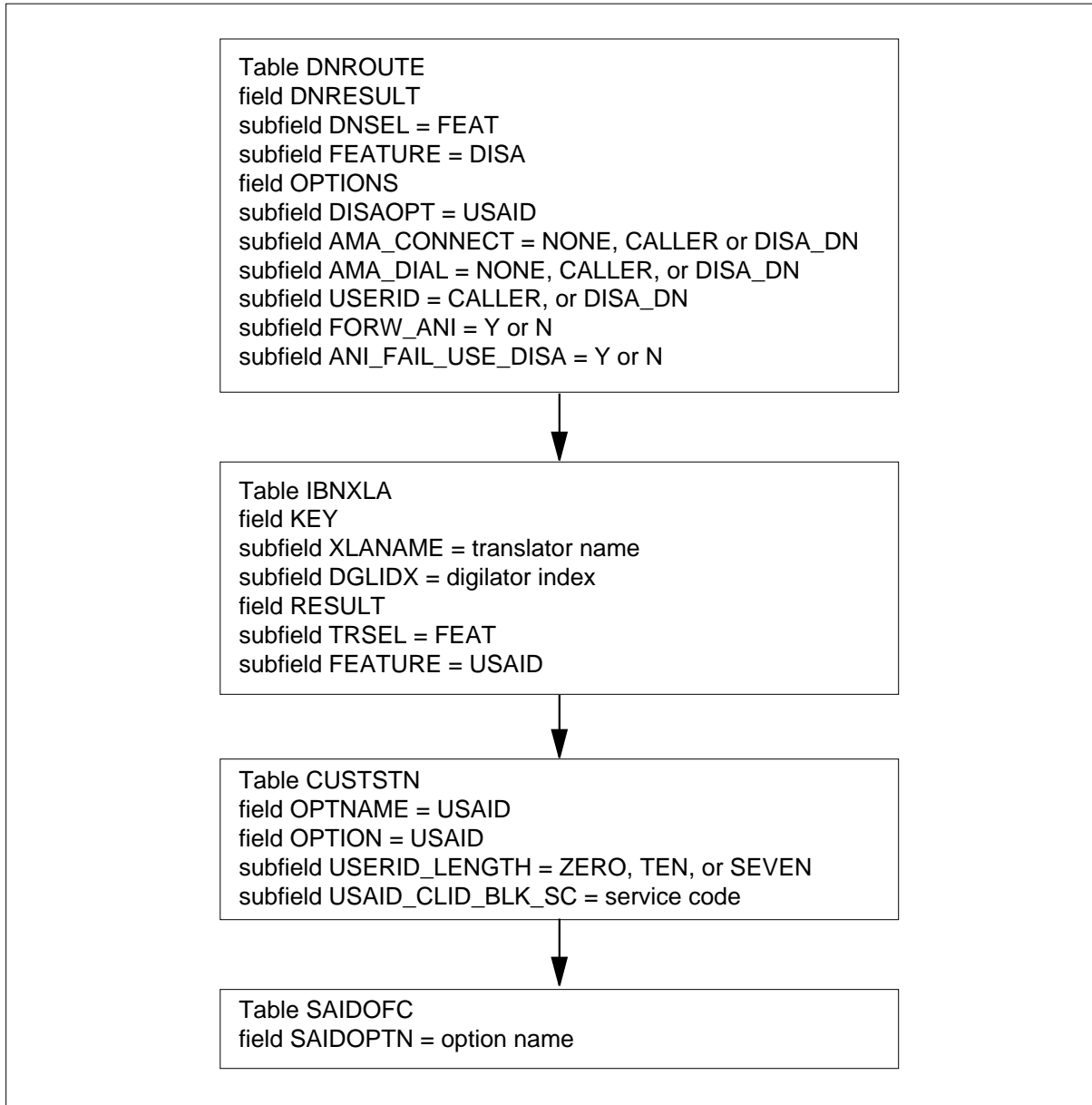
Table flow for FAC SAID Universal Access





**SAID Universal Access** (continued)

**Table flow for FAC SAID Universal Access, multiple features on DISA DN**



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## SAID Universal Access (continued)

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The following table lists the datafill content used in the flowcharts.

### Datafill example for SAID Universal Access

Datafill table	Example data
CUSTSTN	IBNTST USAID USAID USAIDTRKG 999 TEN 6
DNROUTE	613 621 1000 FEAT DISA IBNTST 0 N N N Y USAID CALLER CALLER DISA_DN N Y
IBNXLA	IBNTST 52 FEAT N N N USAIDIBNTST 53 REPL N 6211000
SAIDOFCC	SAID_SOD ASSV_CONTEXT

### Limitations and restrictions

The following limitations and restrictions apply to SAID Universal Access:

- The assignment of USAID to a DISA DN with additional features is supported, but not recommended.
- Any incoming trunks to a USAID DN must spill an ANI. For applications where the caller's ANI is required for correct operation, incoming trunks must spill an ANI and not a special billing number. If ANI fails, then the call is routed to the NO\_SOFTWARE\_RESOURCE treatment unless the ANI\_FAIL\_USE\_DISA subfield in table DNROUTE is set to Y.
- For incoming SS7 trunks, USAID accepts the Charge Number as the billing number. The presence or absence of Charge Number is equated with ANI when determining USAID behavior. If ANI (charge number and or calling party address) is not received, then USAID routes the call to treatment unless ANI\_FAIL\_USE\_DISA is set to Y.
- To Support ANI from cellular offices, feature group D (FGD) signalling is required on trunks terminating to a USAID office. This applies to PTS by way of VAPN trunks.
- For PTS VAPN trunks, if ANI fails, then the call is routed to a treatment. AMA\_CONNECT and AMA\_DIAL are never reached.
- IP dialed numbers are translated based on the customer group, subgroup, and the optional NCOS datafilled for the USAID DN, not on the DN of the caller. If no NCOS option is datafilled, the external NCOS of the customer group is used. This affects the creation of IP services.
- The IP can only dial routing DNs. Any attempt to dial feature activation codes, including speed call activations and features defined in table IBNXLA, is not allowed.

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**SAID Universal Access** (continued)

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- Billing inconsistencies can arise when call codes 174 and 175 generated by a USAID access DN are used to bill the user rather than for statistical measures. Inconsistencies are also possible if attempts are made to bill USAID enabled long distance calls to the user rather than the DISA DN.
- If call codes 174 or 175 are used to bill a user for USAID service usage, a caller making a local call to the DISA DN directly from a pay phone would not be charged for the call or any generated long distance. AMA records would be generated against the pay phone's DN but the user would not be requested to insert additional coins to pay for this service.
- Extended calls are made using the USAID DNs translations and line information; therefore, a caller may make a local call to the DISA DN, then make extended toll calls even if the user's DN has toll blocking. In addition, the user cannot be billed for the extended USAID toll call.
- For Meridian Digital Centrex (MDC) and private branch exchange (PBX) end users using a single special billing number, multiple billing records could occur if the ANI of the original caller is received instead of the special billing number. In addition, these multiple records would be generated against the business' individual DNs. Attempts to make USAID extended toll calls would be possible, as described in the bullet above.
- Call codes 174 and 175 and module code 047 are only applicable if the call is answered. For the USAID access case, this means that the IP connection is completed, that is, the DMS switch received answer supervision from the IP and is able to set up the two-way voice path between the subscriber and the IP. For the IP dialed case, this means that the party dialed by the IP answered the call.

## Interactions

The following paragraphs describe the interactions between SAID Universal Access and other functionalities.

### Advanced Intelligent Network

USAID supports Advanced Intelligent Network (AIN) triggers. The NFA and AIN line options can be assigned to the same line through SERVORD. For more information on SAID/AIN interworking, including limitations and restrictions, see Network Switching Systems NA004 AIN0.1, PLN-5161-351.

### Call Transfer

A user is not allowed to transfer a connection to an IP that was made through a USAID to another party. It is possible, though, to transfer a "remote" USAID connection to an IP that was originated in a different switch from USAID DN.

## **SAID Universal Access** (continued)

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For example, line A forms a three-way call between line B and a USAID connection in another office. The "remote" USAID connection is established by dialing a USAID DISA DN associated with an office other than line A's office. If line A has call transfer capabilities, line A can transfer line B to the USAID IP connection. AMA records generated for any calls extended by the IP on this connection are charged to the calling party (line A) which originally established the USAID connection.

### **Call Waiting**

When a subscriber is connected to the IP with SAID Universal Access, the DMS ignores the "IP dial" if Call Waiting is active (the IP is not allowed to dial). However, when Call Waiting is active, the subscriber can still switch between the IP connection and the incoming call by flashing. Once the Call Waiting becomes inactive, the DMS can recognize the "IP dial" from the IP and the IP can initiate dialing.

### **DSCWID**

USAID is compatible with the Deluxe Spontaneous Call Waiting Identification (DSCWID) feature; however, the following interactions apply when the DSCWID subscriber with NFA is connected to the IP:

- If the DSCWID subscriber is connected to the IP explicitly and another call arrives, the subscriber may flash to receive that call; however, the connection to the IP may drop depending on the IP's configuration.
- If the DSCWID subscriber is connected to the IP explicitly and the IP is currently dialing a number for the subscriber, there are no alerting tones.
- A DSCWID subscriber connected to the IP implicitly will not receive alerting tones at any time during the implicit connection.

### **Feature Access Code**

An end user can start the USAID feature by dialing an FAC assigned to a USAID DN, or by using the REPL feature in table IBNXLA.

### **Three-Way Calling**

A user may not use three-way calling to conference two USAID established IP connections together. This does not apply to conferencing together two calls extended by the IP or to conferencing an IP extended call with an IP connection.

It is possible, however, to establish a call that includes two IP connections through USAID if call chaining is used. For example, line A and line B both have three-way calling. Line A calls line B, then both lines A and B add a USAID connection to their respective second call legs. When A and B are conferenced back together, the call chain includes two IP connections.

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**SAID Universal Access** (continued)

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It is also possible to establish a call that includes two IP connections if either of the connections to a USAID DN are in another office. For example, line A dials a USAID access DN and then puts the connection on hold. Line A then dials a USAID access DN in another office and conferences both legs of the call together. At this point a three-way call with two IP connections is established.

**USAID Processing of CLID and ANI**

USAID is transparent to current Calling Line Identification (CLID) delivery. Datafill determining what will be delivered to the IP as a SAID user identification does not affect what a called party sees on IP extended calls.

**15-Digit International Dialing**

SAID Universal Access supports 15-digit international dialing.

**Activation/deactivation by the end user**

SAID Universal Access requires no activation or deactivation by the end user.

**Billing**

USAID follows the existing rules for generating call codes 174 and 175 and module code 047, with some variation in the data. The data generated is controlled through the table DNROUTE tuple for USAID DN and specifies if the generation of AMA records occurs for IP connect and for IP dialing. This is flagged by the values stored in subfields AMA\_CONNECT and AMA\_DIAL. See the table entitled "USAID AMA field matrix" for an overview of the influence of these two fields.

It is possible to indicate which party is billed for a USAID call. This is also controlled by the values of subfields AMA\_CONNECT and AMA\_DIAL. To turn on AMA generation, these fields are set to CALLER or DISA\_DN. Using

**SAID Universal Access** (continued)

these values causes the AMA records to be billed against the calling party's ANI (CALLER) or the DISA\_DN (DISA\_DN).

*Note:* When one of these fields is set to CALLER and ANI is not available, the call defaults to the specifications indicated for DISA\_DN if ANI\_FAIL\_USE\_DISA is set to Y in table DNROUTE.

**USAID AMA field matrix**

Field	Value of field	AMA record generated	Value in originating NPA and DN of AMA record
AMA_CONNECT	NONE	none	n/a
AMA_CONNECT	CALLER	code 174	calling party's ANI (Note)
AMA_CONNECT	DISA_DN	code 174	USAID DISA DN
AMA_DIAL	NONE	none	n/a
AMA_DIAL	CALLER	code 175	calling party's ANI (Note)
AMA_DIAL	DISA_DN	code 175	USAID DISA DN
<b>Note:</b> Defaults to DISA DN if ANI is not present and ANI_FAIL_USE_DISA is set to Y.			

**Other AMA generation matrix**

Field	Value of field	AMA record generated	Additional AMA is billed to:
AMA_DIAL	NONE	none	calling party's ANI (Note)
AMA_DIAL	CALLER	code 174	calling party's ANI (Note)
DISA DN	DISA DN	code 175	DISA DN
<b>Note:</b> Defaults to DISA DN if ANI is not present and ANI_FAIL_USE_DISA is set to Y.			

**Subfield AMA\_CONNECT**

If subfield AMA\_CONNECT is *not* set to NONE, then call code 174 with module code 047 appended is generated for each completed access to the IP. The access method field of module code 047 is set to NO\_PREVIOUS\_IP\_CONNECTION. The call code 174 is generated only for calls that complete a SAID explicit connection.

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**SAID Universal Access** (continued)

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An explicit connection is considered complete when the caller is connected to an NFA trunk and answer supervision is received back from the IP. The record is generated after the call is finished, which is when the user goes on-hook or the IP has finished dialing a number for the user.

This field may also be set to CALLER or DISA\_DN. The values of CALLER and DISA\_DN both cause a call code 174 record to be generated, and indicate that it is to be billed to the calling party or the DISA DN respectively.

**Subfield AMA\_DIAL**

If subfield AMA\_DIAL is *not* set to NONE, for IP extended calls, call code 175 with module code 047 appended is generated. All module codes of 047 generated by the USAID feature have the access method set to "Non-subscribed access." Module code 047 is always appended to call codes 174 or 175 by this feature and not to other billing records.

Any billing records other than call codes 174 and 175 triggered by a USAID call, generate with the billed party for these records depending upon the setting of subfield AMA\_DIAL. When subfield AMA\_DIAL is set to CALLER or NONE, all additional records are billed to the caller. For calls with AMA\_DIAL set to DISA\_DN, records are billed to the DISA DN.

**AMA processing example one**

The following paragraphs provide a call scenario to further illustrate the functions of this feature. In this example, the datafill for the USAID DN in table DNROUTE is subfield AMA\_CONNECT equals CALLER and subfield AMA\_DIAL equals CALLER.

The user begins by dialing the USAID access DN and a complete connection is established to the IP. A complete connection means that the user is connected to an NFA trunk and answer supervision has been received from the IP.

The user then holds a conversation with the IP and the call is extended. Upon completion of IP dialing, an AMA record with call code 174 is generated with module code 047 appended. The originating NPA and DN of the 174 record is propagated with the ANI of the user (this is specified by the AMA\_CONNECT subfield set to CALLER). The IP-dialed digits then translate to a routable number and a connection is established between the user and the called party.

The called party answers and a conversation takes place between the originating user and the called party. The call is considered completed when either the user or the called party goes on-hook. At that point, an AMA record with call code 175 is generated with module code 047 appended. This records

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**SAID Universal Access** (continued)
 

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the IP dialing a call and is enabled by the AMA\_DIAL setting. The originating NPA and DN of the AMA record are propagated with the ANI of the user (this is specified by the AMA\_DIAL subfield that is set to CALLER). If the IP-placed call would normally have generated other AMA records, these are also created.

In the three examples that follow, subfield AMA\_CONNECT equals CALLER and subfield AMA\_DIAL equals CALLER. Refer to the previous AMA processing scenario. The following figure is an example of an AMA record generated for call code 174.

**Call code 174**

```

HEX ID:AA STRUCTURE CODE:40001C CALL CODE:174C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C DATE:40521C 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:6215015C OVERSEAS IND:1C TERM NPA:00613C TERM
NUMBER:6211201C CONNECT TIME:1335513C ELAPSED
TIME:000000051C MODULE CODE:047C SERV CODE:00088C ACCESS:0C
SUBSCR ID:00006215015C CONV REQ:1C MODULE CODE:000C
  
```

The following figure is an example of an AMA record generated for call code 110 (terminating access record).

**Call code 110**

```

HEX ID:AA STRUCTURE CODE:00625C CALL CODE:110C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C DATE:40521C TIMING IND:00000C STUDY
IND:0000000C CLD PTY OFF-HK:0C SERVICE OBSERVED:0C OPER
ACTION:0C SERVICE FEATURE:000C ORIG NPA:613CORIG
NUMBER:6215015C OVERSEAS IND:0C TERM NPA:00513C TERM
NUMBER:6215010C CONNECT TIME:1336013C ELAPSED
TIME:000000237C IC/INC PREFIX:00613C CC DATE:40521C CC
TIME:1335584C ELAPSED CC:000000266C IC/INC EVENT
STATUS:010C TRUNK GROUP NUMBER:40638C ROUTING
INDICATOR:1C DIALING INDICATOR:FF ANI INDICATOR:1C
  
```

The following figure is an example of an AMA record generated for call code 175.



**SAID Universal Access** (continued)**Call code 175**

```

HEX ID:AA STRUCTURE CODE:40001C CALL CODE:175C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C DATE:40521C 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:6215015C OVERSEAS IND:0C TERM NPA:00513C TERM
NUMBER:6215010C CONNECT TIME:1336015C ELAPSED
TIME:000000227C MODULE CODE:047C SERV CODE:00088C
ACCESS:4C SUBSCR ID:00006215015C CONV REQ:1C MODULE
CODE:000C

```

**AMA processing example two**

The following paragraphs provide a call scenario to further illustrate the functions of this feature. In this example, the datafill for the USAID DN in table DNROUTE is subfield AMA\_CONNECT equals NONE and subfield AMA\_DIAL equals DISA\_DN.

The user begins by dialing the USAID access DN. A complete connection is established to the IP. The user then holds a conversation with the IP and the call is extended for the user. Call code 174 is generated upon completion of IP dialing since the AMA\_CONNECT setting is not enabled. The IP-dialed digits translate to a routable number and a connection is established between the user and the called party. The called party answers and a conversation takes place between the originating user and the called party. The call is considered completed when either the user or the called party go on-hook.

At this point, an AMA record with call code 175 is generated with module code 047 appended. This record relates to the IP dialing a call. It is enabled by the AMA\_DIAL setting. The originating NPA and DN of call code 175 is propagated with the USAID DISA DN (this is specified by subfield AMA\_DIAL set to DISA\_DN). If the IP-placed call would normally have generated any other AMA records, these are unaffected by USAID and are created as usual.

In the three examples that follow, subfield AMA\_CONNECT equals NONE and subfield AMA\_DIAL equals DISA\_DN. Refer to the previous AMA processing scenario. The following figure is an example of an AMA record generated for call code 110 (long distance call).

## SAID Universal Access (continued)

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### Call code 110

```
HEX ID:AA STRUCTURE CODE:00625C CALL CODE:110C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C DATE:40521C 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:6211201C OVERSEAS IND:0C TERM NPA:00513C TERM
NUMBER:6215010C CONNECT TIME:1336013C ELAPSED
TIME:000000237C IC/INC PREFIX:00613C CC DATE:40521C CC
TIME:1335584C ELAPSED CC:000000266C IC/INC EVENT
STATUS:010C TRUNK GROUP NUMBER:40638C ROUTING INDICATOR:1C
DIALING INDICATOR:FF ANI INDICATOR:1C
```

The following figure is an example of an AMA record generated for call code 175 (local call).

### Call code 175 (local)

```
HEX ID:AA STRUCTURE CODE:40001C CALL CODE:175C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C DATE:40521C 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:6211201C OVERSEAS IND:0C TERM NPA:00513C TERM
NUMBER:6215010C CONNECT TIME:1336015C ELAPSED
TIME:000000227C MODULE CODE:047C SERV CODE:00088C ACCESS:4C
SUBSCR ID:00006215015C CONV REQ:1C MODULE CODE:000C
```

## Station Message Detail Recording

SAID Universal Access does not affect Station Message Detail Recording.

## Datafilling office parameters

SAID Universal Access does not affect office parameters.

## SAID Universal Access (continued)

### Datafill sequence

The following table lists the tables that require datafill to implement SAID Universal Access. The tables are listed in the order in which they are to be datafilled.

#### Datafill tables required for SAID Universal Access

Table	Purpose of table
DNROUTE	Directory Number Route. This table lists information for DNs in the switch such as a DN that identifies a route, rather than a LEN. This table also associates a DN with a specific trunk group member.
CUSTSTN	Customer Group Station Option. This table lists the station options assigned to each of the customer groups defined in the switch.
IBNXLA	IBN Translation. This table lists the name of the feature and option associated with a feature access code.
SAIDOFC	Speech Activated Intelligent Dialing Optionality. This table controls software optionality for SAID Enhanced Signaling Protocol and NFA SOD. Adding tuples to table SAIDOFC activates these functionalities upon datafill.

### Datafilling table DNROUTE

The following table shows the datafill specific to SAID Universal Access for table DNROUTE. Only those fields that apply directly to SAID Universal Access are shown. For a description of the other fields, refer to the data schema section of this document.

#### Datafilling table DNROUTE (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
DNRESULT		see subfields	Directory number results. This field consists of subfields DNSEL, FEATURE, CUSTGRP, SUBGRP, AUTHREQ, SMDRTO, SMDRFROM, and INTRAGRP.
	DN_SEL	FEAT	Directory number selector. This subfield contains the directory number selector.
	FEATURE	DISA	Feature. This subfield contains the feature type desired.
	CUSTGRP	alphanumeric (1 to 16 characters)	Customer group. This subfield defines the customer group of the listed DN.

**SAID Universal Access** (continued)

Datafilling table DNROUTE (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	SUBGRP	0 through 7	Subgroup. This subfield defines the subgroup number of the customer group.
	AUTHREQ	Y or N	Authorization required. This subfield defines whether or not an authorization code is mandatory.
	SMDRTO	Y or N	Originating station message detail recording. This subfield defines whether or not SMDR is required on the leg of the call where the originator access DISA.
	SMDRFROM	Y or N	Terminating station message detail recording. This subfield defines whether or not SMDR is required on the leg of the call from DISA to the final destination.
	INTRAGRP	Y or N	Intragroup. This field defines whether or not intragroup calls will be allowed.
	OPTIONS	see subfields	Options. This field consists of several subfields.
	DISAOPT	USAID	DISA options. This subfield defines the DISA options that will apply to this DN. An entry of up to seven options is allowed. If USAID is entered as an option, subfields AMA_CONNECT, AMA_DIAL, USERID, FORW_ANI, and ANI_FAIL_USE_DISA require datafill.
	AMA_CONNECT	NONE, CALLER, or DISA_DN	AMA connect. This subfield determines if call code 174 with module code 047 appended is generated for USAID access and to which party such a record is billed.
	AMA_DIAL	NONE, CALLER, or DISA_DN	AMA dial. This subfield controls AMA generation and determines if call code 175 with module code 047 is appended when the IP extends a call for the use.
	USERID	CALLER, or DISA_DN	User identification. This subfield determines whether the CLID or the DISA_DN is sent to the IP as the SAID user identification.

**SAID Universal Access** (continued)

**Datafilling table DNROUTE (Sheet 3 of 3)**

Field	Subfield or refinement	Entry	Explanation and action
	ANI_FAIL_US E_DISA	Y or N	ANI failed, use DISA. This subfield determines the behavior of USAID when ANI and CLID are not available. Datafill of Y indicates that if ANI spill fails, DISA DN may be used as ANI spill information.
	FORW_ANI	Y or N	Forward ANI. This subfield determines the SAID user id that is used when CLID is not available.

**Datafill example for table DNROUTE**

The following example shows sample datafill for table DNROUTE.

**MAP display example for table DNROUTE**

AREACODE	OFCCODE	STNCODE	DNRESULT
613	621	1000	FEAT DISA IBNTST 0 N N N Y USAID CALLER CALLER DISA_DN N Y

**Datafilling table CUSTSTN**

The following table shows the datafill specific to SAID Universal Access for table CUSTSTN. Only those fields that apply directly to SAID Universal Access are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table CUSTSTN (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
CUSTNAME		alphanumeric	Customer group name. This field determines the customer group to which the tuple attributes are assigned.
OPTNAME		USAID	Option name. This field determines the option name assigned.
OPTION		USAID	Option. This field defines the option. Enter USAID, then see subfields TRKGP, SC, USERID_LEN, and USAID_CLID_BLK_SC.

## SAID Universal Access (continued)

### Datafilling table CUSTSTN (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	TRKGP	alphanumeric (up to 16 characters)	Trunk group. This subfield determines the trunk group over which an USAID connection is made.
	SC	0 through 9, \$, #, and * (1 to 5 digits)	Service code. This subfield determines the service code to be outpulsed over the NFA trunk to the IP.
	USERID_LEN GTH	zero, seven or ten	User identification length. This subfield indicates the length of the SAID user identification to be outpulsed to the IP.
	USAID_CLID_ BLK_SC	0 through 9, \$, #, and * (1 to 5 digits)	USAID CLID blocking service code. This subfield stores the service code for CLID blocking. It must be datafilled in order for a service code to be outpulsed when CLID blocking is in effect.

### Datafill example for table CUSTSTN

The following example shows sample datafill for table CUSTSTN.

### MAP display example for table CUSTSTN

CUSTNAME	OPTNAME	OPTION
IBNTST	USAID	USAID USAIDTRKG 9999 zero 6

### Datafilling table IBNXLA

The following table shows the datafill specific to SAID Universal Access for table IBNXLA. Only those fields that apply directly to SAID Universal

**SAID Universal Access** (continued)

Access are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table 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. This subfield specifies the name that is assigned to the translator.
	DGLIDX	9, C, or F	Digilator index. This subfield specifies the digit or digits assigned as an ambiguous code.
RESULT		see subfield	Result. This field consists of subfield TRSEL.
	TRSEL	FEAT, REPL	Translations selector. This subfield specifies the translations selector to be used. If subfield TRSEL=FEAT, subfields ACR, SMDR, VCDR, and FEATURE require datafill. If subfield TRSEL=REPL, subfields CONTINUE, REPLCODE, OPTION, and RCNAME require datafill.
	ACR	Y or N	Account code entry. This subfield whether an account code is required.
	SMDR	Y or N	Station message detail recording. This subfield specifies whether SMDR is required.
	VCDR	Y or N	Variable call detail recording. This subfield specifies whether VCDR is required.
	FEATURE	USAID	Feature. This subfield specifies which feature to start when more than one feature is assigned to a DISA DN.
	CONTINUE	Y or N	<i>Continue</i>  Enter Y (yes) if translation continues with the next translator in the normal sequence. Enter N (no) if translation does not continue but restarts from the beginning based on the user's network class of service (NCOS) and customer translator (as if the user has dialed the replaced digits).

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**SAID Universal Access** (end)
 

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**Datafilling table IBNXLA (Sheet 2 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
	REPLCODE	numeric(1 to 16 digits)	<i>Replacement code</i> Enter the digit or digits that replace the digits dialed.
	OPTION	RC	<i>Option</i> Enter RC if a new routing characteristic is required for ISDN retranslation and datafill refinement RCNAME.
	RCNAME	alphanumeric (1 to 8 characters)	<i>Routing characteristics name</i> Enter the RC name defined in table RCNAME.

**Datafill example for table IBNXLA**

The following example shows sample datafill for table IBNXLA.

**MAP display example for table IBNXLA**

KEY		RESULT				
IBNTST	52	FEAT	N	N	N	USAID
IBNTST	53	REPL	N	6211000		

**Translation verification tools**

SAID Universal Access does not use translation verification tools.

**SERVORD**

SAID Universal Access does not use SERVORD.



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## 6 Datafilling FAX-Thru Service

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The following chapter describes the FAX-Thru Service, MSA00005, functionality.

## **FAX-Thru Service**

---

### **Ordering codes**

Functional group ordering code: MSA00005

### **Release applicability**

NA010 and up

FAX-Thru Service was introduced in NA006B.

### **Prerequisites**

To operate, FAX-Thru Service has the following prerequisites:

- BAS Generic, BAS00003
- MDC Basic, MDC00001
- Enhanced MDC, MDC00003
- Base ISUP, ISP70001
- TEL CCS7 Base, TEL00008
- RES Interface Functionality, RES00004

### **Description**

The DMS-100 FAX-Thru Service (FTS) feature is a Special Delivery Service (SDS) (Functional Group MSA00001) enhancement. The FTS feature will route an outgoing FAX message to a FAX Messaging Platform (FMP) if the destination FAX machine is busy or does not answer. Once the destination FAX machine is available, the FMP will forward the FAX from storage to the original destination.

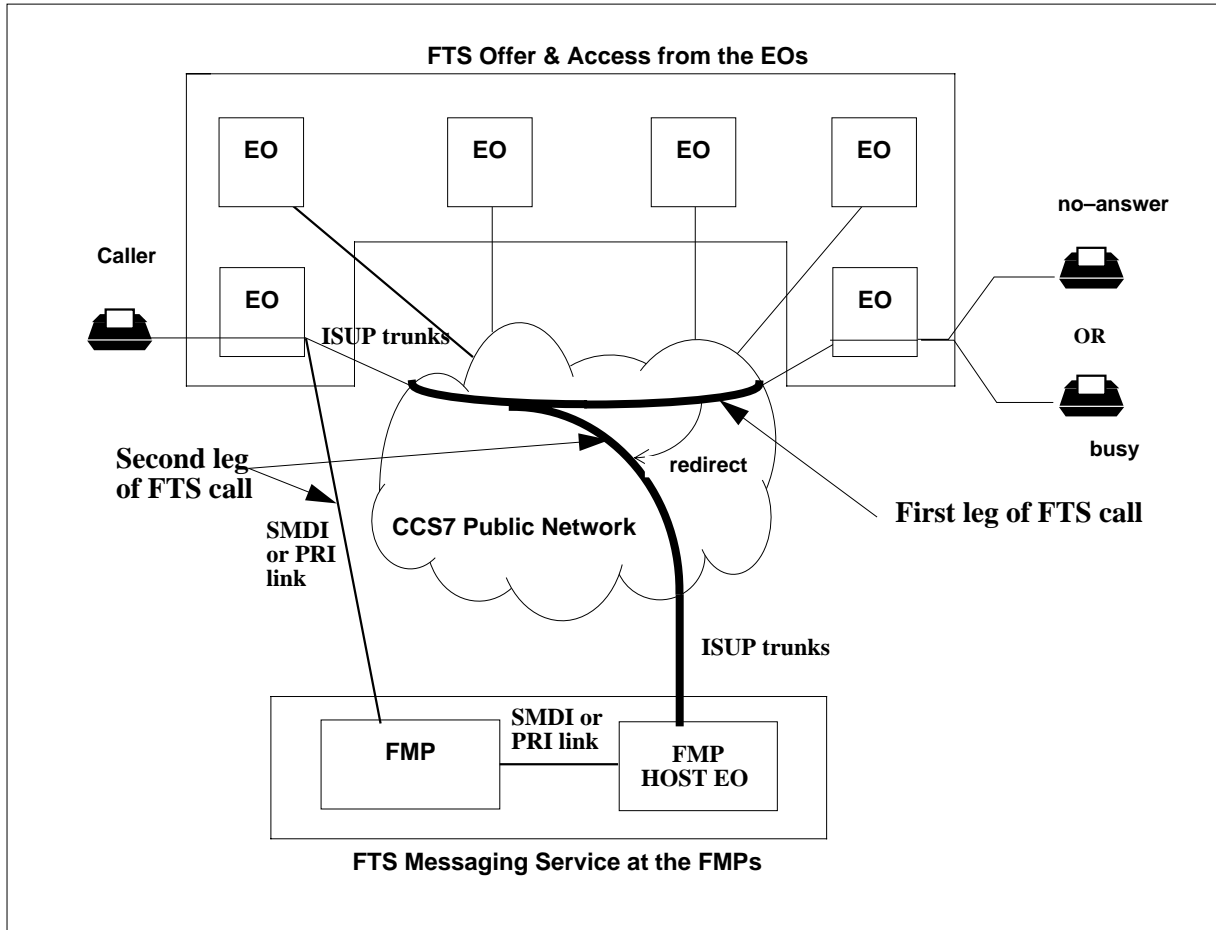
FTS requires rerouting of a call at the end-office (EO) where the FAX call originates. The originating EO reroutes a call to the FMP after detecting a busy or no-answer condition from the terminating office. The FMP transmits the FAX from storage to the original destination when the destination FAX machine is available.

### **Operation**

The following figure contains a schematic representation of a typical FTS call.

**FAX-Thru Service** (continued)

**Schematic representation of a typical FTS call**



**Subscriber interaction with FTS feature**

FTS is offered on all calls originated from lines with the FTS option. When a FAX call is originated, the SDS software monitors the call for a busy signal or no-answer condition. If either condition is present, and if the SDS screening criteria is satisfied, the call is routed to the FMP.

When a busy condition is detected, the call is always routed to the FMP. With a no-answer condition, the originating EO will maintain connection with the called party for the duration of the FTS no-answer time-out period. If the called party answers within the time-out period, then FTS is not offered and the calling and called parties are left connected.

Subscribers cannot control any options associated with FTS.

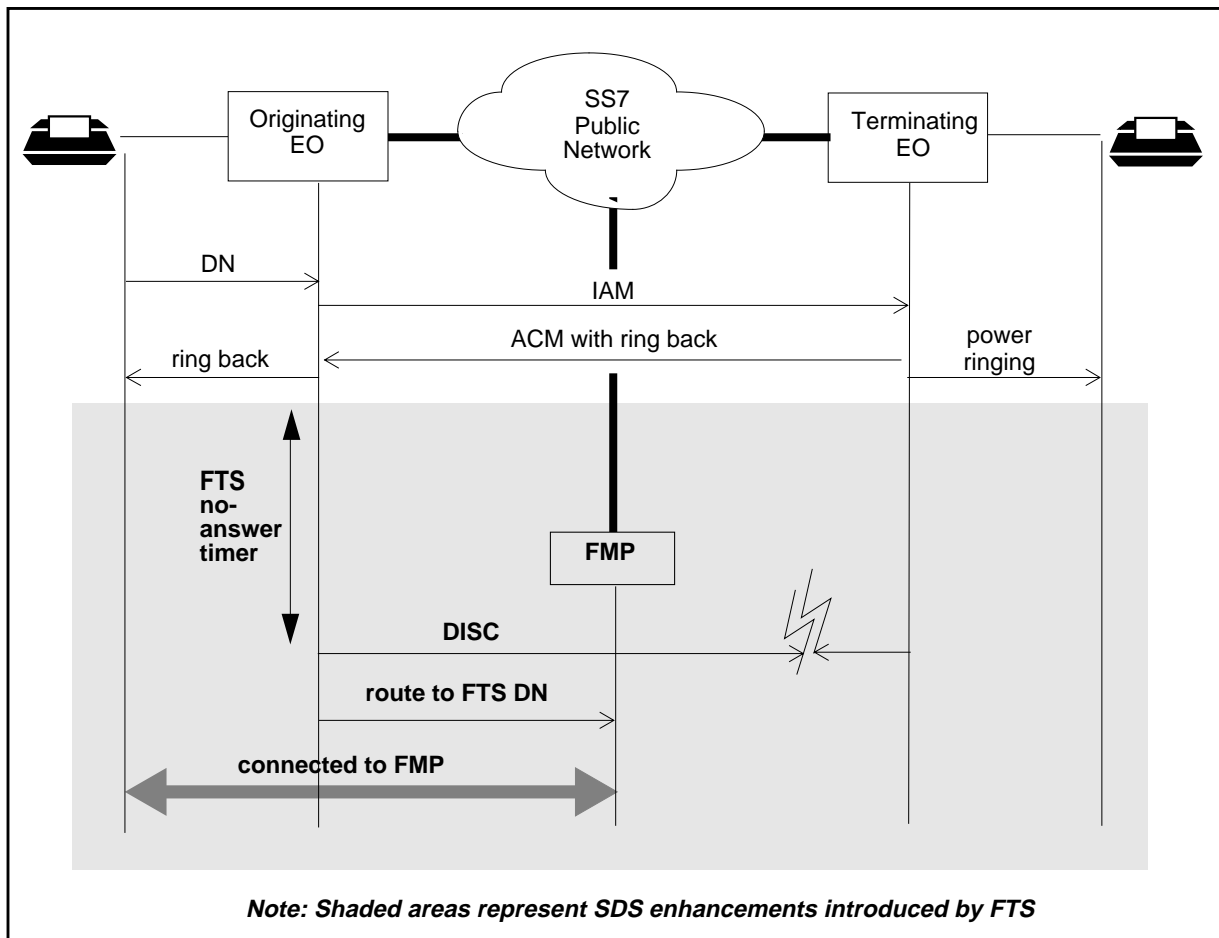
**FAX-Thru Service** (continued)

**Service examples**

The figure below displays the call process of a typical FTS call with a no-answer condition that includes the following steps:

1. User enters DN of destination FAX. FAX machine dials DN,
2. Ring back is applied to the caller's FAX machine,
3. FTS no-answer timer is started,
4. After the FTS ringing-no-answer time-out has elapsed, the caller is disconnected from the called party. SDS extracts the FTS routing information from table SDSINFO and the call is routed to the FMP DN.

**FTS call flow during the no-answer condition**

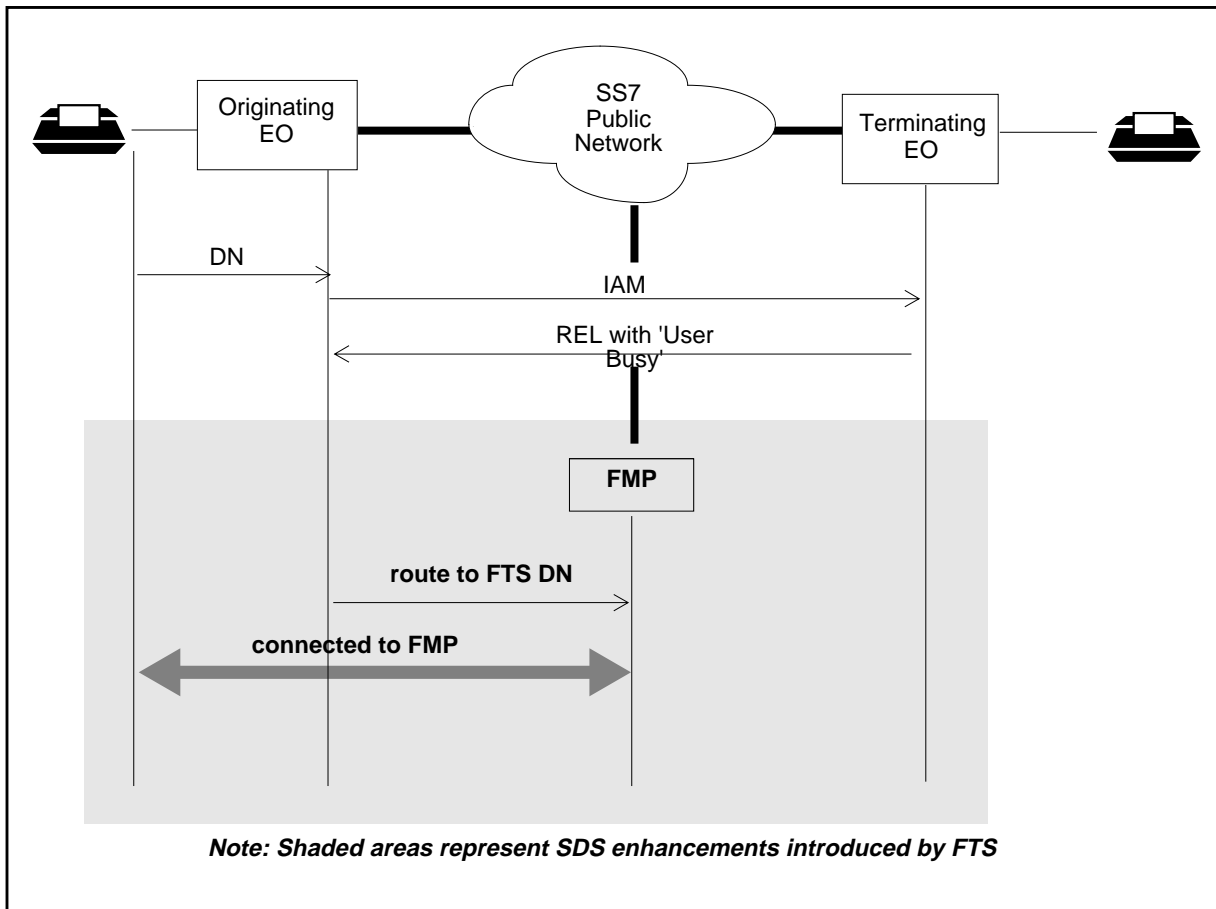


**FAX-Thru Service** (continued)

The figure below displays the call process of a typical FTS call with a busy condition that includes the following steps:

1. User enters DN of destination FAX. FAX machine dials DN,
2. Busy condition is encountered,
3. SDS extracts the FTS routing information from table SDSINFO and the call is routed to the FMP DN.

**FTS call flow during the busy condition**



## FAX-Thru Service (continued)

---

### Operating company interaction with FTS feature

The following FTS feature control capabilities are available to the operating company:

- Activating FTS by using SOC on functionality MSA00005.

*Note:* FTS can be activated without SDS (functionality group MSA00001) being active.

- Assigning the FTS feature to lines using SERVORD.

FTS is compatible with Residential Enhanced Services (RES), (One-Party Message Rate (1MR), One-Party Flat Rate (1FR)) and Integrated Business Network (IBN) line class codes.

When assigning the FTS option to a Plain Ordinary Telephone Service (POTS) line (DP and DTMF with LCC of 1FR or 1MR), the field RES\_AS\_POTS of office parameter RES\_SO\_SIMPLIFICATION in table OFCVAR must be set to Y. POTS lines assigned the FTS option are converted to RES lines.

When SDS is offered on a customer group basis (MSA00003), or office-wide (feature Selective Call Messaging (SCM), MSA00004), and FTS is assigned to the line, the FTS option has precedence over the SDS option. SDS and FTS line options are mutually exclusive, and cannot both be assigned to the same line.

- In table SDSINFO, entering the following information
  - the FTS no-answer time-out duration;
  - the FMP DN for intraLATA calls; and
  - the FMP DN for interLATA calls.
- If the capabilities introduced by the SDS Enhancements feature are desired, then functionality (MSA00003) or Selective Call Messaging (MSA00004) should be active.

*Note:* the SDS Enhancements feature (MSA00003) or Selective Call Messaging (MSA00004) can only be activated if the SDS functionality group (MSA00001) is active.

### Translations table flow

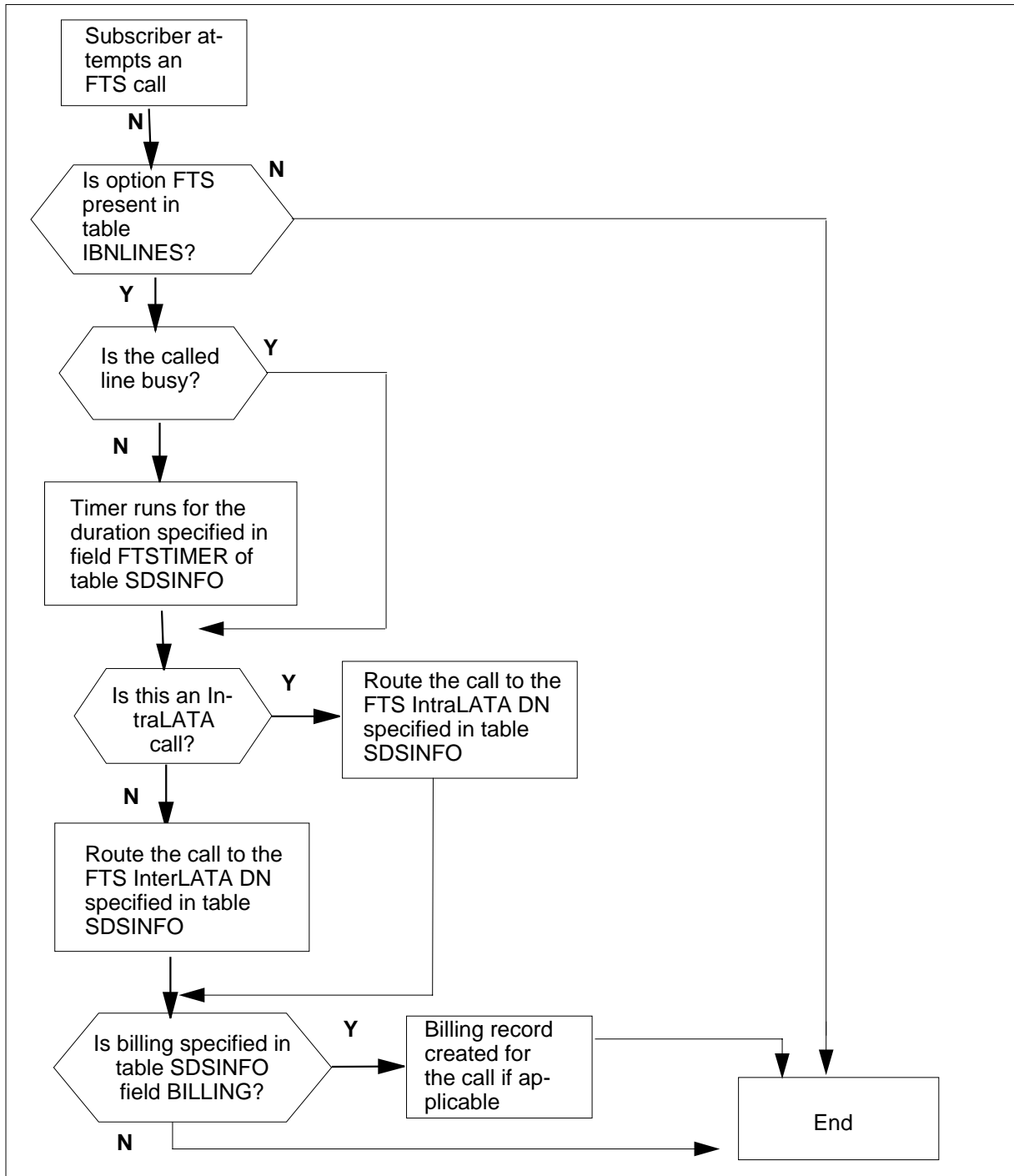
The FAX-Thru Service translations tables are described in the following list (only the specific tables affecting this feature are described):

- Table IBNLINES
- Table SDSINFO

**FAX-Thru Service** (continued)

The FAX-Thru Service translation process is shown in the flowchart that follows.

**Table flow for FAX-Thru Service**



## FAX-Thru Service (continued)

---

The following table lists the datafill content used in the flowchart.

### Datafill example for FAX-Thru Service

Datafill table	Example data
IBNLINES	HOST 00 0 02 15 0 DT STN IBN 5903739 IBNEA545 2 4 613 (FTS) \$
SDSINFO	OFFICE OFFICE Y N Y (819622) (819626) \$ (MCI) (ATT) \$ FTS FTS 18 6211501 6211502

### Limitations and restrictions

Primary Rate Interface (PRI) routing on the second leg of the call is only supported when SDS Enhancements (Functionality code MSA00003) or Selective Call Messaging (MSA00004) is enabled.

When SDS is offered to a customer group (using functionality SDS Enhancements MSA00003), or office-wide (using functionality Selective Call Messaging MSA00004), and FTS is assigned to a line, FTS takes precedence over SDS.

FAX-Thru Service is not compatible with the following line options:

- Automatic Recall Dialable Directory Number (ARDDN)
- Automatic Line (AUL)
- Automatic Call Back (ACB)
- Automatic Recall (AR)
- Call Hold (CHD)
- Calling Line Identification with Flash (CLF)
- Conference (CNF)
- Call Park (PRK)
- Call Pick-Up (CPU)
- Call Screening Monitoring and Interception (CSMI)
- Call Transfer (CXR)
- Call Waiting Ringback (CWR)
- Call Waiting (CWT)
- Call Waiting Originator (CWO)
- Directed Call Pick-Up with Barge-In (DCBI)



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**FAX-Thru Service** (continued)

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- Directed Call Park (DCPK)
- Distinctive Ringing (DRING)
- Deluxe Spontaneous Call Waiting Identification (DSCWID)
- Distinctive Ringing/Call Waiting (DRCW)
- Executive Busy Override (EBO)
- Essential Line (ELN)
- Executive Message Waiting (EMW)
- Feature Group (FTRGRP)
- Hold (HLD)
- In-Service Activation (ISA)
- Last Number Redial (LNR)
- Message Waiting (MWT)
- Network Facility Access (NFA)
- Residential Call Hold (RCHD)
- Ring Again (RAG)
- Special Delivery Service (SDS)
- Teen Service (Secondary DN (SDN))
- Service Group (SVCGRP)
- Three-Way Call (3WC)

**Interactions**

FAX-Thru Service has the same feature interactions as SDS with the following exceptions:

- The SDS Enhancements feature (Functionality code MSA00003) provides compatibility between the SDS option and the Conference (CNF) feature and the Three-Way Call (3WC) feature. FTS is not compatible with CNF and 3WC even when the SDS Enhancements feature (MSA00003) or Selective Call Messaging (MSA00004) is active. SDS is allowed on the second leg of a three-way call. FTS is not allowed on the second leg of a three-way call.
- There is no dependency between the SDS and FTS supported line class codes.

**Activation/deactivation by the end user**

FAX-Thru Service requires no activation or deactivation by the end user.

---

## FAX-Thru Service (continued)

---

### Billing

An AMA record is generated on an FTS call depending on the value of field BILLING in table SDSINFO as follows:

- If field BILLING is set to N (no), an AMA record is not generated.
- If field BILLING is set to Y (yes), FTS generates an AMA record for the call leg between the originating end office and the FAX Message Platform (FMP).

*Note:* Billing is not performed on the first leg of an FTS call.

### Station Message Detail Recording

FAX-Thru Service does not affect Station Message Detail Recording.

### Datafilling office parameters

The following table shows the office parameters used by FAX-Thru Service. For more information about office parameters, refer to *Office Parameters Reference Manual*

#### Office parameters used by FAX-Thru Service (Sheet 1 of 2)

Table name	Parameter name	Explanation and action
OFCAUT	NO_OF_SDS_EXT_BLKs	This parameter must be increased by a number obtained using a formula for calculating the impact of FTS calls. Refer to the <i>Customer Data Schema Reference Manual</i> .
OFCENG	NO_OF_HIS_DATA_BLKs	This parameter must be increased by a number obtained using a formula for calculating the impact of FTS calls. Refer to the <i>Office Parameters Reference Manual</i> .
OFCENG	NO_OF_MEDIUM_FTR_DATA_BLKs	This parameter must be increased by a number obtained using a formula for calculating the impact of FTS calls. Refer to the <i>Office Parameters Reference Manual</i> .

## FAX-Thru Service (continued)

### Office parameters used by FAX-Thru Service (Sheet 2 of 2)

Table name	Parameter name	Explanation and action
OFCENG	NUMCPWAKE	This parameter must be increased by a number obtained using a formula for calculating the impact of FTS calls. Refer to the <i>Office Parameters Reference Manual</i> .
OFCENG	NO_OF_ORIG_INFO_EXT_BLKs	This parameter controls the number of existing AIN_ORIG_INFO extension blocks allocated for FTS on the switch. AIN_ORIG_INFO extension blocks are used to store the charge number and calling number information to preserve AIN 0.1 calling and charge information for redirected calls. Refer to the <i>Office Parameters Reference Manual</i> .

### Datafill sequence

The following table lists the tables that require datafill to implement FAX-Thru Service. The tables are listed in the order in which they are to be datafilled.

#### Datafill tables required for FAX-Thru Service

Table	Purpose of table
IBNLINES	contains the line assignments for each set assigned to an Integrated Business Network (IBN), Residential Enhanced Services (RES), Multiple Appearance Directory Number (MADN) station numbers, and the line assignments for the IBN attendant consoles (AC)
SDSINFO	enables the operating company to control Special Delivery Service (SDS) parameters and all associated services such as FTS for an end office.

### Datafilling table IBNLINES

The following table shows the datafill specific to FAX-Thru Service for table IBNLINES. Only those fields that apply directly to FAX-Thru Service are shown. For a description of the other fields, refer to the data schema section of this document.

#### Datafilling table IBNLINES

Field	Subfield or refinement	Entry	Explanation and action
OPTLIST		alphanumeric	This field contains all options assigned to the line

## FAX-Thru Service (continued)

### Datafill example for table IBNLINES

The following example shows sample datafill for table IBNLINES.

### MAP display example for table IBNLINES

LEN	DNNNO	RESULT
-----		
HOST 00 0 02 15		
	0 DT STN IBN 5903739	IBNEA545 2 4 613 (FTS) \$

### Datafilling table SDSINFO

The following example shows sample datafill for table SDSINFO. Only those fields that apply directly to FAX-Thru Service are shown. For a description of the other fields, refer to the *Data Schema Manual*.

#### Datafilling table SDSINFO (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
SDSKEY		OFFICE	<i>Special Delivery Service Key</i> Enter OFFICE to access the common information fields.
SERVICE		OFFICE	<i>Service Selector</i> Enter OFFICE and datafill the common information fields BILLING, REVXLA, INTERLAT, DNSCRN, and ALLOWCAR.
	BILLING	Y or N	<i>Billing</i> Enter Y (yes) to allow billing on the call to the SDS DN. If you enter N (no), billing is suppressed on the SDS leg of the call, and no AMA record is generated even if the SDS leg is billable according to translations.  The default value is Y.

**FAX-Thru Service** (continued)

Datafilling table SDSINFO (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	REVLXA	Y or N	<p><i>Reverse translation</i></p> <p>Enter Y (yes) if reverse translations are needed to determine the NPA of the called party (when it is not dialed). Enter N (no) if reverse translations are not needed.</p>
	INTERLAT	Y or N	<p><i>Inter-LATA calls</i></p> <p>Enter Y (yes) if SDS is enabled on inter-LATA calls. Otherwise, enter N (no).</p> <p>The default value is N.</p>
	DNSCRN	list of 3- or 6-digit DNs (maximum 51 entries)	<p><i>Directory number screening</i></p> <p>List the digit ranges used to screen the dialed digits. Terminate the list with \$.</p>
	ALLOWCAR	list of 1- to 16-character carrier names	<p><i>Allowed carriers</i></p> <p>List the carriers that can have SDS activated. Terminate the list with \$.</p>
SDSKEY		FTS	<p><i>Special Delivery Service Key</i></p> <p>Enter FTS to access the FTS specific information fields.</p>
SERVICE		FTS	<p><i>Service Selector</i></p> <p>Enter FTS and datafill the FTS information fields FTSTIMER, FTSINTER, and FTSINTRA.</p>
	FTSTIMER	0 to 127	<p><i>FAX-Thru Service no-answer timer</i></p> <p>Enter the value (in seconds) for the timer to run before routing the call the FAX Messaging Platform.</p> <p><b>Note:</b> When a value of 0 is entered, the FTS call is not rerouted in the ringing no answer case.</p>

## FAX-Thru Service (continued)

### Datafilling table SDSINFO (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	FTSINTER	7- or 10-digit DN	<i>Fax_Thru Service inter-LATA DN</i> Enter the FTS routing DN for inter_LATA calls.
	FTSINTRA	7- or 10-digit DN	<i>Fax_Thru Service intra-LATA DN</i> Enter the FTS routing DN for intra_LATA calls.

### Datafill example for table SDSINFO

The following example shows sample datafill for table SDSINFO.

### MAP display example for table SDSINFO

```

SDSKEY
                                     SERVICE
-----
OFFICE
OFFICE Y N Y (819622) (819626) $ (MCI) (ATT) $

FTS FTS 18 6211501 6211502
    
```

## SERVORD

The service order system (SERVORD) is used to add, delete, or change the FTS feature on subscriber lines.

### SERVORD limitations and restrictions

FAX-Thru Service has no SERVORD limitations and restrictions.

### SERVORD example for adding FAX-Thru Service

The following SERVORD example shows how FAX-Thru Service is added to a line using the ADO command.

---

**FAX-Thru Service** (end)

---

**SERVORD example for FAX-Thru Service in prompt mode**

**>ADO**

SONUMBER: NOW 95 11 28 PM

**>**

DN\_OR\_LEN:

**> 6211061**

OPTION:

**> FTS**

OPTION:

**SERVORD example for FAX-Thru Service in no-prompt mode**

**> ADO \$ 6211061 FTS \$**





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## 7 Datafilling MDS Call Messenger

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The following chapter describes the MDS Call Messenger, MDS00001, functionality.

## Call Messenger

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### Ordering codes

Functional group ordering code: MDS00001

Functionality ordering code: not applicable

### Release applicability

Call Messenger was introduced in CDN003.

### 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

Call Messenger (CMSG) is a universal feature offered to single-line, non-private branch exchange (PBX) end users with RES service. Call Messenger enables a caller to send a message to the called party after an unsuccessful long distance call or toll call. Call Messenger allows the caller to access the messaging service through a TOPS switch or an InterExchange Carrier's (IEC) gateway. Call Messenger does not provide the messaging service itself.

There are two variations of the Call Messenger service: Standard Call Messenger (SCMSG) and Intentional Call Messenger (ICMSG). Standard Call Messenger allows the end user to leave a message for the last party dialed by hanging up, going off-hook, and dialing the Standard Call Messenger access code (for example, \*43 or 1143 for dual-tone multifrequency (DTMF) sets or 1143 for dial pulse (DP)/rotary sets). Intentional Call Messengers allows the end user to leave a message for any party by hanging up, going off-hook, and dialing the Intentional Call Messenger code (for example, \*44 or 1144 for DTMF sets or 1144 for DP/rotary sets). The end user enters the 10-digit directory number (DN) after being connected to the messaging service and being prompted for the DN.

### Operation

Call Messenger connects the end user to a gateway that offers the messaging service. The call translation is performed when the feature is activated from the originating line using the dial access code. The originating line must be in a RES end user group that is datafilled with the Call Messenger feature in the feature translator (table IBNXLA).

---

**Call Messenger** (continued)

---

If translation fails because the line is not datafilled for Call Messenger, the vacant error treatment (VACT) is applied to the calling party. Otherwise, the feature is invoked and screening starts.

### Line class code screening

Table LINEATTR screens the line from which Call Messenger is activated. If the line fails the screening, final treatment (FNAL) is applied to the originating line.

Only residential lines with the following line class codes (LCC) are supported.

- RES
- RES one-party flat rate (1FR)
- RES one-party message rate (1MR)

Call Messenger can be activated from lines terminating on any of the following peripheral modules (PM).

- line concentrating module (LCM) or remote line concentrating module (RLCM) connected to a line group controller (LGC), a line trunk controller (LTC), or a remote cluster controller (RCC)
- remote carrier urban (RCU) module connected to a subscriber carrier module-100 urban (SMU)
- line module (LM)
- remote line module (RLM) operating in conjunction with with a digital carrier module-R (DCM)
- S/DMS AccessNode

### DN format supported by Call Messenger

The dialed DN formats Call Messenger supports are shown in the following table.

#### Dialed DN formats supported by Call Messenger (Sheet 1 of 2)

Prefix digit(s)	Meaning	Number of digits
none	Local	7 or 10
1	Long distance recipient	8 or 11
10+CCC+1	Casual access dialing. Central control complex (CCC) represents the carrier's 3-digit carrier identification carrier (CIC).	13 or 16

## Call Messenger (continued)

### Dialed DN formats supported by Call Messenger (Sheet 2 of 2)

Prefix digit(s)	Meaning	Number of digits
101+XCCC+1	Casual access dialing during the transitional period of the CIC code expansion. CCC represents the carrier's 3-digit CIC. X can be 0, 5, or 6.	15 or 18
101+CCCC+1	Casual access dialing after the CIC code expansion is completed. CCCC represents the carrier's 4-digit CIC.	15 or 18

The following numbers fail the dialed DN screening and are routed to treatment.

- 0+/0-
- overseas
- N11 (for example, 911, 411)
- 555-1212 or NPA-555-1212

1-800 and 1-900 numbers are routed to the messaging service and the messaging service screens those calls.

### Equal access to the messaging service

Call Messenger supports equal access to different carriers' messaging services. For Standard Call Messenger, one of the following, in order of precedence, determines the carrier's messaging service.

- the CIC from the carrier access code (CAC) of a casual dialing of the dialed DN.
- the caller's primary Inter-LATA carrier (PIC)
- the caller's network class of service (NCOS) PIC
- the caller's customer group PIC
- the end office (EO) default PIC

For Intentional Call Messenger, the caller's PIC determines the carrier's messaging service. If there is no PIC, the caller's customer group PIC determines the carrier's messaging service. Otherwise, the EO default PIC is used. If the PIC is NILC, error treatment is applied to the call.

---

**Call Messenger** (continued)

---

**Call transfer to service gateway**

A call is routed, as specified by the route reference in table CMSGCTRL, to either a TOPS switch or an IEC's service gateway where a messaging service is offered.

The network connection to an IEC's service gateway can be:

- a direct connection between the originating EO and the IEC's service gateway.
- a connection from the originating EO to an Access Tandem (AT) and a connection from the AT to the IEC's service gateway.

The following trunk groups provide the connection between the originating EO and the TOPS, AT, or IEC's service gateway.

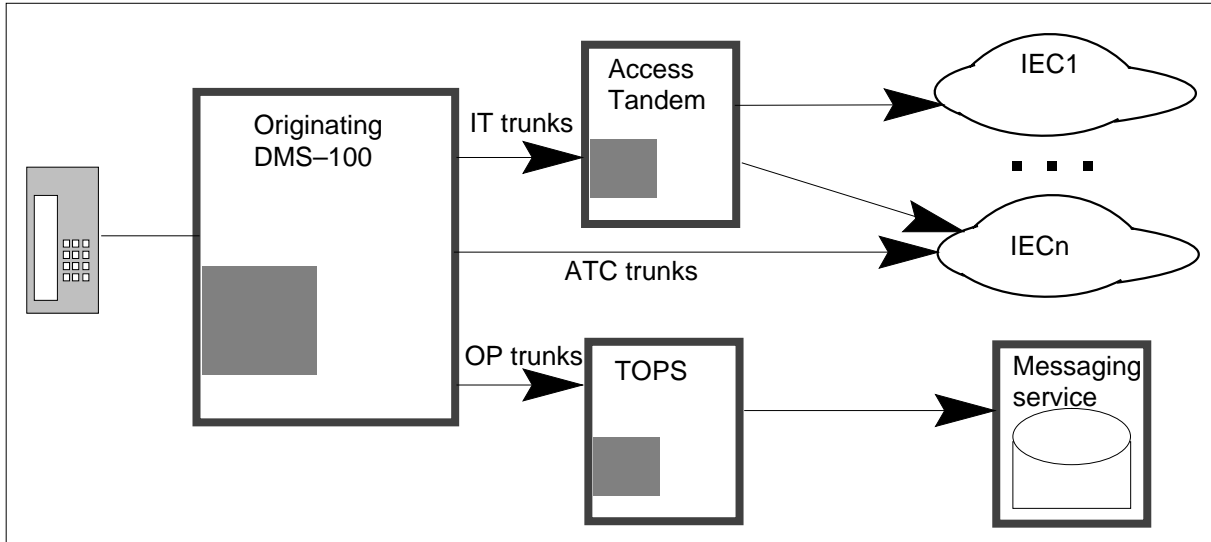
- Operator (OP) trunks—trunks between the EO and the TOPS switch using Interim Operator Services Signaling (OSS) protocol
- InterToll (IT) trunks—trunks between the EO and the AT using Feature Group D (FGD) signaling
- Access to carrier (ATC) trunks—trunks between the EO and the IEC's service gateway using FGD signaling

If the TOPS switch or the service gateway recognizes Call Messenger calls by the automatic number identification (ANI) ID, these trunk groups can carry Call Messenger traffic along with other types of traffic. Otherwise, the trunk group must be dedicated for Call Messenger traffic only.

If the signaling used on the existing combined trunks between the EO and the TOPS switch is Interim OSS, these trunks can be used to carry Call Messenger traffic.

The following figure illustrates the different routes that an EO uses to route a Call Messenger call to a messaging service.

**Call Messenger** (continued)



**Message protocols**

The signaling format used on trunk groups that carry Call Messenger calls must allow the transfer of a calling number along with a called number to the service gateway. The following table lists the signaling formats and trunk group types supported by Call Messenger.

**Signaling format and trunk group type (Sheet 1 of 2)**

Signaling format	Trunk group type	Caller's DN	Two-digit ANI ID	Dialed DN
Interim OSS [multifrequency (MF)]	OP	In second stage of outpulsing		In first stage of outpulsing
Feature Group D (MF)	IT	In second stage of outpulsing (must set ANI field to Y for the carrier in table OCCINFO)		In third stage of outpulsing

**Call Messenger** (continued)**Signaling format and trunk group type (Sheet 2 of 2)**

Signaling format	Trunk group type	Caller's DN	Two-digit ANI ID	Dialed DN
	ATC	In second stage of outpulsing (must set ANI field to Y for the carrier in table OCCINFO)		In second stage of outpulsing
Feature Group D [ISDN user part (ISUP)]	IT or ATC	In calling party number parameter (must set INCCPN field to Y for the carrier in table OCCINFO)	In originating line information (OLI) parameter (must set ANI field to Y for the carrier in table OCCINFO)	In called party number parameter

**Screening for Standard Call Messenger**

For messaging to the last called number, screening on the outgoing call memory (OCM) is performed after LCC screening. If the OCM screening is successful, the carrier is selected and then screened. Then, the call is routed to the carrier's service gateway.

**OCM screening**

OCM screening verifies the presence of an OCM for the line and that the OCM is not empty. Then, the following screening functions are performed on the dialed DN retrieved from the line's OCM.

- If field DESTINATION DN PRI in the OCM is set to SUPPRESSED, error treatment is applied.
- If field DN UNUSABLE in the OCM is set to TRUE, error treatment is applied.
- If the dialed DN is a switch-based group intercom (GIC) member number, the dialed DN is converted to a DN and feature operations continue.
- If the dialed DN is the same as the end user's DN (as when the station ringer feature is invoked immediately before activating SCMSG), CMSG error treatment is applied to the line.
- If the dialed DN does not conform to a valid format, CMSG error treatment is applied. The following numbers are screened out: local, overseas, 0+, 0-, N11, 555-1212 and NPA-555-1212.

If OCM screening fails at any point, OCM error treatment either applies the CMSG error treatment or routes the call to the messaging service. Field OCMTREAT in table CMSGCTRL defines the OCM error treatment for the carrier.

## Call Messenger (continued)

---

### Determining the carrier

The carrier is determined from the following in order of preference:

- the CIC from a casual dialing of the dialed DN (if the DN is valid)
- the PIC of the caller (if the PIC exists for the line)
- the PIC of the caller's NCOS
- the PIC of the caller's customer group
- the EO default PIC

### Carrier screening

Table CMSGCTRL screens the carrier once the carrier is determined. If there is no entry for the carrier in the table, the carrier is not considered a Call Messenger service provider and error treatment is applied. If there is an entry for the carrier but its SCMSG field is datafilled N, indicating that it does not offer the Standard Call Messenger service, CMSG error treatment is applied. If the carrier has an entry in table CMSGCTRL and its SCMSG field is datafilled Y, the call proceeds.

### Screening for Intentional Call Messenger

ICMSG calls undergo the same call translation and LCC screening as SCMSG calls. Then, the following screening is performed.

- The carrier is determined from the following in order of preference:
  - end user's PIC
  - NCOS PIC
  - customer group PIC
  - EO default PIC. This PIC may be a treatment, in which case the treatment is applied to the call.

*Note:* If the PIC is NILC, CMSG error treatment is applied to the call.

- The carrier is screened in table CMSGCTRL to determine if it offers Intentional Call Messenger (indicated by Y datafilled in field ICMSG for the carrier). If the carrier does not offer Intentional Call Messenger, CMSG error treatment is applied.

### Call routing

If a call is being transferred to a carrier's service gateway, the call is sent to the office route defined to carry CMSG traffic. The office route is specified in field RTEREF of the carrier's entry in table CMSGCTRL. The trunk groups specified by the route can carry mixed traffic only if the CMSG traffic can be



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**Call Messenger** (continued)

---

segregated from other types of traffic based on the ANI ID. Otherwise, the trunk groups used must be dedicated to CMSG traffic only.

**Error treatment**

An operating company-definable announcement or an existing DMS standard treatment provides Call Messenger error treatment. Office parameter RES\_CMSG\_ACCESS\_AND\_ERROR\_TMT in table OFCVAR defines the error treatment.

**Translations table flow**

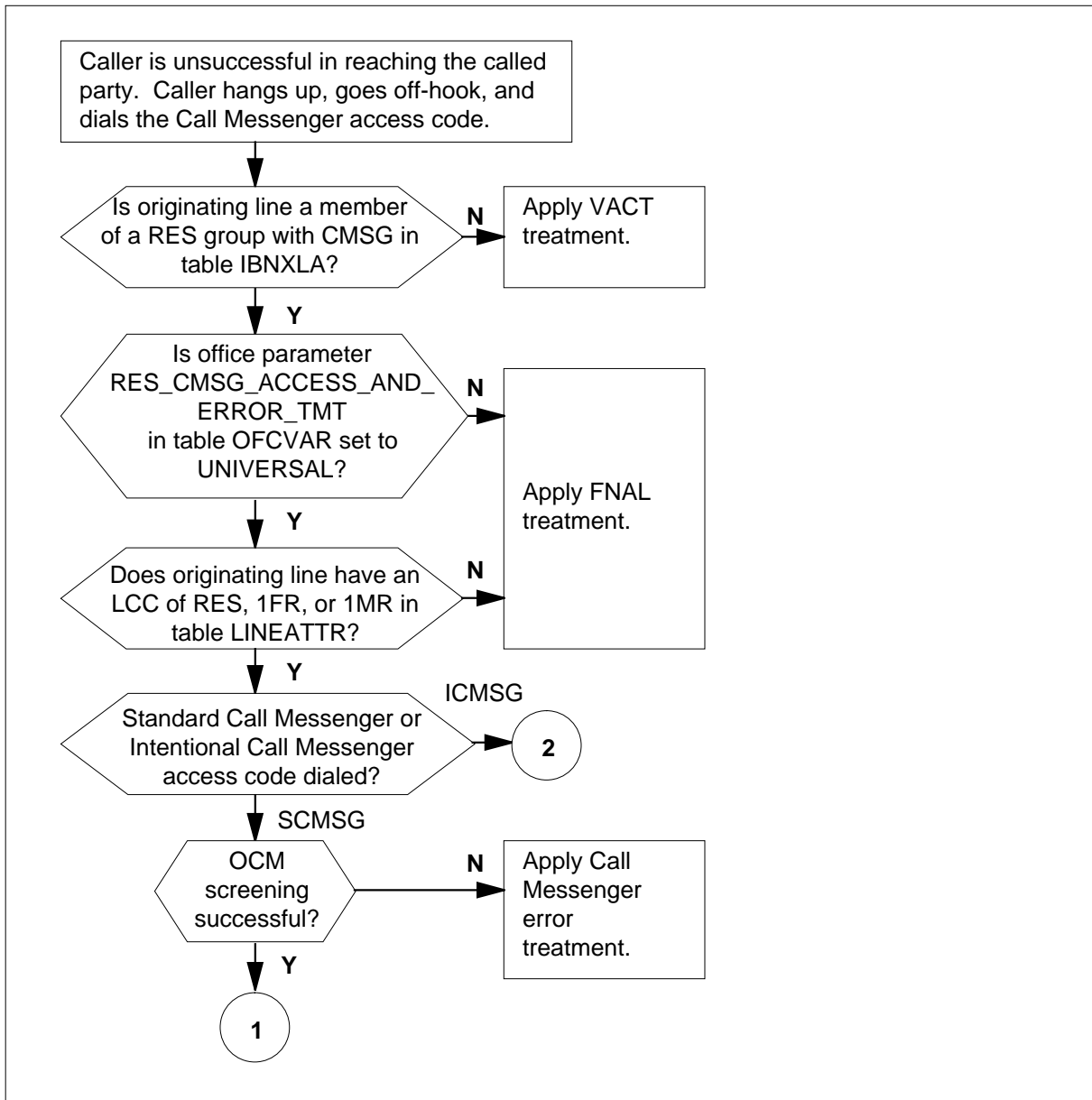
The Call Messenger translations tables are described in the following list:

- Table IBNXLA stores the data for the digit translation of calls from an MDC station, an attendant console, an incoming, or an incoming side of a two-way MDC trunk group.
- Table CMSGCTRL defines which carriers carry Call Messenger traffic and the conditions under which traffic is carried.

The Call Messenger translation process is shown in the flowcharts that follow.

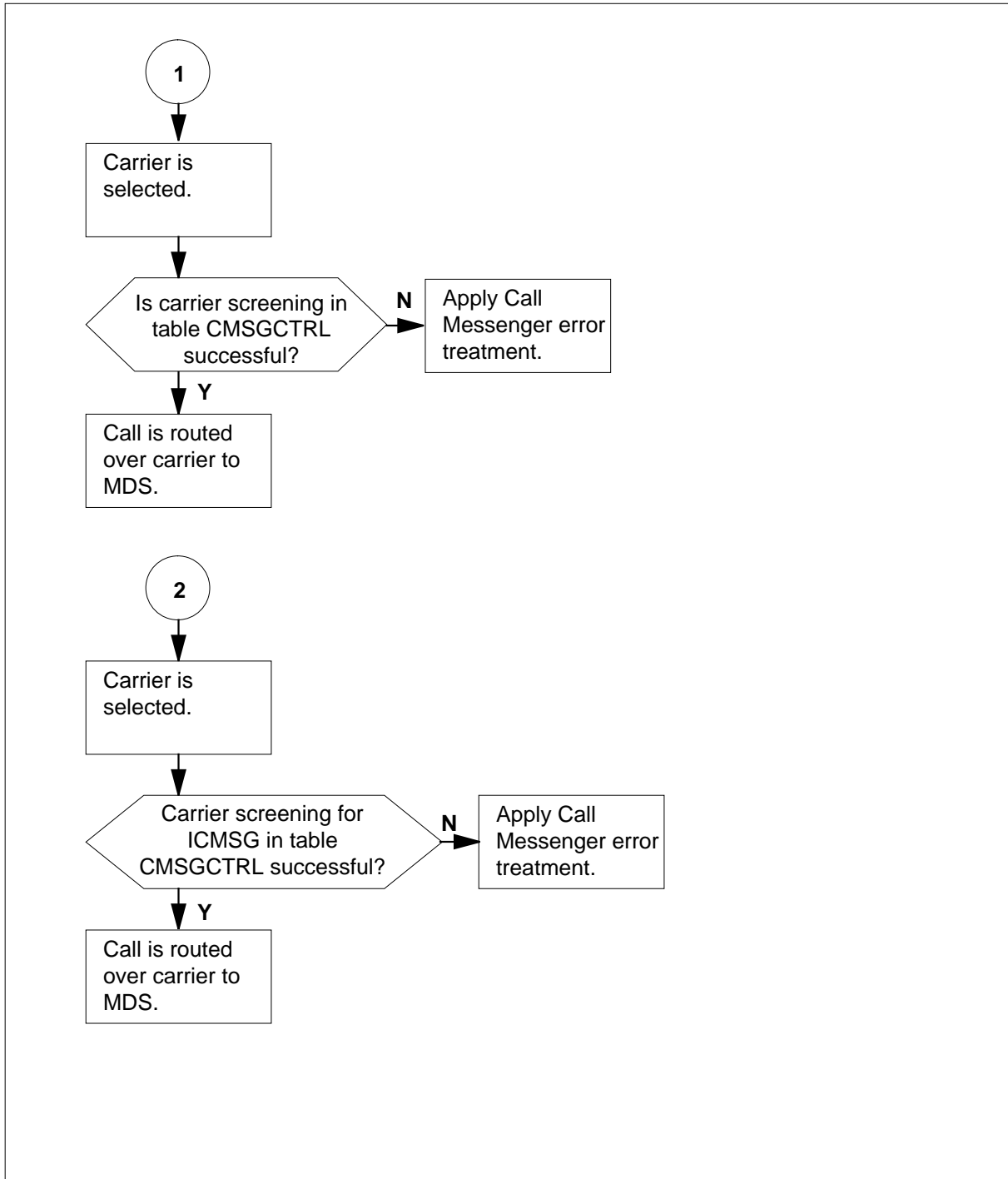
## Call Messenger (continued)

Table flow for Call Messenger



**Call Messenger (continued)**

**Table flow for Call Messenger (continued)**



---

## Call Messenger (continued)

---

The following table lists the datafill content used in the flowchart.

### Datafill example for Call Messenger

Datafill table	Example data
IBNXLA	RESGRP 11 STAR 43 FEAT N Y N SCMSG FEAT N Y N ICMMSG RESGRP 44
OFCVAR	RES_CMSG_ACCESS_AND_ERROR_TMT UNIVERSAL ANNCLLI CMSGANNENG
CMSGCTRL	CARRIERONE CARRIER Y N Y 48 OFRT 79 LOCAL Y 54 OFR3 150 LOCAL

### Limitations and restrictions

The following limitations and restrictions apply to Call Messenger:

- Call Messenger is intended for DMS-100 SuperNode, DMS-100/200 SuperNode (loop-around trunks are required from the 100 side to the 200 side), and BRISC processors.
- Call Messenger supports only residential lines with a line class code of RES, RES 1FR, or RES 1MR.
- Call Messenger does not support cellular phone end users, MDC lines, multi-party lines, Centurion and Millenium phone lines, and PBX trunks.
- 1FR and 1MR POTS lines must be converted to RES LCCs to allow Call Messenger activation from those lines. (The conversion can be accomplished by using the RES line class code (MAKERES) command or by assigning a RES option that requires OCM on the line.)
- A direct link between the EO and the TOPS switch is required to carry the Call Messenger traffic.
- Call Messenger does not verify whether the DN specified by the caller is a valid number.
- Automatic call back (ACB) reverse translator is used if the end user's group does not have a public translator.
- All Standard Call Messenger traffic associated with local messaging recipients can be routed only to the same operating company.

### Interactions

The following paragraphs describe the interactions between Call Messenger and other functionalities.

---

**Call Messenger** (continued)

---

**Group Intercom**

If the previously dialed DN is a switched-based GIC member number, Call Messenger converts the member number into a proper DN and the call is processed as a 7- or 10-digit number.

**Three-way call**

Call Messenger can be activated on the first leg, but not on the second leg, of a three-way call. Once a connection to a messaging service is made on the first leg and a second connection is made on the second leg, three-way calling can be activated and the conversation can be recorded by the messaging service.

**Call waiting/toll alert**

Both features call waiting and toll alert operate as usual. If there is an incoming call, the end user hears the alert tone and can hook-flash to receive the call. The connection to the messaging service is put on hold and the messaging service continues to record.

**Station ringer**

If the station ringer feature is invoked, the OCM is updated with the caller's 10-digit DN. If the caller then activates Standard Call Messenger, the feature applies error treatment because Call Messenger service is denied if the DN in the OCM is the DN of the caller.

**DN suppression**

If the DN suppression bit in the OCM is set to TRUE, the Call Messenger feature is denied to the caller.

**Toll deny**

Local and toll messaging are denied to the end user. The call is routed to error treatment.

**Carrier toll deny**

If the caller's PIC is the carrier specified in the carrier toll denied (CTD) option on the caller's line or if the caller does not have a PIC and the EO default PIC is the carrier specified in the CTD option present on the caller's line, local messaging is denied to the end user and Call Messenger routes the call to the CMSG error treatment.

**AIN**

No information query is sent to Advanced Intelligent Network (AIN).

## Call Messenger (continued)

---

### Activation/deactivation by the end user

To activate Call Messenger, the end user makes a call and fails to reach the called party. The end user hangs up, goes off-hook, and dials the Call Messenger access code (for example, \*43).

### Billing

Call Messenger does not affect billing.

### Station Message Detail Recording

Call Messenger does not affect Station Message Detail Recording.

### Datafilling office parameters

The following table shows the office parameter used by Call Messenger. For more information about office parameters, refer to *Office Parameters Reference Manual*.

#### Office parameters used by Call Messenger

Table name	Parameter name	Explanation and action
OFCVAR	RES_CMSG_ACCESS_AND_ER ROR_TMT	Activates the service and specifies error treatment.

### Datafill sequence

The following table lists the tables that require datafill to implement Call Messenger. The tables are listed in the order in which they are to be datafilled.

#### Datafill tables required for Call Messenger

Table	Purpose of table
IBNXLA	IBN translation. This table contains the data for the digit translation of calls from an MDC station, an attendant console, an incoming, or an incoming side of a two-way trunk group.
CMSGCTRL	Call messenger control. This table defines which carriers can be used to carry call messenger traffic and the conditions under which that traffic is carried.

### Datafilling table IBNXLA

The following table shows the datafill specific to Call Messenger for table IBNXLA selector FEAT. Only those fields that apply directly to Call

**Call Messenger** (continued)

Messenger are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table IBNXLA (Sheet 1 of 2)**

<b>Field</b>	<b>Subfield or refinement</b>	<b>Entry</b>	<b>Explanation and action</b>							
KEY		see subfields	Key. This field consists of subfields XLANAME and DGLIDX.							
	XLANAME	alphanumeric (1 to 8 characters)	Translator name. This subfield consists of the translator name. Enter the name that is assigned to the translator.							
	DGLIDX	vector of up to 18 digits	Digilator index. This subfield consists of the digilator index. Enter the digit(s) 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:  <table border="0"> <tr> <td><i>MAXDIG value</i></td> <td><i>IBNXLA digilator values</i></td> </tr> <tr> <td>9</td> <td>Digits 0 to 9</td> </tr> <tr> <td>C</td> <td>Digits 0 to 9 and B to C</td> </tr> <tr> <td>F</td> <td>Digits 0 to 9 and B to F</td> </tr> </table> <p>The allowable digit range for table IBNXLA digilator values is determined for each translator.</p>	<i>MAXDIG value</i>	<i>IBNXLA digilator values</i>	9	Digits 0 to 9	C	Digits 0 to 9 and B to C	F
<i>MAXDIG value</i>	<i>IBNXLA digilator values</i>									
9	Digits 0 to 9									
C	Digits 0 to 9 and B to C									
F	Digits 0 to 9 and B to F									
RESULT		see subfields	Result. This field consists of subfields TRSEL, ACR, SMDR, VCDR, and FEATURE.							
	TRSEL	FEAT	Translation selector. This subfield consists of the translation selector. Enter the translation selector FEAT.							
	ACR	ACR	Account code entry. This subfield consists of the account code entry. Enter Y if an account code entry is required for all calls to the special feature access code. Otherwise, enter N. Enter N when the feature is equal to SCPL or SCPS.							

**Call Messenger** (continued)

Datafilling table IBNXLA (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	SMDR	Y or N	<p>Station message detail recording. This subfield specifies whether SMDR is required. 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.</p> <p><b>Note:</b> If field SMDR is set to Y, only the feature that originates a call is SMDR recorded. For features that do not originate calls, this field has no effect and no SMDR record is produced.</p> <p>For dump and restore purposes an N must be datafilled after field SMDR if field TRSEL is datafilled NET, ROUTE, TTTR, AMBI, EXTN, CUTTD, or FEAT. This N is the datafill for field VCDR.</p> <p>Fields SMDR [SMDR and SMDRB (field TRKSEL set to NET)] can only be set to Y if the switching unit has option SMDR_OFFICE set to Y in table OFCOPT.</p> <p>SMDR bills each leg of the call. The option must be turned on in table IBNXLA to generate SMDR billing. Turning on the option for one leg of the call does not carry over to another leg of the call. For example, when using 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 table IBNXLA. Neither SMDR nor SMDRB can be turned on for calls originating from POTS VFGs.</p>
	VCDR	Y or N	<p>Variable call detail recording. This subfield specifies if variable call detail recording is required. Enter N. N is the only valid entry for translation selector FEAT.</p>
	FEATURE	SCMSG or ICMSG	<p>Feature. This subfield consists of a valid feature. Enter a valid feature from the list below:</p> <ul style="list-style-type: none"> <li>• SCMSG (Standard Call Messenger)</li> <li>• ICMSG (Intentional Call Messenger)</li> </ul>



**Call Messenger** (continued)

**Datafill example for table IBNXLA**

The following example shows sample datafill for table IBNXLA.

**MAP display example for table IBNXLA**

KEY	RESULT
RESGRP	11 STAR
RESGRP	43 FEAT N Y N SCMSG
RESGRP	44 FEAT N Y N ICMG

**Datafilling table CMSGCTRL**

The following table shows the datafill specific to Call Messenger for table CMSGCTRL. Only those fields that apply directly to Call Messenger are shown. For a description of the other fields, refer to the data schema section of this document.

**Datafilling table CMSGCTRL (Sheet 1 of 2)**

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		1 to 16 alphanumeric characters	The name of the carrier. This field consists of the carrier name. The name can be 1- to 16-alphanumeric characters.
ACCESS		see subfields	Access. This field specifies the IEC.  INFOTYPE=CARRIER stores specific information about the IEC. There is one tuple of this type per carrier offering the Call Messenger service. If INFOTYPE=CARRIER is entered, datafill subfields SCMSG, ICMG, OCMTREAT, and FANI.  INFOTYPE=LOCAL stores information about the local operating company offering the Call Messenger service. Only one instance of this tuple is allowed in the table. If INFOTYPE=LOCAL is entered, datafill subfields SCMSG, FANI, and RTEREF.
	SCMSG	Y or N	Standard call messenger. This subfield indicates that the carrier specified in field CARRNAME offers Standard Call Messenger.

## Call Messenger (end)

### Datafilling table CMSGCTRL (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	ICMSG	Y or N	International call messenger. This subfield indicates that the carrier specified in field CARRNAME offers Intentional Call Messenger.
	OCMTREAT	Y or N	OCM treatment. This subfield specifies whether OCM treatment is applied. When OCM screening fails, a value of Y indicates that Call Messenger error treatment is applied. A value of N indicates that the call is routed to the messaging service.
	FANI	2 characters	Flexible automatic number identification. This subfield specifies a 2-digit ANI identifier used by carriers to differentiate Call Messenger traffic from other types of traffic. This ANI ID overwrites the line's assigned ANI ID (from field FANIDIGS in table LINEATTR) in the signaling information that is to be outpulsed toward the IEC's messaging service. The operating company ensures that the ANI ID used for CMSG is not used for another service within its network.
	RTEREF	table name and 0 to 1023	Route reference. This is an index into the office route tables (OFRT, OFR2, OFR3, OFR4) for trunk and connection information needed to reach the IEC's messaging service.

### Datafill example for table CMSGCTRL

The following example shows sample datafill for table CMSGCTRL.

### MAP display example for table CMSGCTRL

CARRNAME	ACCESS	FANI	RTEREF
CARRIERONE	CARRIER Y N Y	48	OFRT 79
CARRIERTWO	CARRIER Y Y Y	10	OFR3 150
LOCAL	LOCAL Y	12	OFRT 56

### Translation verification tools

Call Messenger does not use translation verification tools.

### SERVORD

Call Messenger does not use service order (SERVORD).

---

## 8 Datafilling XLAS Translations

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The following chapter describes the XLAS Translations, XLAS0001, functionality.

## Random and Circular Hunting

---

### Ordering codes

Functional group ordering code: XLAS0001

Functionality ordering code: XLAS0008

### Release applicability

MMP15 and up.

NA014 and up.

Release EUR008 introduced Random and Circular Hunting.

### Requirements

Random and Circular Hunting has no functional group requirements.

### Description

The random and circular hunting feature allows the even distribution of calls across a set of trunk groups. Release EUR008 introduced table SUPERTKG to the translation and routing system. Table SUPERTKG associates up to 220 trunk groups into a super-group. The table enables the switch to allocate calls evenly across the trunks in the super-group.

### Operation

Table SUPERTKG consists of a maximum of 255 tuples. Each tuple has a super-group name (SUPERTKG\_NAME) and a maximum of 220 trunk group names (TRKGRPS). The trunk group names are defined in table TRKGRP. A trunk group name can appear in more than one tuple and more than once in the same tuple.

When a tuple is added, it is allocated the first free location within the table, such as where one was previously deleted. When a tuple is deleted, a check is made to ensure that it is not being used by any other routing table. A tuple is changed by adding a new trunk group to the end of the list, by adding a dollar sign (\$) to terminate the list of trunk groups at the current point, or by changing the current trunk group name to another valid name.

*Note:* A tuple must have at least one trunk group in the TRKGRPS field.

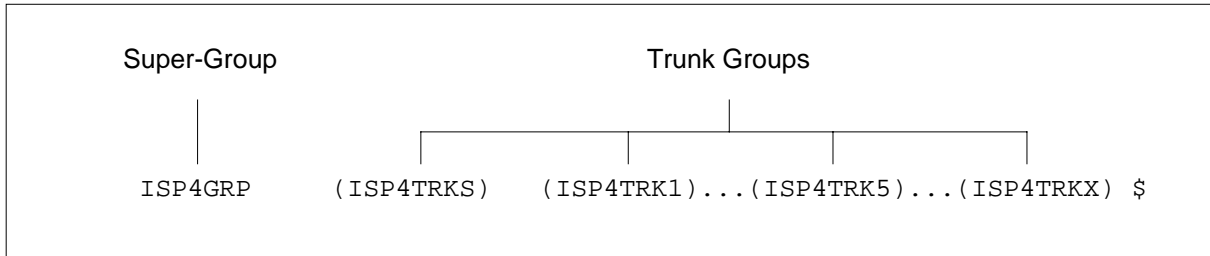
Refer to the following example.

---

## Random and Circular Hunting (continued)

---

### Example of table SUPERTKG



### Cyclic distribution method

A call is routed to table IBNRTE tuple 155. This starts a cyclic (CYC) search in table SUPERTKG, tuple ISP4GRP1. In this example, the call is routed to ISP4TRK2. The next call attempts to route on ISP4TRK3, the next on ISP4TRK4, and so on. If the previous call attempted to route on the last trunk group (ISP4TR30) in the super-group, the current call tries to route from the first trunk group (ISP4TRK1) in the super-group.

Refer to the following example.

### Example of cyclic distribution method

<b>Route table IBNRTE:</b>	
155 (SG CYC 10 ISP4GRP1 \$)	(SG RND 10 ISP4GRP2 \$) \$
<b>SUPERTKG table:</b>	
ISP4GRP1 (ISP4TRK1) (ISP4TRK2) (ISP4TRK3) (ISP4TRK4) ... (ISP4TR30) \$	
ISP4GRP2 (ISP4TR31) (ISP4TR32) (ISP4TR33) ... (ISP4TR60) \$	
<b>Trunk group status:</b>	
ISP4TRK1	No free trunks
ISP4TRK2	No free trunks
ISP4TRK3	No free trunks
...	
ISP4TR30	No free trunks

### Random distribution method

A call is routed to table IBNRTE tuple 155. The call starts a random (RND) search in table SUPERTKG, tuple ISP4GRP1. In this example, the call is routed to ISP4TRK2. The next call attempts to route on any trunk group within the tuple. Each trunk group has an equal chance of being chosen as the starting point.

Refer to the following example.

## Random and Circular Hunting (continued)

---

### Example of random distribution method

**Route table IBNRTE:**

```
155 (SG RND 10 ISP4GRP1 $) (SG RND 10 ISP4GRP2 $) $
```

**SUPERTKG table:**

```
ISP4GRP1 (ISP4TRK1) (ISP4TRK2) (ISP4TRK3) ... (ISP4TR30) $  
ISP4GRP2 (ISP4TR31) (ISP4TR32) (ISP4TR33) ... (ISP4TR60) $
```

### Finding a trunk group with a free trunk

A call is routed from a routing table to table SUPERTKG, tuple ISP4GRP1.

With the cyclic or random distribution method, the call attempts to route on ISP4TRK2. However, ISP4TRK2 has no free trunks, so the call attempts to route to ISP4TRK3. This trunk group does have free trunks and the call is routed to a free trunk within this trunk group.

In this example, the call attempts to route to ISP4TR30. This trunk group has no free trunks; the call attempts to route to ISP4TRK1. But ISP4TRK1 has no free trunks; the call attempts to route to ISP4TRK2. But ISP4TRK2 has no free trunks; the call attempts to route to ISP4TRK3. Trunk group ISP4TRK3 has free trunks and the call is routed to a free trunk within this trunk group.

Refer to the following example.

### Example of a finding a trunk group with a free trunk

**SUPERTKG table:**

```
ISP4GRP1 (ISP4TRK1) (ISP4TRK2) (ISP4TRK3) ... (ISP4TR30) $  
ISP4GRP2 (ISP4TR31) (ISP4TR32) (ISP4TR33) ... (ISP4TR60) $
```

**Trunk group status:**

```
ISP4TRK1 No free trunks  
ISP4TRK2 No free trunks  
ISP4TRK3 Free trunks  
...  
ISP4TR30 No free trunks
```

### Unable to find a trunk group with a free trunk

A call starts a random (RND) search in table SUPERTKG, tuple ISP4GRP1. In this example, the call attempts to route on ISP4TRK2. This trunk group has no free trunks; the call attempts to route on ISP4TRK3. But ISP4TRK3 has no free trunks; the call attempts to route on ISP4TRK1. But IPS4TRK1 has no

---

## Random and Circular Hunting (continued)

---

free trunks and the call cannot be routed to any trunk group of this super-group. Therefore, the next super-group in the routing table is attempted.

Refer to the following example.

### Example of unable to find a trunk group with a free trunk

**Route table IBNRTE:**

```
155 (SG RND 3 ISP4GRP1 $) (SG RND 10 ISP4GRP2 $) $
```

**SUPERTKG table:**

```
ISP4GRP1 (ISP4TRK1) (ISP4TRK2) (ISP4TRK3) $
ISP4GRP2 (ISP4TR31) (ISP4TR32) (ISP4TR33) ... (ISP4TR60) $
```

**Trunk group status:**

```
ISP4TRK1      No free trunks
ISP4TRK2      No free trunks
ISP4TRK3      No free trunks
```

### Exceeding the ATTEMPTS parameter

A call starts a cyclic (CYC) search in table SUPERTKG, tuple ISP4GRP1. In tuple ISP4GRP1, the attempt number (ATTEMPTS) is 3.

In this example, the call attempts to route on ISP4TRK1. But ISP4TRK1, ISP4TRK2, and ISP4TRK3 have no free trunks. The call has used its maximum number of attempts to route to a trunk group in this super-group. The call moves to the next super-group with an SG selector in the route table tuple.

The next cyclic (CYC) search in table SUPERTKG, tuple ISP4GRP1, starts at trunk group ISP4TRK4.

Refer to the following example.

## Random and Circular Hunting (continued)

---

### Example of exceeding the ATTEMPTS parameter

**Route table IBNRTE:**

```
155 (SG CYC 3 ISP4GRP1 $) (SG RND ISP4GRP2 $) $
```

**SUPERTKG table:**

```
ISP4GRP1 (ISP4TRK1) (ISP4TRK2) (ISP4TRK3) (ISP4TRK4) ... (ISP4TR30) $  
ISP4GRP2 (ISP4TR31) (ISP4TR32) (ISP4TR33) ... (ISP4TR60) $
```

**Trunk group status:**

```
ISP4TRK1      No free trunks  
ISP4TRK2      No free trunks  
ISP4TRK3      No free trunks  
...  
ISP4TR30      No free trunks
```

### Enhancements for MMP15/NA014 and up

As of MMP15/NA014, subfield OPTIONS and option DMI (digit manipulation index) is added to the SG selector in the routing tables (IBNRTE, IBNRT2, IBNRT3, IBNRT4, OFRT, OFR2, OFR3, OFR4, and xxRTE). The DMI option allows the switch to manipulate digits and called party number characteristics. The ability to manipulate digits uses table DIGMAN and its associated functionality. Table DIGMAN can add, remove, or replace digits, or change called party number characteristics, prior to outpulsing each call over a trunk.

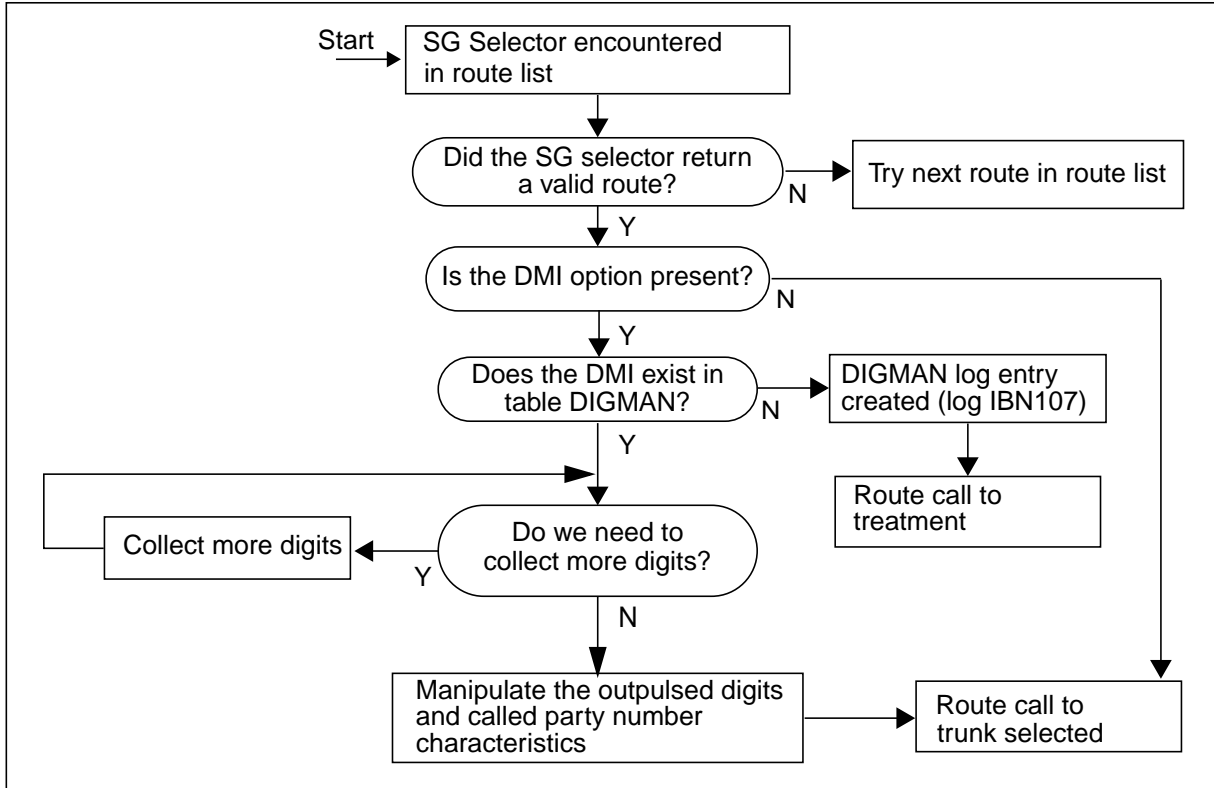
### Translations table flow

The flowchart that follows shows the interactions between the SG selector, table DIGMAN, and the routing of a call using the Random and Circular Hunting feature.



## Random and Circular Hunting (continued)

Table flow for Random and Circular Hunting



### Limitations and restrictions

Random and Circular Hunting does not affect the method of trunk selection within a trunk group. Trunk selection is controlled by datafill in table TRKGRP.

If a tuple in table SUPERTKG is accessed from the routing tables by both random and cyclic selectors, a cyclic search always starts with trunk group after the previous cyclic search, and not after the trunk group selected by a random search.

The call processing functionality in table DIGMAN cannot manipulate the digits of an overlap call until all the digits are present. If a call is an overlap call, the functionality causes the call to wait for all digits before any manipulation is carried out. When all the digits have been collected, an available trunk is searched for. This may result in a trunk being skipped over when the circular searching algorithm is used.

## Random and Circular Hunting (continued)

---

If a call commences as overlap and encounters the super trunk group functionality including the DIGMAN option, the call is forced to become en-bloc.

If all the digits have not been received when the super trunking functionality is encountered with the DIGMAN option, the call is returned to translations for more digits to be collected. After all the digits have been collected, the next available trunk is selected from the super trunk group.

### Interactions

Random and Circular Hunting does not interact with other functionalities.

### Activation and deactivation by the end user

Random and Circular Hunting does not require activation or deactivation by the end user.

### Billing

Random and Circular Hunting does not affect billing.

### Station Message Detail Recording

Random and Circular Hunting does not affect Station Message Detail Recording.

### Office parameters used by Random and Circular Hunting

Random and Circular Hunting does not affect office parameters.

### Datafill sequence

The table that follows lists the tables that require datafill to put Random and Circular Hunting into operation. You must enter data into the tables in this order.

#### Datafill requirements for Random and Circular Hunting (Sheet 1 of 2)

Table	Purpose of table
TRKGRP	Trunk Group table
SUPERTKG	Super Trunk Group table

## Random and Circular Hunting (continued)

### Datafill requirements for Random and Circular Hunting (Sheet 2 of 2)

Table	Purpose of table
DIGMAN	Manipulate digits during call processing
Routing tables	IBNRTE, IBNRT2 to IBNRT4, OFRT, OFR2 to OFR4, OVR1 to OVR39, FNPACONT (RTEREF), HNPACONT (RTEREF), ACRTE, PXRTE, CTRTE, FARTE, OFCRTE, AMRTE, FTRTE, NSCRTE, CCRTE, CTYRTE, NNRTE, and VPNRTE  Note: Tables IBN, OFR, HNP, and FNPA are the only tables supported in North America.

### Datafill related to table SUPERTKG

The table that follows shows the datafill related to Random and Circular Hunting for table SUPERTKG.

#### Datafill related to table SUPERTKG

Field	Subfield	Entry	Explanation and action
SGNAME		1 to 16 alphanumeric characters	Super trunk group name. Enter a name for the super trunk group.
TRKGRPS		alphanumeric	Trunk group names. Enter between 1 and 220 trunk group names from table TRKGRP.

### Datafill example for table SUPERTKG

The figure that follows shows sample datafill for table SUPERTKG.

#### MAP example for table SUPERTKG

SGNAME	TRKGRPS
-----	
SUPERGRP1	( ISP4TRK1) ( ISP4TRK2) \$

### Datafill related to universal routing

The table that follows shows the datafill related to Random and Circular Hunting for universal routing tables. This table includes only those fields that apply to Random and Circular Hunting.



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## Random and Circular Hunting (continued)

---

### Datafill related to IBN routing tables

The table that follows shows the datafill related to Random and Circular Hunting for IBN routing tables. This table includes only those fields that apply directly to Random and Circular Hunting.

The IBN routing tables are IBNRTE and IBNRT2 to IBNRT4.

*Note:* The subfield names may be slightly different in individual tables.

### Datafill related to IBN routing tables

Field	Subfield	Entry	Explanation and action
IBNRTSEL	SG	see subfield	Enter SG (super trunk group) and datafill refinements ALGORITHM, ATTEMPTS, SUPERTKG_NAME, and OPTIONS.
	ALGORITHM	CYC or RND	Algorithm. Enter CYC (cyclical) if the first trunk group to be tested is selected in sequence for each call routing through the super-group.  Enter RND (random) if the first trunk group to be tested is selected at random for each call routing through the super-group.
	ATTEMPTS	numeric (1 to 220)	Attempt number. The maximum of trunk groups to be tested for a free trunk member.
	SUPERTKG_NAME	alphanumeric (1 to 16 characters)	Super-group name. Enter a name for the super-group.
	OPTIONS	OPTION	Enter up to two options. End the list with a dollar sign (\$).  The DMI option can be datafilled twice in a single tuple and both options will be displayed at the time of confirmation. However, the last DMI option entered is displayed when the tuple is listed.
	DMI	numeric (1 to 32 767)	Manipulation of called number characteristics. Enter an index to table DIGMAN. This option allows the called number characteristics to be manipulated by the action of table DIGMAN. Table DIGMAN can, for example, specify that certain digits are replaced by other digits during translations.

---

## Random and Circular Hunting (end)

---

### Datafill example for IBN routing tables

The figure that follows shows sample datafill for table IBNRTE.

#### MAP example for table IBNRTE

RTE	RTELIST OPTIONS
-----	
811	( SG RND 10 SUPERGRP1 \$)\$

### Translation verification tools

You can use the TRAVER or the TRNSLVF tools to verify the operation of the DMI option when used with the SG selector. If you use TRAVER or TRNSLVF with the TRACE option, the DMI tuple in table DIGMAN is displayed after the SG tuple in table SUPERTKG.

The TRAVER command with the TRACE option displays tuples from table SUPERTKG. TRAVER output stops the display at the routing table tuple.

A TRAVER command with option “NT” does not display a path.

### SERVORD

Random and Circular Hunting does not use the Service Order system (SERVORD).

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