Critical Release Notice

Publication number: 297-2401-202
Publication release: Standard 02.02

The content of this customer NTP supports the SN06 (DMS) software release.

Bookmarks used in this NTP highlight the changes between the baseline NTP 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 baseline NTP remains unchanged and is valid for the current release.

Bookmark Color Legend

Black: Applies to new or modified content for the baseline NTP 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.

Attention!
Adobe Ⓡ Acrobat Ⓡ Reader ™ 5.0 is required to view bookmarks in color.

Publication History

September 2005

      Standard release 02.02 for software release SN06 (DMS).

      Updates were made to description for subfield L1FLAGS in section "PRI Trunk Datafill", "Datafilling Table TRKSGRP", according to CR Q01112597.

May 2003

      Standard release 02.01 for software release SN06 (DMS).

      Updates were according to CR Q00270160 and Q00588753.

297-2401-202

DMS-100 Family

NTNA ISDN Primary Rate Interface (PRI) NI-1

Service Implementation Guide

NA015   Standard   01.01   May 2001

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DMS-100 Family

NTNA ISDN Primary Rate Interface (PRI) NI-1

Service Implementation Guide

Publication history

May 25, 2001

Version 01.01 represents the initial standard version of the NA015 NTNA ISDN Primary Rate Interface (PRI) Service Implementation Guide (SIG).

Contents

Part IV Call Routing   IV-1

Part V Facility Related Features   V-1

Part VI ISP Data Related Features   VI-1

Part VIII Maintenance   VIII-1

About this guide

When to use this guide

This guide is an overview of the software release NA015 for the DMS-100 NTNA Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) product.

This guide is divided into the following parts:

- Part I: Introduction
- Part II: Planning and Engineering
- Part III: Provisioning
- Part IV Call Routing
- Part V Facility Relared Features
- Part VI ISP Related Features
- Part VII Private Branch Exchange (PBX) Related Features
- Part VIII: Maintenance

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the *next* software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but rereleased in the same software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release

information in *DMS-10 and DMS-100 Family Product Documentation
Directory*, 297-8991-001.

This document is written for DMS-100 Family offices. More than one version
of this document may exist. To determine whether you have the latest version
of this document and how documentation for your product is organized, check
the release information in DMS-10 and DMS-100 Family Product
Documentation Directory, 297-8991-001.

References in this document

Because the Nortel products comprise an extensive amount of existing
documentation, it is not possible to reproduce all the operational, maintenance,
engineering, and descriptive information already available in the library.
Therefore, this document contains references to existing Nortel documentation
to direct the reader to comprehensive information describing products as
applicable.

Documentation numbering conventions

Nortel's DMS documentation is frequently referred to as Northern Telecom
Publications (NTP). The NTPs follow a specific numbering system, such as

XXX-YYYY-ZZZ

The division number, XXX, indicates the common family of product
functionality.

The layer number, YYYY, indicates the product computing module (CM) load
(PCL) in the specified switching family. Within the documentation structure,
the document layer number depends on the PCL number for the specific
software load.

The key number, ZZZ, indicates the type of NTP, according to the specified
area for the switch or group number. Group numbers range from 000-899.

Table 1 lists NTP layer numbers and their corresponding PCLs or product
names.

Table 1 Document layer number table (Sheet 1 of 3)

Document layer number	PCL or product	PCL name or product name
8001	LEC/LECB	U.S. stand-alone DMS-100/200
8011	CDN/CDNB	Canadian stand-alone DMS-100/200
8021	LET/LETB	U.S. DMS-100/200 TOPS Combination

Table 1 Document layer number table (Sheet 2 of 3)

Document layer number	PCL or product	PCL name or product name
8041	UK/EUR	European DMS-100
8051	ABSM	Advanced Business Services (ABSM=Australia, China, and Cala)
8061	ABSL	Advanced Business Services (ABSK=IDC only)
8071	ATVB	Canadian stand-alone DMS-100/200 AUTOVON
8081	LATB	North American DMS200
8091	LWW	DMS-100 Wireless
8101	STPBASE	Signaling Transfer Point Base
8111	STPMDR7	Signaling Transfer Point MDR7
8121	STPSEAS STP	Signaling Engineering and Administration System
8201	RLCM/OPM	Remote Line Concentrating Module/Outside Plant Module
8211	OPAC	Outside Plant Access Cabinet
8213	OPAC	International Outside Plant Access Cabinet
8221	RSC	Remote Switching Center
8231	SCM-100S	Subscriber Carrier Module-100S
8241	SCM-100U	Subscriber Carrier Module-100 Urban
8251	SCM-100A	Subscriber Carrier Module-100 Access
8253	SCM-100A	Subscriber Carrier Module-100 Access (MVI-20)
8261	RSCS	Model A Remote Switching Center-SONET Model A (DS1)
8263	SCM-100A	Subscriber Carrier Module-100 Access Maintenance Manual
8271	RSCS Model A	Remote Switching Center-SONET Model A (PCM30)

Table 1 Document layer number table (Sheet 3 of 3)

Document layer number	PCL or product	PCL name or product name
8281	RSCS Model B	Remote Switching Center-SONET Model B (DS1)
8291	RSCS Model B	Remote Switching Center-SONET Model B (PCM30)
8301	SCM-100SR	Subscriber Carrier Module-100S Remote
8311	Host XPM	Host Extended Peripheral Module
8321	XPM	Extended Peripheral Module (DS1)
8331	XPM	Extended Peripheral Module (PCM30)
8341	TOPS	Traffic Operator Position System Message Switch
8411	USTOPS	Traffic Operator Position System (Stand-alone U.S.)
8421	CDMTOPS	Traffic Operator Position System (Stand-alone Canadian)
8501	SCP	Service Control Point
8601	DMSGL002	DMS Global
8991	PCL common misc.	PCL common and maintenance

Table 2 lists NTP types and their associated key numbers.

Table 2 Document key number table (Sheet 1 of 2)

NTP type	Key number
Translations Guide	350
Alarm and Performance Monitoring Procedures	543
Trouble Locating and Clearing Procedures	544
Recovery Procedures	545
Routine Maintenance Procedures	546
Card Replacement Procedures	547
XPM Maintenance Manual (remotes only, layers 8201-8331)	550

Table 2 Document key number table (Sheet 2 of 2)

NTP type	Key number
Feature Description Manual	801
Peripheral Module Software Release Document	599
Hardware Description Manual (PCL common/misc. only, layer 8991)	805
Service Order Reference Manual	808
Operational Measurements Reference Manual (all PCLs and XPM)	814
XPM Translations Reference Manual	815
Automatic Message Accounting Bulletin	830
Log Reports Reference Manual	840
Office Parameters Reference Manual	855
Software-to-Data Cross Reference	856

In addition to NTPs, Nortel provides System Engineering Bulletins (SEB) and System Engineering Alerts (SEA) that contain information on engineering the ISDN call processing functions. These documents present performance engineering rules, existing or new, in a simplified, user-oriented format. The information in these documents is product specific, PCL specific, or both.

The *DMS-10 and DMS-100 Family Product Documentation Directory, 297-8991-001,* is an excellent source listing of current NTPs for the DMS Family of switches.

What precautionary messages mean

The types of precautionary messages used in Nortel documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of precautionary message types follow:

ATTENTION Information needed to perform a task.

ATTENTION

If the unused DS3 ports are not deprovisioned before a DSI/VT Mapper is installed, the DS1 traffic will not be carried through the DS1/VT Mapper, even though the DS1/VT Mapper is properly provisioned.

DANGER Possibility of personal injury

DANGER
Risk of electrocution
Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high-voltage line. Until the fuses are removed, the high-voltage lines are active, and you risk being electrocuted.

WARNING Possibility of equipment damage

WARNING
Damage to the backplane connector pins
Align the card before seating it, to avoid bending the backplane connector pins. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

CAUTION Possibility of service interruption or degradation.

CAUTION
Possible loss of service
Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

Input prompt (>)

An input prompt (>) indicates information following is a command:

```
>BSY
```

Commands and fixed parameters

Commands and fixed parameters entered at a MAP terminal are shown in uppercase letters:

```
>BSY CTRL
```

Variables

Variables are shown in lowercase letters:

```
>BSY CTRL  ctrl_no
```

The letters or numbers the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the MAP display and are shown in a different type:

```
FP 3 Busy CTRL 0: Command request has been submitted.
FP 3 Busy CTRL 0: Command passed.
```

The following excerpt from a procedure shows the command syntax used in this document:

At the current location

1 To manually busy the CTRL on the inactive plane, type

```
>BSY CTRL  ctrl_no
```

and press the Enter key

where

ctrl_no is the number of the CTRL (0 or 1)

```
Example of a MAP response:
FP 3 Busy CTRL 0: Command request has
been submitted.
FP 3 Busy CTRL 0: Command passed.
```

Audience

This guide is intended for all audiences. However, information in some sections may be pertinent to specific audiences. For example, operating company management and sales agents may want to focus on the Overview, Applications, and Terminals sections. Operating company engineering,

installation, and support personnel may want to focus on the technical sections of the document.

Important notice

ISDN is a technology that requires development of additional skills to implement, operate, and maintain the DMS switch. This guide is designed to offer the user a quick and comprehensive overview of implementing ISDN. The guide is not a replacement for developing the appropriate level of knowledge within your company. Nortel offers a comprehensive set of documentation and training courses for ISDN. The following training courses are available through Nortel's training center.

Table 3 Training courses

Course number	Title
0170	Introduction to ISDN Computer-Based Training (CBT)
3400	Introduction to DMS SuperNode Translations (CBT)
0386	ISDN Basic Rate Interface Maintenance and Testing
0471	ISDN Engineering and Provisioning
0472	ISDN Translations
0476	ISDN Customer Premise Equipment (CPE)
0491	ISDN Advanced Testing and Protocols
7002	ISDN PRI Translations

A key part of ISDN includes customer premise equipment (CPE). There is a lot of very good CPE publicly available; however, some CPE may not be compatible with the DMS switch. Verify that the CPE you purchase is National ISDN compliant.

Part I
Introduction

Part I: "Introduction" contains the chapter, "ISDN PRI Overview."

1 ISDN PRI Overview

Introduction to ISDN

Integrated services digital network (ISDN) is a standard, all digital technology. ISDN allows for simultaneous, integrated voice and data capability over two-wire digital loops and four-wire digital trunks. These loops and trunks can access circuit-switched voice and data networks and network services databases.

For effective deployment, ISDN providers conform to National ISDN. National ISDN refers to the set of ISDN standards that apply to North America. The International Telephone and Telegraph Consultative Committee (CCITT), now known as the International Telecommunications Union (ITU), is a United Nations organization that coordinates and standardizes international telecommunications. ITU led the original effort that produced the initial, basic guidelines for implementing ISDN.

National ISDN commitments address the following three major areas:

- ISDN user equipment, such as computers, data terminals, and telephones, and the services used by this equipment.

- Standard operating company procedures and systems for the operation, administration, and maintenance of ISDN services and equipment.

- Standard communications among ISDN capable switches to extend ISDN services throughout the public-switched network.

These standards enable the operating companies to market a practical ISDN service, and the subscribers to be sure of stable terminals and services.

National ISDN gives switch and customer premises equipment (CPE) manufacturers a standard ISDN technology base for future product development. Network providers can install ISDN in their multi-vendor networks and market a portfolio of ISDN services nationwide. National ISDN gives users access to a predefined set of ISDN features from virtually any operating company switch. There is also a selection of CPE and software from many different suppliers that best matches their individual needs.

Although National ISDN standardizes the basic elements of ISDN, there is still room for innovation and value-added services. Network providers can invent a new ISDN service, or a computer manufacturer can enhance its ISDN products. Over time, many of these enhanced services make their way into the standard feature set. For example, Nortel installs more than 200 centrex services on the standard ISDN line, using only those procedures and protocols defined by National ISDN. This approach allows for a standard technology platform with incentives and opportunities to add value.

The real ISDN revolution is that ISDN is available all across North America with a set of standardized services. This ISDN standardization frees subscribers from the premium cost of proprietary solutions.

National ISDN has energized the ISDN industry, stimulating demand for ISDN services and promoting the supply of ISDN hardware and software. Previously, the lack of ISDN telephones, data terminals, and compatible software had a damping effect on the deployment of ISDN throughout the telecommunications industry. Telephone operating companies were reluctant to market ISDN without a wide choice of terminals and a standard feature set. Hardware and software manufacturers were reluctant to develop products until ISDN was more widely marketed. National ISDN continues to drive widespread ISDN installation and development.

There are two types of ISDN interfaces offered in North America: primary rate interface (PRI) and basic rate interface (BRI). This documentation only addresses ISDN PRI.

ISDN PRI overview

PRI carries nB+D channels over a digital DS-1 facility (n=1-479, typically 23). PRI is used to link private networking facilities, such as private branch exchange (PBX), local area network (LAN) facilities, and host computers with standardized architecture. This architecture acts as the bridge between private switching equipment and the public network. The following gives a brief overview of the Nortel ISDN PRI product.

ISDN PRI background

National ISDN PRI was not defined until NI-2 (ten years after the initial PRI development). During that period, individual companies developed and used proprietary versions of PRI. Some examples are Nortel's NTNAPRI and AT&T's U449PRI and U459PRI. Because different versions of PRI existed, it required CPE to support several different variants of PRI. To overcome interoperability problems, companies such as Northern Telecom and AT&T developed protocol variants to enable their equipment to communicate with other PRI variants. These variants were more useful but supported only a basic call.

Northern Telecom North American Primary Rate Interface (NTNAPRI) is defined by the NIS-A211-1 Interface Specification.

Nortel's NI-2 compliant PRI is called National ISDN (NIPRI) and is defined by the NIS-A233-1 Interface Specification. NI-2 PRI is an industry effort to standardize PRI features and protocol. A standard interface has the advantage of more CPE manufacturers being able to invest in research and development required to build a reliable interface. NI-2 PRI is the industry's attempt to standardize PRI at a minimum feature level. Nortel's NA009 release of NIPRI creates a full featured PRI.

ISDN PRI description

ISDN PRI is a trunking technology used as an interface between the switching center and CPE. PRI offers advantages over other trunking technologies in use, as listed below.

- An efficient use of facilities. Call-by-call on ISA integrated services access allows a group of trunks to serve multiple services such as WATS, FX, and TIE.

- Features such as calling number and name display.

- Faster call setup time, especially with multirate (DWS) vs. Bonding.

- Higer band width nX64k.

The following figure shows an example of Service Consolidation using an intergrated services access (ISA) configuration vs. Dedicated Facilities.

Figure 1-1 PRI integrated services access (ISA/call-by-call vs. Dedicted Facilities)
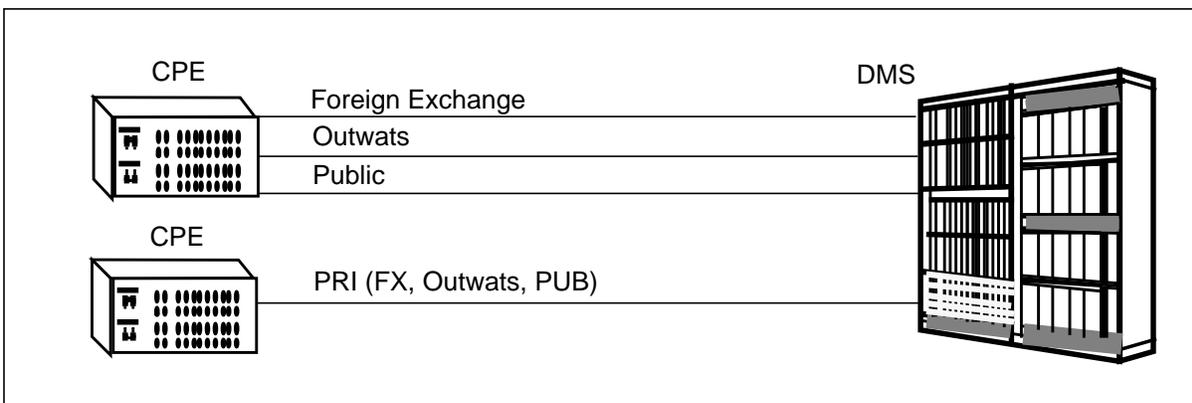
PRI uses out-of-band signaling similar to SS7, referring to its use of a separate channel (D-channel) for call control, and leaving the remaining channels for 64k clear traffic. The physical interface is a DS-1 carrier. The following figure illustrates PRI out-of-band messaging.

Figure 1-2 PRI out-of-band messaging
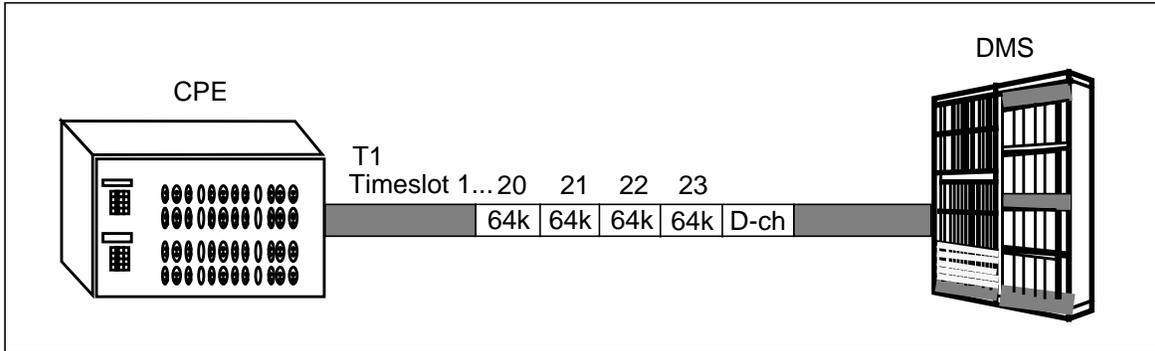
Two configurations for PRI, facility associated and non-facility associated (NFAS), are also referred to as 23B+D and NFAS, respectively. With facility associated PRI, a D-channel controls each DS1 span individually. With NFAS, one D-channel controls multiple spans. The concept is called nB+D. One D-channel can control as many as 20 DS-1 spans or 479 B-channels. With NFAS, there is also an option for a backup D-channel. The following figure shows examples of PRI configurations.

Figure 1-3 PRI configurations
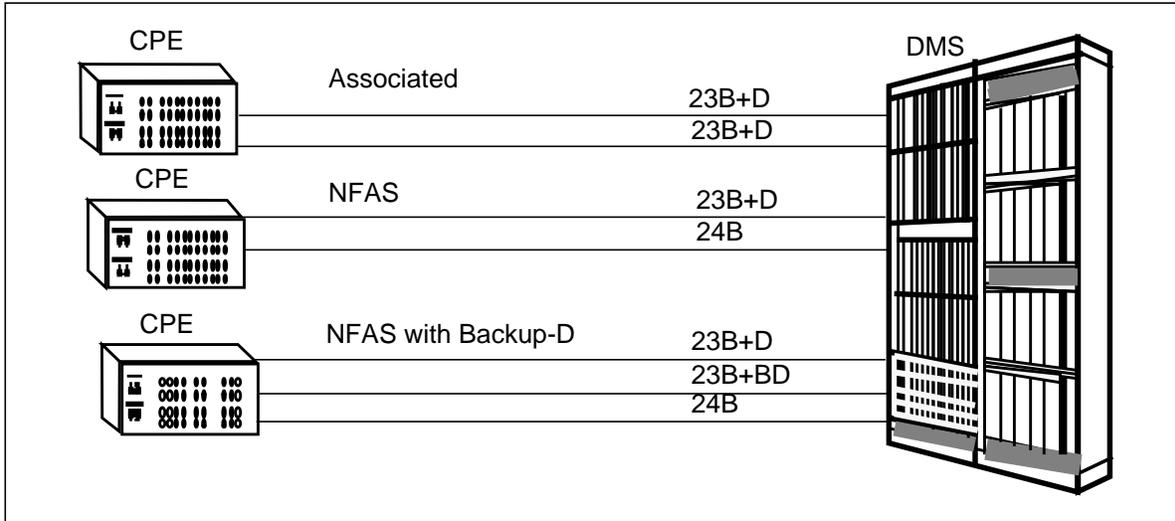
Applications

Applications fall into one of two categories; the traditional private branch exchange (PBX), or the customer premises equipment (CPE) designed for data for LAN connection and Internet access. All applications have similar datafill. The difference in application is based on the features that are required. A PBX

can be set up for all voice and data features, while routers can be set up for only data and facility features.

Figure 1-4 Application Drawing
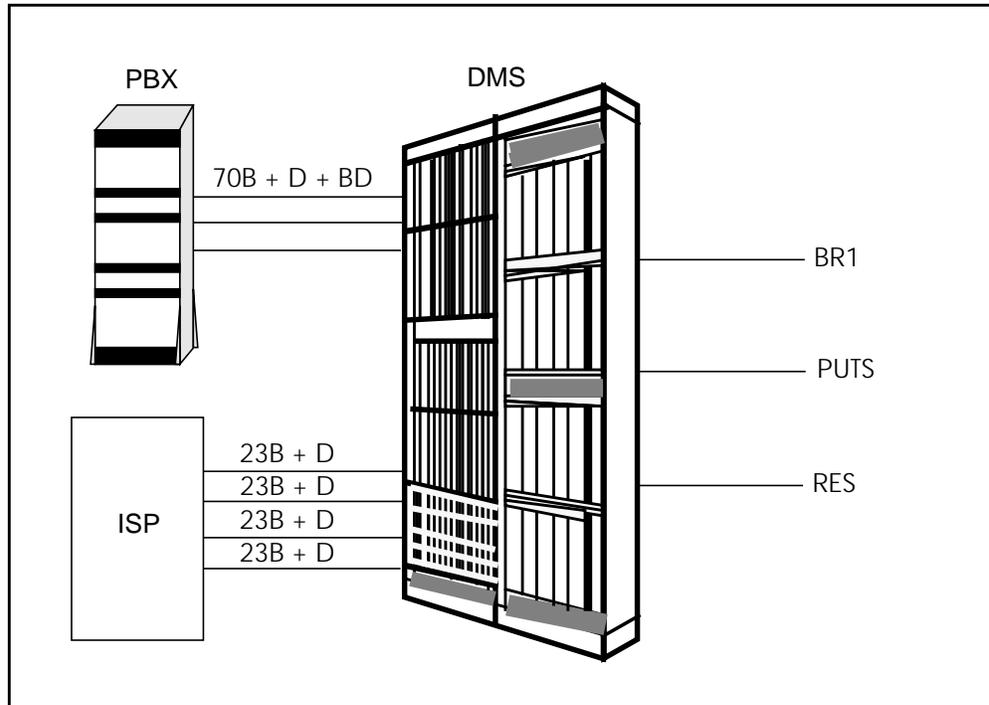
Part II
Planning and Engineering

Part II: "Planning and Engineering" contains the chapter, "Engineering and Provisioning."

2 Engineering and Provisioning

This chapter describes ISDN PRI provisioning guidelines.

Hardware

The DMS-100 uses the extended peripheral module (XPM) and spectrum peripheral module (SPM) to serve ISDN PRI. If the common peripheral is only equipped to serve trunks, it is called an ISDN digital trunk controller (DTCI). If the module is equipped for both lines and trunks, it is called a line trunk controller ISDN (LTCI). The SPM is a trunk-only peripheral module with data link controller (DLC) circuit packs available for ISDN. The DLC for SPM corresponds to the enhanced ISDN signaling preprocessor (EISP) for an XPM and handles the D-channel messaging. Both units support per-trunk signaling (PTS) trunks with the ABTRK software exec loaded on the Table LTCINV (XPM) or Table MNNODE (SPM).

DTCI

The XMS-based peripheral module product life upgrade strategy (XPM-PLUS) series 3 dual unit node ISDN digital trunk controller (DTCI) is an extended peripheral module integrated digital trunk carrier in which power and control for the 20 spans is performed from either of the two shelves. Unit 1 is the upper shelf. The following figure shows peripheral DS1s at the far left, control and common cards in the center, and the C-side interface to the far right. DS1 numbering starts at span zero (0) located in unit 0, slot 5, port 0 to span 19, in unit 1, slot 1, port 1.

Figure 2-1 XPM-PLUS dual unit node DTCI
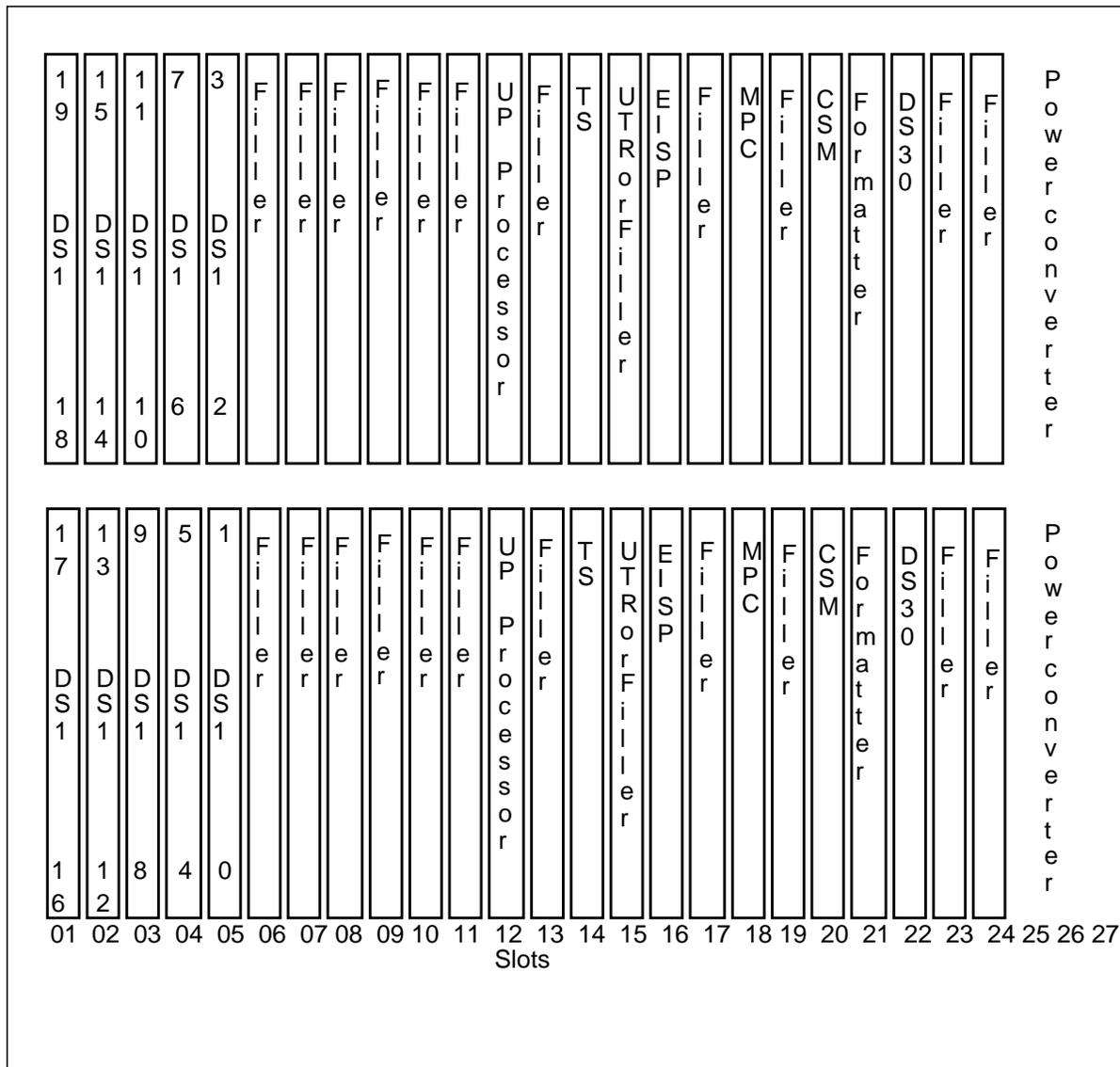
The following table shows the XMS-based peripheral module (XPM) circuit card list.

Table 2-1 XPM card list (Sheet 1 of 2)

Slot	Card code	Name	Purpose
1-5	NT6X50AB	DS1	Peripheral side interface
Others	NT0X50AA	Filler plate	Cosmetic
Note: Card codes are the latest version to date when this document was written.			

Table 2-1 XPM card list (Sheet 2 of 2)

Slot	Card code	Name	Purpose
12	NTSX05AA	UP	Processor
14	NT6X44AA	TS	Time switch
15	NT6X92BB	UTR	Universal tone receiver
16	NTBX01AB	EISP	Enhanced signaling processor D-channel
18	NT6X69AC	MPC	Message protocol and tone generator
20	NT6X42AA	CSM	Manages the speech link to ENET
21	NT6X41AA	Formatter	Converts parallel bit stream to/from DS30 bit stream for ENET messaging
22	NT6X40FA	DS30	C-side interface 30 channels
25-27	NT2X70AE	Power Supply	Supplies power to unit

Note: Card codes are the latest version to date when this document was written.

Software

Use the peripheral module (PM) release document for specific software with the PRAB and ABTRK execs. An example follows in the customer datafill table flow section in this chapter.

Spectrum peripheral module

The SPM is Nortel Networks' advanced peripheral platform. The SPM is similar to an XPM, but differs in that it connects to the ENET with higher capacity DS512 fibers and supports 84 DS1s through a fiber OC3 interface. An XPM has 20 copper DS1s as well as spares on a card and switches activity between entire units. The following figure shows the placement of cards. The CEM cards must be in slots 7 and 8. The OC3 cards must be in slots 10 and 11. The DLC and DSP cards can be placed in any of the other slots including shelf 1.

Figure 2-2 Placement of CEM and OC3 cards
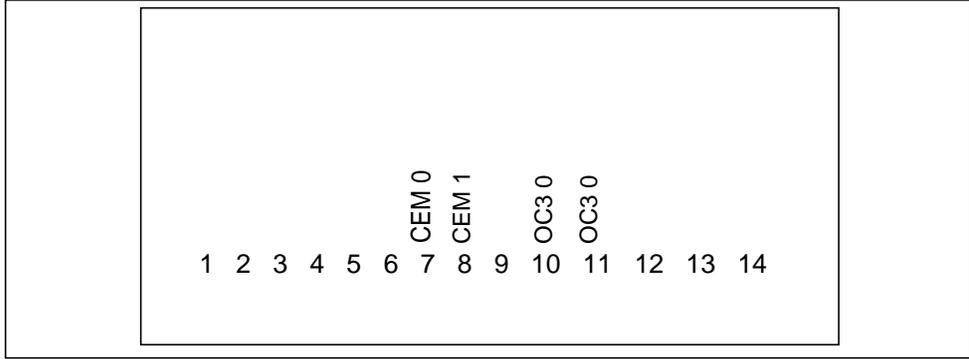
Hardware datafill

There is hardware datafill for both the XPM and SPM. The following figure shows the hardware tables that require datafill for an XPM.

Figure 2-3 Hardware tables requiring datafill for an XPM
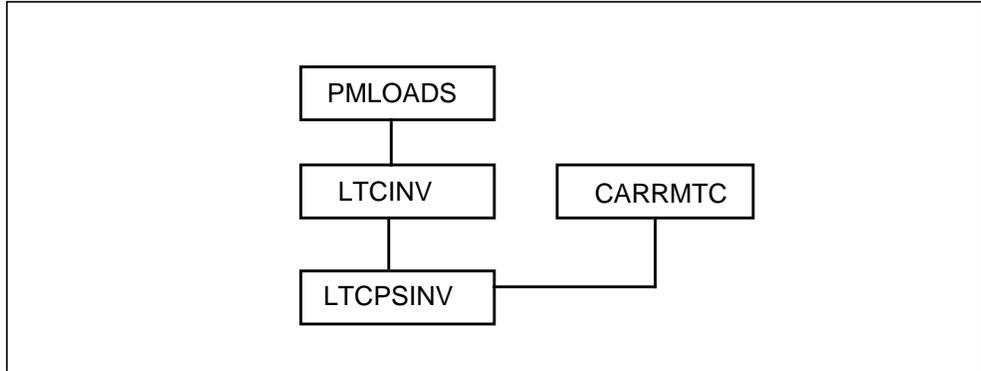
Tables PMLOADS, CARRMTC, LTCINV, and LTCPSINV define the hardware. The tables must be filled in the order listed. Each table is described in the following sections.

Table PMLOADS

Table peripheral module loads (PMLOADS) defines the location of the load for the PM, as shown in the following figure.

Figure 2-4 Example of Table PMLOADS

```
                      LOADNAME
                      ACTFILE        ACTVOL
                      BKPFILE        BKPVOL  UPDACT
- - - - - - - - - - - - - - - - - - - - - - - - - - - -
                      QLI05BC
                      QLI05BC  S01DPMLOADS
                      QLI05BC  S00DPMLOADS
```

The following table shows a description of the fields and settings in Table
PMLOADS.

Table 2-2 Description of Table PMLOADS

Field name	Description	Setting
LOADNAME	Load Name	Name found in Table LTCINV.
ACTFILE	Active File	Will search for this file first.
ACTVOL	Active Volume	
BKPFILE	Backup File	The DMS switch searches for this if Active is not found.
BKPVOL	Backup Volume	
UPDACT	Automatic Update	Y (Yes). Load file is eligible for patching .

Table CARRMTC

Table CARRMTC defines the characteristics of the carrier. Alarm and
Operational Measurement (OM) thresholds are also set here. The majority of
PRI links are set up, as shown in our example, with the following:

• Extended superframe format (ESF) as the frame format

• Binary 8 zero substitution (B8ZS) as the line coding

In the following figure, the values used are determined from experience. All
outside plant and network paths must be set up for 64k. The 56k option exists
but is rare.

Figure 2-5 Example of Table CARRMTC

```
CSPMTYPE     TMPLTNM  RTSML  RTSOL                                    ATTR
-----------------------------------------------------------------------
   DTCI          64K   255  255   DS1 NT6X50AB MU_LAW ESF B8ZS CRC NILDL
                                  N 250 1000 50 50 150 1000 3 6 864 100
                                  17 511 4 255

   DTCI          DWS   255  255   DS1 NT6X50AB MU_LAW ESF B8ZS CRC NILDL
                                  N 250 1000 50 50 150 1000 3 6 864 100
                                  17 511 4 255
```

The following table shows a description of the fields and settings in Table CARRMTC.

Table 2-3 Description of Table CARRMTC

Field name	Description	Setting
CSPMTYPE	Carrier Peripheral Module Type	CSPMTYPE - Enter DTCI or LTC.
TMPLTNM	Template Name - Template name of peripheral module. This name is used in the CARRIDX subfield in Table LTCPSINV.	TMPLTNM - 64KESF or DWS for dialable wideband service.
RTSML	Route Maintenance Limit	RTSML - 255
RTSOL	Route Out-Of-Service Limit	RTSOL - 255
ATTR	DS-1 selector (SELECTOR)	SELECTOR - DS1
	Card name (CARD)	CARD - NT6X50AB
	Voice Law (VOICELAW)	VOICELAW - MU_LAW
	Frame Format (FF)	FF - ESF
	Line Coding Scheme (ZLG)	ZLG - B8ZS
	Bit Error Rate Base (BERB)	BERB - CRC
	Data Link (DLK)	DLK - NILDL
	Inhibit Alarm Transmit (IAT)	IAT - N
	Local Carrier Alarm Stop Threshold (LCGAST)	LCGAST - 250
		LCGACL - 1000
	Local Carrier Group Alarm Clear Threshold	RCGAST - 50
		RCGACL - 50

Table LTCINV

Table LTCINV defines the DTCI software load, executive programs, network links, and hardware cards present.

Figure 2-6 Example of Table LTCINV

```
LTCNAME
   ADNUM   FRTYPE FRNO SHPOS   FLOOR   ROW FRPOS   EQPEC      LOAD
                                                              EXECTAB
                                                              CSLNKTAB
                                                              OPTCARD
   TONESET    PECS6X45
                    E2LOAD
                                                              OPTATTR
 PEC6X40                               EXTINFO
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  DTCI 2
     7       LTE   0    51       1   D    0  6X02AA  ELI05BC
                                   (ABTRK DTCEX)(PRAB DTCEX)$
(0 12 1 0) (0 12 1 1) (0 12 1 2) (0 12 1 3) (0 12 1 4) (0 12 1 5)
(0 12 1 6) (0 12 1 7) (0 12 1 8) (0 12 1 9) (0 12 1 10) (0 12 1 11)
(0 12 1 12) (0 12 1 13) (0 12 1 14) (0 12 1 15) $
                                   (DCTAX78)(UTR15)(MSG6X69)(ISP16)$
 NORTHAM       SX05AA     SX05AA

                                                                       $
 6X40FA                                N
```

The following table shows a description of the fields and settings in Table LTCINV.

Table 2-4 Description of Table LTCINV (Sheet 1 of 2)

Field name	Description	Setting
LTCNAME	Line Trunk Controller Name - This field is used to describe the peripheral module type (XPMTYPE) and peripheral number (XPMNO).	XPMTYPE - Enter DTCI or LTC. XPMNO - Enter a value of 0 to 255.
FRTYPE	Frame Type	FRTYPE - Enter DTE or SME.
LOAD	Load Name	LOAD - Enter the load name from the PMLOADS Table.

Table 2-4 Description of Table LTCINV (Sheet 2 of 2)

Field name	Description	Setting
EXETAB	Terminal Type (TRMTYPE) Executive Program (EXEC)	TRMTYPE - PRAB for PRI trunk EXEC - Enter DTCEX
OPTCARD	Optional Cards - The messaging card (MSG6X69) and the ISP signaling card (ISP16) are required for PRI operation.	OPTCARD - MSG6X69 and ISP16 DTCAX78 for dialable wideband

Table LTCPSINV

Table LTCPSINV assigns the DTCIs DS1 ports and references Table CARRMTC.

Datafill example

The following shows an example of Table LTCPSINV datafill.

Figure 2-7 Example of Table LTCPSINV

```
    LTCNAME                                    PSLNKTAB
-----------------------------------------------------------
    DTCI  2
      N (0 DS1PRA  DWS N 0 NIL) (1 DS1PRA DWS N 0 NIL)
        (2 DS1 DEFAULT N) (3 DS1PRA 64K N 0 NIL)
        (4 DS1PRA DEFAULT N 0 NIL) (5 DS1PRA 64K N 0 NIL)
        (6 DS1PRA 64K N 0 NIL) (7 DS1PRA 64K N 2 NIL)
        (8 DS1PRA 64K N 3 NIL) (9 DS1PRA 64K N 4 NIL)
        (10 DS1PRA 64K N 5 NIL) (11 DS1PRA 64K N 1 NIL)
        (12 DS1PRA 64K N 2 NIL) (13 DS1PRA 64K N 8 NIL)
        (14 DS1PRA 64K N 9 NIL) (15 DS1PRA 64K N 10 NIL)
        (16 DS1PRA 64K N 0 NIL) (17 DS1PRA 64K N 0 NIL)
        (18 DS1PRA 64K N 0 NIL) (19 DS1PRA 64K N 0 NIL) $
```

The following table shows a description of the fields and settings in Table LTCPSINV.

Table 2-5 Description of Table LTCPSINV

Field name	Description	Setting
LTCNAME	Line Trunk Controller Name - This describes the peripheral module type and number.	XPMTYPE - DTCI or LTC
		XPMNO - 0 to 255
PSLNKTAB	P-side table	
	P-side link (PSLINK)	Port number
	P-side data (PSDATA)	DS1PRA
	Carrier index (CARRIDX)	64k
	Action (ACTION)	N (do not remove the carrier from service if the maintenance thresholds are exceeded.)
	Interface Identifier (IID)	0 to 31
	Line Equipment (LINE_EQ)	NIL

Notice the following Interface Identifier (IID) conventions:

- IID 0 Span with primary D-channel
- IID 1 Span with backup D-channel
- IID 2 Spans with 24 B-channels in consecutive order

If the backup D-channel is not used, do not use IID 1.

If the PRI trunkgroup is only one span (i.e., 23B+D) the IID is not used.

Keep spans, IIDs, D-channels, and B-channels in ascending order.

The following figure illustrates the importance of the IID. The IID specifies the span on which a channel is located. For example, the CPE wants to establish a call on channel 5 (time slot 5) on span 3. The CPE sends a setup message requesting channel 5 on interface 3 (IID 3). When the DMS switch receives a call, it receives the call on channel 5 (time slot 5) on the span specified as IID 3. If the DMS switch datafills this span as IID 2 instead of IID 3, the call does not have a path. The IID datafill values must match on both sides of the link.

Figure 2-8 Description of the interface identifier (IID)
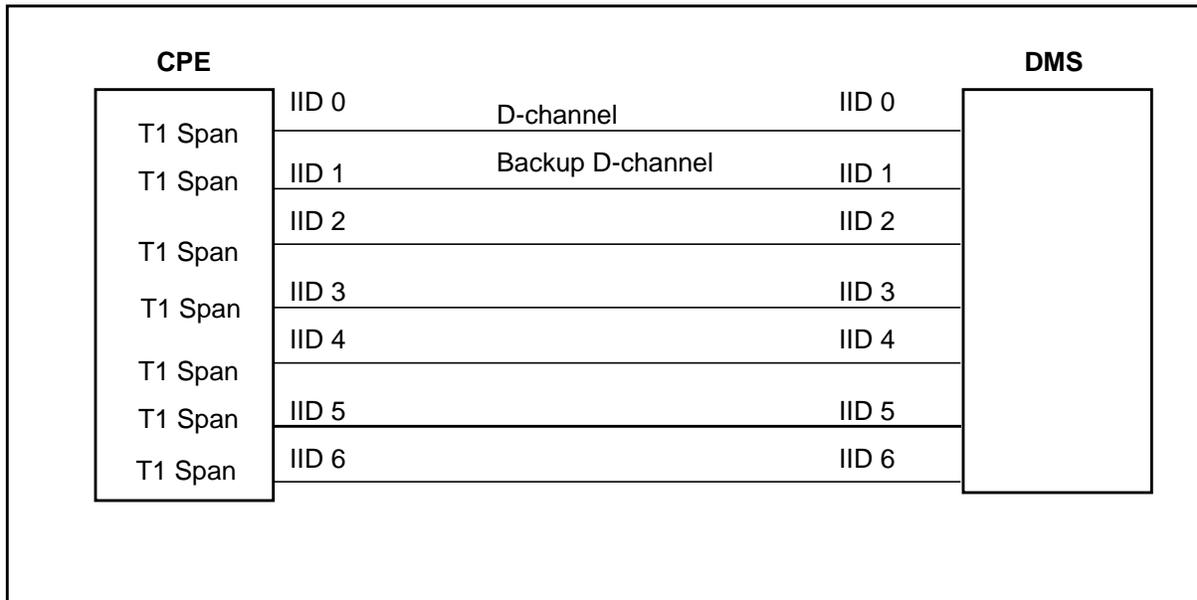
The following figure shows the hardware datafill tables for an SPM.

Figure 2-9 Hardware tables requiring datafill for an SPM

```
            ┌──────────────┐
            │   PMLOADS    │
            └──────────────┘
                   │
            ┌──────────────┐
            │   MNPRTGRP   │
            └──────────────┘
                   │
            ┌──────────────┐
            │    MNODE     │
            └──────────────┘
                   │
            ┌──────────────┐
            │   MNSHELF    │
            └──────────────┘
                   │
            ┌──────────────┐
            │   MNCKTPAK   │
            └──────────────┘
                   │
            ┌──────────────┐
            │    MNLINK    │
            └──────────────┘
                   │
            ┌──────────────┐
            │   MNHSCARR   │
            └──────────────┘
                   │
            ┌──────────────┐
            │   MNPRIID    │
            └──────────────┘
```
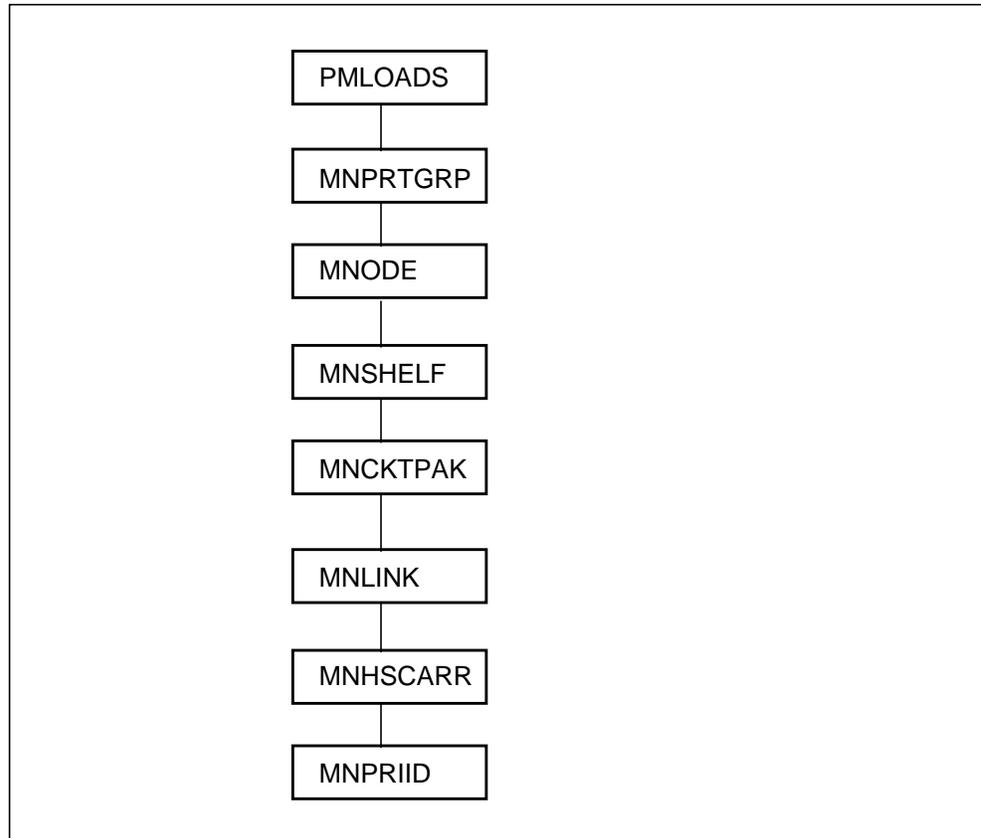
Table MNPRTGRP

Table MNPRTGRP (management network protection group) is one of six
DMS SPM configuration tables. Each tuple in this table identifies a protection
group for a set of circuit cards.

The following shows sample datafill for Table MNPRTGRP.

Figure 2-10 Example of Table MNPRTGRP

```
 GRPKEY                                                          GRPINFO
------------------------------------------------------------------------
 SPM 0    DSP_GRP   1    DSP_GRP       NRVTV         (NOSPARE MJ RPT)$
 SPM 0    VSP_GRP   1    VSP_GRP       NRVTV         (NOSPARE MJ RPT)$
 SPM 0    OC3_GRP   1    OC3_GRP       NRVTV         (NOSPARE MJ RPT)$
 SPM 0    STS3L_GRP 1    STS3L_GRP     1PLUS1 NRVTV   UNI_DIR
 SPM 0    DLC_GRP   1    DLC_GRP       NRVTV         (NOSPARE MJ RPT)$
```

The following table describes field names, subfield names, and valid data ranges for Table MNPRTGRP.

Table 2-6 Description of Table MNPRTGRP

Field	Subfield or refinement	Entry	Explanation and action
GRPKEY			Group Key. The subfields are NODETYPE, NODEID, GRPTYPE, and GRPID.
	NODETYPE	SPM	Node Type. Enter SPM.
	NODEID	0-63	Node Identifier. Enter the SPM node identifier. The default is 0.
	GRPTYPE	OC3_GRP, DSP_GRP, VSP_GRP, STS3L_GRP, DLC_GRP	Group Type. Enter the protection group type as follows: • OC3_GRP (protection group for OC3 circuit pack) • DSP_GRP (protection group for DSP circuit pack) • STS3L_GRP (protection group for STS3 line carrier) • DLC_GRP (protection group for Data Link Controller circuit pack)
	GRPID	1-28	Group Identifier. Enter the protection group identifier. The default value is 1.
GRPINFO	SELECTOR	VSP_GRP, OC3_GRP, DLC_GRP, DSP_GRP	Group Information. This protection group information area is refined for each group type: VSP_GRP, OC3_GRP, DLC_GRP, DSP_GRP, or STS3L_GRP. Refer to the following refinements.
	APSCFG	1 PLUS 1	Protection Switch Configuration
	SWCHMODE	NRVTV	
	ALRMCTRL	$	Alarm Control $ Default
	SWCHDIR	UNI_DIR	Protection Switch Direction

Table MNNODE

Table MNNODE (management network node) includes the node identifier and the node location.

The following shows sample datafill for Table MNNODE.

Figure 2-11 Example of Table MNNODE

```
NODEKEY      ALIAS    NODEINFO
-----------------------------------------------------------------------
SPM     0    $ DMSCP 1 SNYC LOOP 15 (COT  60) (DTMF 60) (ECAN 60)
(TONESYN 60) (MF 60) $ (SYSB CR RPT) (MANB MJ RPT) (ISTB MN RPT) (SYSBNA
CR RPT) (MANBNA MJ RPT) (COTLOW MN RPT) (DTMFLOW MN RPT) (ECANLOW MN RPT)
(TONESLOW MN RPT) (MFLOW MN RPT) $(ABTRK SPMEX)(PRAB SPMEX)$
```

The following table describes field names, subfield names, and valid data ranges for Table MNNODE.

Table 2-7 Field descriptions for Table MNNODE

Field	Subfield or refinement	Entry	Explanation and action
NODEKEY		See subfields	Node Key. Subfields are NODETYPE and NODEID.
	NODETYPE	SPM	Node Type. Enter SPM.
	NODEID	0 to 63	Node Identifier. Enter the SPM node identifier. The default value is 0.
ALIAS		1 to 12 alphanumeric characters	Alias. Enter an alias for the node.
CLASS		DMSCP	Class. DMSCP (DMS call processing). Assign SPMs deployed as DMS call processing peripherals to this class. For all software releases before SP12, the ONP automatically converts SPMs to this class.

Conditional datafill when CLASS=DMSCP
The following table lists conditional datafill when you enter DMSCP in field CLASS.

Table 2-8 Field descriptions when CLASS=DMSCP (Sheet 1 of 5)

Field	Subfield or refinement	Entry	Explanation and action
FLOOR		0 to 99	FLOOR. Enter the floor where the node is located.
CLKMODE		SYNC	CLOCK MODE. Enter SYNC.

Table 2-8 Field descriptions when CLASS=DMSCP (Sheet 2 of 5)

Field	Subfield or refinement	Entry	Explanation and action
CLKREF		INTERNAL or LOOP	Clock Reference. Enter a clock synchronization reference from the following list: • INTERNAL (The clock synchronizes to the DMS message switch. This is the default value.) • LOOP (The clock synchronizes to the local OC3 network.) ***Note:*** At initial program loading (IPL), field CLKREF is datafilled with the default value INTERNAL. When an SPM is datafilled in Table SYNCLK as a sync source, table control prevents a change from INTERNAL to LOOP. An attempt to make such a change from INTERNAL to LOOP results in the following message: "SPM is datafilled in Table SYNCLK as a SYNC SOURCE." When SPM OC3 line timing is not employed and an SPM node is connected to an OC3 SONET network, enter LOOP into field CLKREF to ensure correct OC3 network timing.
LEDTIMER		0 to 1440	Led Time-Out Period. Enter the LED timeout period in minutes. When the SPM detects no critical faults during the timeout period, the alarm LEDs turn off in order to extend their life. Enter 0 (zero) when the LEDs are to stay on at all times. The default value is 15.
RSRUTLIM		See subfields	Resource Utilization. This field consists of a vector of up to five entries in subfields RESTYPE and THRESHLD. Each entry sets a low water mark use threshold, as a percent, for a resource type. When the use exceeds the threshold, alarms or logs generate. Enter $ to select default values.
	RESTYPE	COT, DTMF, ECAN, TONESYN, MF	Resource Type. Enter a resources type from the following list: • COT (continuity test) • DTMF (dual-tone multi-frequency) • ECAN (echo cancellation) • TONESYN (tone synthesizer) • MF (multi-frequency signaling)

Table 2-8 Field descriptions when CLASS=DMSCP (Sheet 3 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	THRESHLD	10 to 100	Utilization Threshold. Enter the low water threshold as a percent of total resource. The default values are 60% for COT, DTMF, ECAN, TONESYN, and MF.
ALRMCTRL		See subfields	Alarm Control Information. This field consists of a vector of up to ten entries in subfields ALARM and ATTR. Each entry controls a particular alarm. Enter $ to select the system default values.
	ALARM	SYSB, MANB, ISTB, SYSBNA, MANBNA, COTLOW, DTMFLOW, ECANLOW, TONSLOW, MFLOW	Alarm Name. Enter an alarm name from the following list: • SYSB (system busy). This alarm generates when the node is in system busy state. The default alarm severity is CR. The default action is RPT. • MANB (manual busy). This alarm generates when the node is in manual busy state. The default alarm severity is MJ. The default action is RPT. • ISTB (in-service-trouble). This alarm generates when the node is in-service and it is experiencing non-service-affecting faults. The default alarm severity is MN. The default action is RPT. • SYSBNA (system busy and not accessible). This alarm generates when the node is in SYSB state and a network (for example, ENET or MS) error has caused it to be isolated. The default alarm severity is CR. The default action is RPT. • MANBNA (manual busy and not accessible). This alarm generates when the node is in MANB state, and a network (for example, ENET or MS) error has caused it to be isolated. The default alarm severity is MJ. The default action is RPT.

Table 2-8 Field descriptions when CLASS=DMSCP (Sheet 4 of 5)

Field	Subfield or refinement	Entry	Explanation and action
			• TONSLOW (low water mark threshold for TONESYN has been crossed). This alarm generates when use of the TONESYN resources exceeds the threshold previously set, meaning that TONESYN resource is in short supply. The default alarm severity is MN. The default action is RPT.
	ATTR	See subfields	Alarm Attributes. This field consists of subfields SEVERITY and ACTION.
	SEVERITY	NA, MN, MJ, CR	Severity. The severity of the alarm defines its relative importance. Enter a severity from the following list: • NA (no alarm) • MN (minor alarm) • MJ (major alarm) • CR (critical alarm)
	ACTION	NRPT, RPT	Action. This subfield indicates the action to be taken when a fault is detected. Enter an action from the following list: • NRPT (no report generated) • RPT (report generated)
EXECTAB		See subfields	Executables Table. This field is a vector of up to eight entries (one for each terminal type) in subfields EXEC and TRMTYPE. Each entry defines an executable lineup to be downloaded for a particular terminal type. If a node supports ISUP trunks only (no PTS trunks), enter $ in the subfields. If a node supports PTS, and/or PRI trunks, datafill subfields EXEC and TRMTYPE.

Table 2-8 Field descriptions when CLASS=DMSCP (Sheet 5 of 5)

Field	Subfield or refinement	Entry	Explanation and action
	TRMTYPE	ABTRK, PRAB	Terminal Type. Enter one of the following values for PTS trunks: • ABTRK (standard PTS trunk configuration) • PRAB (Primary Rate Access B channels)
	EXEC	SPMEX	EXEC LINEUP NAME. Enter the following values for SPM nodes supporting PTS trunks: • SPMEX (For DT, DP, PRI or MF signaling, all 12 trunk types use ABTRK with SPMEX.)

Table MNSHELF

An SPM consists of two shelves. Each tuple in Table MNSHELF (management network shelf) identifies a shelf on a particular node. The data maintained in this table includes the shelf identifier and physical shelf location.

The following shows sample datafill for Table MNSHELF.

Figure 2-12 Example of Table MNSHELF

```
 SHLFKEY   FRTYPE    FRNO      ROW   FRPOS     SHPOS      FRPEC      SHPEC
----------------------------------------------------------------------------
 SPM 0 0   SPME      3         A     13         6       NTLX91AA   NTLX51AA
 SPM 0 1   SPME      3         A     13        21       NTLX91AA   NTLX51AA
 SPM 1 0   SPME      2         B     12         6       NTLX91BA   NTLX51BA
 SPM 1 1   SPME      2         B     12        21       NTLX91BA   NTLX51BA
 SPM 2 0   SMGE      4         C     14         6       NTLX91BA   NTLX51BA
 SPM 2 1   SMGE      4         C     14        21       NTLX91BA   NTLX51BA
 SPM 3 0   SPME      5         D     15         6       NTLX91AA   NTLX51BA
 SPM 3 1   SPME      5         D     15        21       NTLX91AA   NTLX51BA
```

The following table describes field names, subfield names, and valid data ranges for Table MNSHELF.

Table 2-9 Example of Table MNSHELF (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
SHLFKEY		See subfields	Shelf Key. Subfields are NODETYPE, NODEID, and SHELFID.
	NODETYPE	SPM	Node Type. Enter SPM.
	NODEID	0 - 63	Node Identifier. Enter the SPM node identifier. The default is 0. *Note:* If the SPM identified in NODETYPE and NODEID has not been added to Table MNNODE, the message "Failed to find the specified SPM" displays.
	SHELFID	0 or 1	Shelf Identifier. Enter the shelf identifier. The lower shelf is shelf 0; the upper shelf is shelf 1. The default is 0.
FRTYPE		SPME, SMGE	Frame Type. Enter SPME or SMGE. • SMGE (Successive Media Gateway Equipment) frametype required for SMG4KD (Succession Media Gateway 4000 Distributed Access) class SPM indicated as the intended functionality of the SPM's datafill. • SPME (SPM equipment) frametype required for DMSCP (DMS call processing) and IW (interworking) class. SPM indicated as the intended functionality of the SPM's datafill.
FRNO		0-511	Frame Number. Enter the frame number.
ROW		A-H, J-N, P-Z, AA-HH, JJ-NN, PP-ZZ	Row. Enter the row where the frame is located.
FRPOS		0 - 99	Frame Position. Enter the frame position.

Table 2-9 Example of Table MNSHELF (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
SHPOS		0 - 77	Shelf Position. Enter the shelf position in inches. The recommended positions are 6, 21, 43, and 59. *Note:* In each SPM frame, there are a maximum of two SPMs—upper and lower SPM. Each SPM has a maximum of two shelves—bottom and upper shelf. The frame mounting positions of each shelf are "6" for lower SPM bottom shelf; "21" for lower SPM upper shelf; "43" for upper SPM lower shelf, and "59" for upper SPM upper shelf. The shelf position is specified in terms of the count of shelf mounting holes from the bottom of the frame.
FRPEC		NTLX91AA, NTLX50AA, NTLX91BA	Frame PEC. Enter the frame product engineering code (PEC). • NTLX91AA Frame PEC required when installing a new DMSCP class SPM. • NTLX50AA is no longer used for new SPM deployment. It is still valid for SPMs deployed before this software release. • NTLX91BA Frame PEC is required when you install a new IW and SMG4KDA class SPM.
SHPEC		NTLX51AA, NTLX53AA, NTLX51BA	Shelf PEC. Enter the shelf PEC. Valid values are: • NTLX51AA (two high-speed slots, double-height shelf, the default). This is the shelf PEC required for DMSCP- class SPMs. • NTLX53AA (two high-speed slots, single-height shelf). This is no longer used. • NTLX51BA (four high-speed slots, double-height shelf). This is the shelf PEC required for IW- and SMG4KDA-class SPMs.

Table MNCKTPAK

In Table MNCKTPAK (management network circuit pack), each tuple identifies 1 of 15 circuit packs on a shelf. The data maintained in this table includes the circuit pack type, product engineering code (PEC), load name, and slot number.

The following shows sample datafill for Table MNCKTPAK.

Figure 2-13 Example of Table MNCKTPAK

```
CPKKEY                                                      CPKINFO
          PEC RELEASE              LOAD
--------------------------------------------------------------------

SPM 10 0 9 OC3 0 WORKING 1 (SYSB CR RPT) (MANB MJ RPT)
          (ISTB MN RPT) (PROTFAIL NA RPT) $
          TLX71AA          01     OC315AA

SPM 10 0 10 OC3 1 SPARE 1 (SYSB CR RPT) (MANB MJ RPT) (ISTB MN RPT)
          (PROTFAIL NA RPT) $
           NTLX71AA          01     OC315AA

SPM 10 0  7 CEM 0 (SYSB CR RPT) (MANB MJ RPT) (ISTB MN RPT)
          (SYSBNA CR RPT)(MANBNA MJ RPT) (HLDOVR MJ RPT)
          (HLDOVR24 MJ RPT) (VCXO70 MN RPT) (VCXO90 MJ RPT)
          (CLKOOS MJ RPT) $
           NTLX63AA          01     CEM15AA

SPM 10 0  8 CEM 1 (SYSB CR RPT) (MANB MJ RPT) (ISTB MN RPT)
          (SYSBNA CR RPT) (MANBNA MJ RPT) (HLDOVR MJ RPT)
          (HLDOVR24 MJ RPT)(VCXO70 MN RPT) (VCXO90 MJ RPT)
          (CLKOOS MJ RPT) $
           NTLX63AA          01     CEM15AA

SPM 10 0  3 DSP 3 1 WORKING (DTMF 24) (TONESYN 128) $ (SYSB CR RPT)
          (MANB MJ RPT) (ISTB MN RPT) (PROTFAIL NA RPT) $
           NTLX65AA          01     DSP15AA

SPM 10 0  5 DLC 0 WORKING 1 (STSB CR RPT) (MANB MTRTP)
          (ISTB MN RPT) (PROTFAIL NA RPT) $
           NTLX72BA          01     DLC15AA

SPM 10 0  6 DLC 1 SPARE
           NTLX72BA          01     DLC15AA
```

The following table describes field names, subfield names, and valid data ranges for Table MNCKTPAK.

Table 2-10 Description of Table MNCKTPAK

Field	Subfield or refinement	Entry	Explanation and action
CPKKEY		See subfields	Circuit Pack Key. The subfields are NODETYPE, NODEID, SHELFID, and SLOTNUM.
	NODETYPE	SPM	Node Type. Enter SPM.
	NODEID	0-63	Node Identifier. Enter the SPM node identifier. The default is 0.
	SHELFID	0-1	Shelf Identifier. Enter the shelf identifier. The default is 0.
	SLOTNUM	1-14	Slot Number. Enter the slot number of the circuit pack. The default is 1. **Note:** Slots 7 and 8 on shelf 0 are used for CEM circuit packs. Slots 9 and 10 on shelf 0 are used for OC3 circuit packs.
CPKINFO		See subfields	Circuit Pack Information. This is a generic area that is refined for each circuit pack type.
	CPKTYPE	CEM, OC3, DSP, DLC	Circuit Pack Type. Enter the circuit pack type, then datafill the refinements.

CPKTYPE = CEM

When CPKTYPE equals CEM (common equipment module), the datafill is shown in the following table.

Table 2-11 Description of Table MNCKTPAK CPKTYPE = CEM

Field	Subfield or refinement	Entry	Explanation and action
CPKTYPE		CEM	Common Equipment Module. The subfields are UNITNO and ALARMCTRL.
	UNITNO	0-1	Unit Number. Enter the CEM unit number. There are a maximum of two CEMs per SPM. Unit number 0 is assigned to the CEM residing on shelf 0 slot 7. Unit number 1 is assigned to the CEM residing on shelf 0 slot 8.

Table 2-11 Description of Table MNCKTPAK CPKTYPE = CEM

Field	Subfield or refinement	Entry	Explanation and action
	ALRMCTRL	See subfields	Alarm Control. $ Default.
PEC		NTLX63AA, NTLX82AA	Product Engineering Code. This field indicates the product engineering code (PEC) of the circuit pack. Select an entry as follows:
			• NTLX63AA for CEM circuit pack
			• NTLX82AA for enhanced-CEM circuit packs
			• NTLX82BA for enhanced-CEM circuit packs
RELEASE		01-99 or 01-ZZ	Release. The default is 01.
LOAD		Up to 8 alphanumeric characters	Default load in PMLOADS.

CPKTYPE = OC3

If CPKTYPE equals OC3 (Optical Carrier 3), the datafill is shown in the following table.

Table 2-12 Description of Table MNCKTPAK CPKTYPE =OC3 (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CPKTYPE		OC3	Optical Carrier 3. The subfields are UNITNO, OC3GRPID, WKRSPR, and ALARMCTRL.
	UNITNO	0-1	Unit Number. Enter the OC3 unit number. There is a maximum of two OC3s per SPM. Assign unit number 0 to the OC3 residing on shelf 0, slot 9. Assign unit number 1 to the OC3 residing on shelf 0, slot 10.
	OC3GRPID	1-28	OC3 Group Identifier. Default is 1.

Table 2-12 Description of Table MNCKTPAK CPKTYPE =OC3 (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	WRKSPR	WORKING, SPARE	Working, Spare. Enter the OC3 protection role designation as follows: • WORKING indicates the circuit pack is designated to provide service. Slot 9. • SPARE indicates the circuit pack is designated to standby and take over the service if the WORKING circuit pack fails. Slot 10.
	ALRMCTRL	See subfields	Alarm Control Information. $ Default.
PEC		NTLX71AA, NTLX71BA	Product Engineering Code (PEC) of the circuit pack: • NTLX71AA for OC3 circuit pack • NTLX71BA for OC3 circuit pack
RELEASE		01-99 or 01-ZZ	Release. The default is 01.
LOAD		Up to 8 alphanumeric characters	Default software load for the circuit pack.

CPKTYPE = DSP

If CPKTYPE equals DSP (digital signal processor), the datafill is shown in the following table.

Table 2-13 Description of Table MNCKTPAK CPKTYPE = DSP (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CPKTYPE		DSP	Digital Signal Processor. The subfields are UNITNO, DSPGRPID, and RSRINFO.
	UNITNO	0-27	Unit Number. Enter the DSP unit number. The default is 0.
	DSPGRPID	1-28	DSP Group Identifier in Table MNPRTGRP The default is 1.
	RSRINFO	See subfields	Resource Info. .

Table 2-13 Description of Table MNCKTPAK CPKTYPE = DSP (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	WRKSPR	SPARE or WORKING	DSP RESOURCE CONFIGURATION. One DSP will be working. All others will be SPARE. Resources are defined only on the working DSP.
	RSRTYPE	COT, DTMF, TONESYN, STA, ABBIT, MF	Resource Type. This field specifies the SPM service resources that require threshold control. Valid resources are • COT • DTMF • TONESYN • STA • ABBIT • MF
	NUM	0 - 736 (0 - 28 for ABBIT)	Number of Resource. Enter the total number of resources datafilled on the DSP circuit pack. *Note:* If field RSRTYPE is datafilled with ABBIT, the range for field NUM is 0 to 28.
	ALRMCTRL	See subfields	Alarm Control Information. To accept the system defaults, enter $.
PEC		NTLX65AA, NTLX65BA	Product Engineering Code (PEC) of the circuit pack. • NTLX65AA for DSP circuit pack. • NTLX65BA for DSP circuit packs.
RELEASE		01-99 or 01-ZZ	Release. This field indicates the 01 release of the circuit pack. The default is 01.
LOAD		Up to 8 alphanumeric characters	This field indicates the default software load for the circuit pack in Table PMLOADS.

CPKTYPE = DLC

If CPKTYPE equals DLC (data link controller), the datafill is shown in the following table.

Field	Subfield or refinement	Entry	Explanation and action
CPKTYPE		DLC	Data Link Controller. The subfields are UNITNO, DLCGRPID, WKRSPR, and ALARMCTRL.
	UNITNO	0-27	Unit Number. Enter the DLC unit number. The default is 0.
	DLCGRPID	1-28	DLC Group Identifier. Enter the DLC protection group identifier in Table MNPRTGRP.
	WRKSPR	WORKING, SPARE	WORKING, SPARE. Enter the protection role designation as follows: • WORKING indicates the circuit pack is designated to provide service. • SPARE indicates the circuit pack is designated to standby and take over the service if the WORKING circuit pack fails. *Note:* There is a maximum of two DLCs for each SPM. Datafill one DLC as WORKING and datafill the other one as SPARE.
	ALRMCTRL	See subfields	Alarm Control Information. To accept the default values, enter $.
PEC		NTLX72AA	Product Engineering Code (PEC) of the circuit pack. • NTLX72AA for DLC circuit pack. • NTLX72BA for DLC circuit pack.
RELEASE		01-99 or 01-ZZ	Release. The default is 01.
LOAD		Up to 8 alphanumeric characters	This field indicates the default software load for the circuit pack in Table PMLOADS.

Table MNLINK

The data maintained in Table MNLINK (management network link) includes the link identifier and end-points of the link. Each tuple in the table identifies the C-side host link set for an SPM. The term *host link* refers to the DS-512

fiber link between the common equipment module (CEM) and the enhanced network (ENET) card.

Datafill new link information in Table MNLINK before putting new ENET cards or SPM modules on line. Before making changes to Table MNLINK, set the ENET cards which are connected to the SPM node specified in field NODEID to the offline (OFFL) state.

Datafill example

Each CEM module has four fiber-optic cable pairs. Each pair must be entered as a vector in field CSLNKSET. The following is an example of a link split over two shelves.

CEM 0		ENET PLANE 0		
CEM unit	CEM link ID	ENET shelf	ENET slot	ENET link
0	1	0	14	0
0	2	0	14	1
0	3	1	15	2
0	4	1	15	3
CEM 1		ENET PLANE 1		
CEM unit	CEM link ID	ENET shelf	ENET slot	ENET link
1	1	0	14	0
1	2	0	14	1
1	3	1	15	2
1	4	1	15	3

The following table showa an example of the connection of SPM host links to the ENET plane.

Shelf ID	Slot	CEM unit	Host link ID	ENET plane
0	7	0	1	0
0	7	0	2	0
0	7	0	3	0

Shelf ID	Slot	CEM unit	Host link ID	ENET plane
0	7	0	4	0
0	8	1	1	1
0	8	1	2	1
0	8	1	3	1
0	8	1	4	1

The following figure shows sample datafill for Table MNLINK.

Figure 2-14 Example of datafill in Table MNLINK

```
    LKSETKEY                                      CSLNKSET
---------------------------------------------------------------
  SPM  0 (1 0 14   0) (2 0 14   1) (3 1 15 2) (4 1 15 3)$
```

The following table describes field names, subfield names, and valid data ranges for Table MNLINK.

Field	Subfield or refinement	Entry	Explanation and action
LKSETKEY		See subfields	Linkset Key. This field consists of subfields NODETYPE and NODEID. This is the key field to Table MNLINK.
	NODETYPE	SPM	Node Type. Enter SPM.
	NODEID	0-63	Node Identifier. Enter the SPM node identifier. The default value is 0 (zero).

Field	Subfield or refinement	Entry	Explanation and action
CSLNKSET		See subfields	C-side Host Link Set. This is a vector consisting of 4 entries. Each entry defines a paired connection between one of the two SPM CEMs and the ENET. The subfields are LKPAIRID, ENSHELF, ENSLOT, and ENLINK. *Note:* There are four optical-fiber cables for each CEM. Enter four entries for each CSLINKSET vector. See the following table.
	LKPAIRID	1-4	Link Pair Identity. Enter the identity of the host link pair at the SPM end. The default value is 1.
	ENSHELF	0-3	ENET Shelf. Enter the ENET shelf where the link pair terminates. The default value is 0.
	ENSLOT	9-32	ENET Slot. Enter the ENET crosspoint (XPT) card slot where the link terminates. The default value is 32.
	ENLINK	0-18	ENET Link. Enter the ENET port (link) on the XPT card where the link terminates. The default value is 0.

Table MNHSCARR

Table MNHSCARR configures the P-side of the OC3 circuit pack. This is a syncronous optical network (SONET) OC3 (optical carrier with 3 STS1s) interface. SONET is a layered frame structure with overhead at each layer. PRI uses a DS1 facility. In SONET, the DS1 is represented by a DS1P tuple. This DS1P has either a VT15P or a DS3P parent carrier, depending on if this will terminate as a copper T1 or a COAX T3 facility. In either case, 28 of these DS1Ps and VT15P/DS3P encompass an STS1. The STS1 has overhead and is the switchable entity in the SONET transport network. Since we have an OC3, we have 3 STS1Ps. In addition, there are two carriers, OC3S and STS3L, for each card that control link maintenance and overhead for the physical fiber link. The sample datafill shows hierarchial structure. Note that all 84 DS1P tuples are not listed, nor are 56 other VT15P tuples. Also, the datafill

description assumes defaults for alarm control and parameters. See the full data schema document to investigate these further.

The following figure shows a small sample of datafill for Table MNHSCARR.

Figure 2-15 Example of datafill in Table MNHSCARR

```
                              CARRKEY CCNTO
                                                              CARRINFO
-----------------------------------------------------------------------------
SPM_0_OC3S_1_WORKING                        177
  OC3S SPM 0 0 9 (LBC 150 125 CR) (OPT 85 95 CR) (OPR 85 95 CR) $
  (SEFS 17 7 MN) (CV 4430 1772 MN) (ES 864 346 MN)
  (SES 4 2 MN) $ (LOS CR RPT) (LOF CR RPT) $

SPM_0_OC3S_1_SPARE                          178
  OC3S SPM 0 0 10 (LBC 150 125 CR) (OPT 85 95 CR) (OPR 85 95 CR) $
  (SEFS 17 7 MN) (CV 4430 1772 MN) (ES 864 346 MN)
  (SES 4 2 MN) $ (LOS CR RPT) (LOF CR RPT) $

SPM_0_STS3L_1_WORKING                       175
  STS3L SPM_0_OC3S_1_WORKING 4 7 HSCARR 1 (SFBERX MN RPT) (SDBERX MN RPT) $
  (CV 4430 1772 MN) (ES 864 346 MN) (SES 4 2 MN) (UAS 10 10 MN) $
  (AIS MN NRPT) (RFI MN NRPT) $

SPM_0_STS3L_2_SPARE                         176
  STS3L SPM_0_OC3S_1_SPARE 4 7 HSCARR 1 (SFBERX MN RPT) (SDBERX MN RPT) $
  (CV 4430 1772 MN) (ES 864 346 MN) (SES 4 2 MN) (UAS 10 10 MN) $
  (AIS MN NRPT) (RFI MN NRPT) $

SPM_0_STS1_1                                172
  STS1P SPM_0_STS3L_1_WORKING 1 VT SPM_0_STS1_1_PATH
  (CV 125 15 MN) (ES 100 12 MN) (SES 7 3 MN) (UAS 10 10 MN)
  (CVFE 125 15 MN) (ESFE 100 12 MN) (SESFE 7 3 MN)
  (UASFE 10 10 MN) $ (LOP MN NRPT) (AIS MN NRPT) (RFI MN NRPT)
  (PLM MN RPT) $

SPM_0_STS1_2                                173
  STS1P SPM_0_STS3L_1_WORKING 2 ASYNC_DS3 SPM_0_STS1_2_PATH
  (CV 125 15 MN) (ES 100 12 MN) (SES 7 3 MN) (UAS 10 10 MN)
  (CVFE 125 15 MN) (ESFE 100 12 MN) (SESFE 7 3 MN)
  (UASFE 10 10 MN) $ (LOP MN NRPT) (AIS MN NRPT) (RFI MN NRPT)
  (PLM MN RPT) $

SPM_0_STS1_3                                174
  STS1P SPM_0_STS3L_1_WORKING 3 UNEQ SPM_0_STS1_3_PATH
  (CV 125 15 MN) (ES 100 12 MN) (SES 7 3 MN) (UAS 10 10 MN)
  (CVFE 125 15 MN) (ESFE 100 12 MN) (SESFE 7 3 MN)
  (UASFE 10 10 MN) $ (LOP MN NRPT) (AIS MN NRPT) (RFI MN NRPT)
  (PLM MN RPT) $

SPM_0_STS1_2_DS3                            170
  DS3P SPM_0_STS1_2 M23 (CV 3820 382 MN) (ES 250 25 MN)
  (SES 40 4 MN) (UAS 10 10 MN) $ (AIS MN NRPT) (LOF MJ RPT)
  (RAI MN NRPT) $

SPM_4_STS1_1_ASYNC_1                        1
  DS1P SPM_4_STS1_1_VT_1_1  OFF  VT15P  ESF  (CV 132960 13296 MN)
  (ES 648 65 MN) (SES 100 10 MN) (CSS 4 1 MN) (UAS 10 10 MN) $ (AIS MN NRPT)
   (LOF MN RPT) (RAI MN NRPT)  $

SPM_4_STS1_1_VT_1_1                         85
  VT15P SPM_4_STS1_1 1 1 ASYNC_DS1 (CV 132960 13296 MN)
   (ES 648 65 MN) (SES 100 10 MN) (UAS 10 10 MN) $ (LOP MN RPT) (AIS MN NRPT)
    (RFI MN NRPT) ( PLM MN RPT) $

SPM_0_STS1_2_ASYNC_1                        29
  DS1P SPM_0_DS3P_2 OFF DS3P 1 ESF (CV 132960 13296 MN)
  ES 648 65 MN) (SES 100 10 MN) (CSS 4 1 MN) (UAS 10 10 MN) $ (AIS MN NRPT)
  LOF MN RPT) (RAI) MN NRPT) $
```

The following table describes field names, subfield names, and valid data ranges for Table MNHSCARR.

Table 2-14 Field descriptions for Table MNHSCARR (Sheet 1 of 6)

Field	Subfield or refinement	Entry	Explanation and action
CARRKEY		See subfield	Carrier Key. This field consists of subfield CARRNAME.
	CARRNAME	Up to 38 alphanumeric characters	Carrier Name. Enter the name assigned to the carrier.
CCTNO		1-180	Circuit Number. The curcuit number is arbitrary. An SPM can use between 1-180. For troubleshooting purposes, numbers 1-84 should be reserved for the DS1P tuples. This will ensure your logical carrier number matches your physical port assignment in Table MNPRIIID and also matches the physical carrier number. Recommendations are as follows: • OC3S 177-178 • STS3L 175-176 • STS1P 172-174 • DS3P 169-171. • VT1SP 85-168 • DS1P 1-84
CARRINFO		See subfield	Carrier Information. This field consists of subfield CARRTYPE and its refinements.

Table 2-14 Field descriptions for Table MNHSCARR (Sheet 2 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	CARRTYPE	OC3S, STS3L, STS1P, DS3P, VT15P, DS1P	Carrier Type. Enter the carrier type and datafill the refinements according to the following list:
			• OC3 section termination datafill.
			• STS3 line termination datafill.
			• STS3 concatenated path termination datafill.
			• STS1 path termination datafill.
			• DS3 path termination datafill.
			• V 1.5 path termination datafill.
			• DS1 path termination datafill.
			• DSIL path carrier datafill.
CARRTYPE= OC3S	PHYLINK	See refinements	Physical Link. This is the location of the OC-3 circuit pack on the optical fiber/link termination. This field consists of refinements NODETYPE, NODEID, SHELFID, and SLOTNUM.
	NODETYPE	SPM	Node Type. Enter the type of node, which is SPM.
	NODEID	0-63	Node Identifier.
	SHELFID	0 or 1	Shelf Identifier for the shelf that contains the circuit pack.
	SLOTNUM	1-14	Slot Identifier of the circuit pack. Slots 7-8 are reserved for the CEM card, slots 9-10 for the OC3 cards.
	OC3PP	See refinements	OC3 Carrier Physical Medium LayerParameter Attributes. $ Default.
	OC3PM	See refinements	Performance Measurements. $ Default.
	OC3FAIL	See refinements	Defect or Failure Attributes for OC3 Section Carrier. $ Default.
CARRTYPE= STS3L	PCRRNAME	Up to 38 alphanumeric characters	Parent Carrier Name. Enter the OC3S parent carrier name.

Table 2-14 Field descriptions for Table MNHSCARR (Sheet 3 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	SFBERLIM	3-5	Signal Failure Bit-Error-Ratio Threshold. Signal failure is declared when the threshold is crossed. Interpret the field as 1 x 10E-SFBERLIM. For example, the value 3 corresponds to 1 x 10E-3 and the value 5 corresponds to 1 x 10E-5. The default value is 4.
	SDBERLIM	5-9	Signal Degradation Bit-Error-Ratio Threshold. Signal degradation is declared when the threshold is crossed. Interpret the field as 1 x 10E-SDBERLIM. For example, the value 5 corresponds to 1 x 10E-5 and the value 9 corresponds to 1 x 10E-9. The default value is 7.
	CARRCLAS	HSCARR	Carrier Class. Enter HSCARR (high-speed carrier).
	STS3GRID	1-28	STS3 Group Identification of the STS3 line protection group in Table MNPRTGRP. The default value is 1.
	GENFLT	See refinements	General Fault Attributes. $ Default.
	STS3PM	See refinements	STS3 Performance Measurement. $ Default.
	STS3FAIL	See refinements	Failure Attributes. $ Default.
	STS1FAIL	See refinements	Failure Attributes. $ Default.
CARRTYPE= STS1P	PCRRNAME	Up to 38 alphanumeric characters	Parent Carrier Name ***Note:*** An STS1 is hosted by an STS3L carrier, which is resident on a working OC3 circuit pack.
	STS1POS	1-3	STS1 Payload Position. This field indicates the position of the STS1 in the payload. The default value is 1.

Table 2-14 Field descriptions for Table MNHSCARR (Sheet 4 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	STS1PALD	UNEQ, VT, ASYNC_DS3	STS1 Payload Type. This field indicates the type of payload the STS1 is carrying. The default is VT. Valid values are as follows: • UNEQ (payload is unequipped). • VT (VT-structured payload, the default value). • ASYNC_DS3 (asynchronous DS3).
	STS1PTRC	Up to 62 alphanumeric characters	STS1 Path Trace Message.
	STS1PM	See refinements	STS1 Performance Measure Attributes.
	STS1FAIL	See refinements	STS1 Failure Attributes.
CARRTYPE= DS3P	PCRRNAME	Up to 38 alphanumeric characters	Parent Carrier Name. Enter the STS1P parent carrier name. **Note:** A DS3P carrier can only host off a STS1P carrier with asynchronous DS3 (ASYNC_DS3) payload.
	DS3APP	See refinements	Application Carried by the DS3 Path. Its subfield is APPTYPE.
	APPTYPE	M23	Application Type. The only valid value is M23, which is the M23 application. Refine the M23 application.
	M23DS3PM	See refinements	Performance Measurements for DS3 Path Carrier. $ Default.
	DS3FAIL	See refinements	DS3 Failure Attributes. $ Default.
CARRTYPE= VT15P	PCARRNAME	Up to 38 alphanumeric characters	Parent Carrier Name. Enter the parent carrier name.
	VTGRPID	1-7	VT Group Identification. Enter the group identification. The default is 1.
	VTID	1-4	VT1.5 Identification. Enter the VT1.5 identification within the VT group. The default is 1.

Table 2-14 Field descriptions for Table MNHSCARR (Sheet 5 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	VT15PALD	ASYNC_DS1, BYSYNC_DS1	VT1.5 Payload Type. Enter the STS1 payload type as follows: • ASYNC_DS1 (asynchronous DS1 payload) • BYSYNC_DS1 (byte-synchronous DS-1 payload, the default value)
	VT15PM	See refinements	VT1.5 Performance Measure Attributes. $ Default.
	VT15FAIL	See refinements	VT1.5 Failure Attributes. $ Default.
CARRTYPE = DS1P	PCRRNAME	1 to 38 alphanumeric characters	Parent Carrier Name. Enter the VT15P or DS3P parent carrier name.
	DS1ZCS	OFF/ON	Zero Code Suppression (ZCS). This field indicates if the zero code suppression is enabled or disabled for DS1p carrier. Its values depend on the Frame format option. • For Frame format SF, the values are: ON - Zero code suppression is enabled. OFF - Zero code suppression is disabled. • For Frame format ESF, only the OFF value is supported ***Note:*** If the DS1 carries channelized data services that require 64k clear-channel transmission, use the OFF value. This avoids undesirable ZCS modification of the bitstream. .
	DS1POS	See refinements	DS1 Position. This field indicates the position of the DS1P carrier in the payload. Its one subfield is PCARRTYP.

Table 2-14 Field descriptions for Table MNHSCARR (Sheet 6 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	PCARRTYP	DS3P or VT15P	Parent Carrier Type. Valid values are • DS3P (DS3 path carrier). Refine DS3P by entering PALDPOS, which is the DS1P carrier in the DS3 payload. Valid values are 1-28. • VT15P (VT1.5 path carrier with asynchronous DS1 payload)
	PALDPOS	1-28	Payload Position. Enter the position of the DS1P carrier in the DS3 payload.
	FRAMEFMT	ESF or SF	Frame Format. This field indicates the frame format used by the DS1P carrier. Valid values are • ESF (extended superframe) • SF (superframe) Enter refinements for ESF and SF as described here.
	ESFDS1PM	See refinements	Extended Superframe DS1 Performance Measurement. $ Default.

Table MNPRIIID

Table MNPRIIID provisions the PRI interface ID for each DS1 carrier in Table MNHSCARR. This table is used only for SPM. This value is used in the Q931 channel information element for NFAS PRI groups discussed in the beginning of this section.

The following table lists datafill for Table MNPRIIID.

Table 2-15 Field descriptions for Table MNPRIIID

Field	Subfield or refinement	Entry	Explanation and action
NODETYPE		SPM	Peripheral type is always SPM.
NODEID		0-63	The SPM number.
CCTNO		1-84	DS1 Circuit Number.
INTID		0-127	PRI interface ID. Defaut 0.

The following example shows sample datafill for Table MNPRIIID. Span 1
(SPM 0 1) is a 23B+D associated signaling PRI. Spans 2 & 3 (SPM 0 2, 3) are
a 46B+D+BD NFAS PRI group.

Figure 2-16 MAP display example for Table MNPRIIID

```
Nodetype NODENO  CCTNO  INTID
---------------------------
SPM        0       1      0
SPM        0       2      0
SPM        0       3      1
```

Capacity

Consider the data in the table below when provisioning PMs to avoid
overloading. Limit trunk groups using non-facility associated signaling to ten
T1 spans for each D-channel. If call durations are longer, add more spans. If
call durations are short and rapid, decrease the number of spans.

Table 2-16 XPM capacity

Peripheral module DTCI (with M1 PBX)	Maximum capacity
SPM capacity	80,000 calls per hour
XPM PLUS UP (XMS-based extended peripheral module product life upgrade strategy unified processor)	35,000 calls per hour

Physical connections

Use the channel service unit (CSU) as a demarcation point only. The service
provider is typically responsible up to and including the CSU, leaving the
subscriber responsible beyond that point. Depending on the CSU type and
manufacturer, conversion capabilities of different extended frame formats
(ESF), superframes (SF), D4, monitor connections, and loop-backs can exist.

Use 24 AWG wire with transmit pairs and receive pairs in separate shields,
usually in separate sheaths. Connect drain wires on one end only. The actual
connection can be wire-wrap, DB-15, RJ-48, or Bantam jacks. The RJ-48

connectors are becoming more popular. PRI pin-outs are shown in the table below.

Table 2-17 PRI pin-outs

Signal	Pin RJ-48	Pin DB-15	Network	CPE
R1	1	11	Rx Net->CSU	Tx CSU->DTE
T1	2	3	Rx Net->CSU	Tx CSU->DTE
R	4	9	Tx CSU->NET	Rx DTE->CSU
T	5	1	Tx CSU->NET	Rx DTE->CSU

Part III
Provisioning

Part III: "Provisioning" contains the chapter, "PRI Trunk Datafill."

3 PRI Trunk Datafill

PRI Base Service ordering codes

Functional group ordering codes: NI000011, NI000012, NI000022

Functionality ordering codes: not applicable

Release applicability

BCS36 and up.

Translations table flow

The PRI Base Service translation process is shown in the following flowchart. Most of the Base Service tables are information tables and do not affect the PRI translation process.

Figure 3-1 Table flow for PRI Base Service
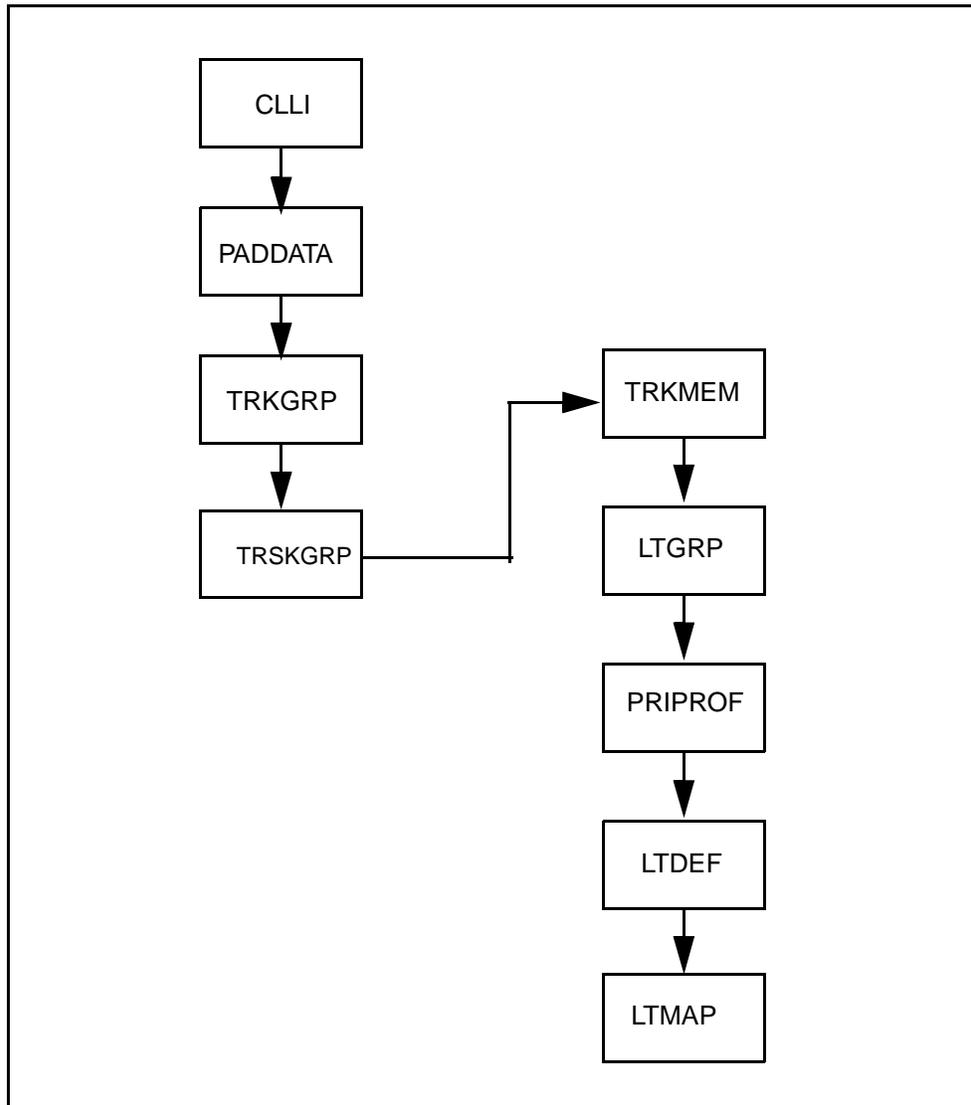
Datafilling Table CLLI

Table CLLI is datafilled to define trunk groups.

Table 3-1 Datafilling Table CLLI

Field	Entry	Description
CLLI	Alphanumeric (up to 16 characters)	Common Language Location Identifier.
ADNUM	Trunk group number (indexes the TRK OM)	Administration Trunk Group Number.
TRKGRSIZ	Number of trunk group members 0 to 499	Trunk Group Size.
ADMININF	User text 32 characters maximum	Administration Information.

Datafill example for Table CLLI

The following example shows sample datafill for Table CLLI. This example illustrates a 47B+D configuration.

Figure 3-2 MAP display example for Table LTDATA

```
CLLI      ADNUM      TRKGRSIZ                    ADMININF
_____

NAPBX 172            47      PRA_TRUNK_TO_SL1_PBX
```

Datafilling Table TRKGRP

Table TRKGRP defines the trunk group type as well as the B-channel selection sequence, the LTID of the trunk group, and the billing directory number (DN).

Table 3-2 Datafilling Table TRKGRP (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
GRPKEY		CLLI	Group Key. This field consists of subfield CLLI.
ADNUM	CLLI	Alphanumeric (up to 16 characters)	CLLI from Table CLLI.
GRPINFO		See subfields	Group Information.

Table 3-2 Datafilling Table TRKGRP (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	GRPTYP	PRA, IBNT2	Group Type. Define the trunk type by entering one of the following values: • PRA for primary rate interface. • IBNT2 for MDC PRI.
	TRAFSNO	Numeric (0-127)	Traffic Separation Number.
	PADGRP	Index to Table PADGRP	NPDGP for No Pad Group (no pad group necessary for PRI).
	NCCLS	NCRT, NCBN, NCID, NCIM, NCIT, NCLT, NCOF, NCON, NCOT, NCTC, or NOSC	Operational Measurement (OM) No Circuit Class. • NCRT for no circuit (OM register OFZNCRT) (default). • NCBN for no circuit business network (OM register OFZNCBN). • NCID for no circuit inward dial (OM register OFZNCID). • NCIM for no circuit intermachine (OM register OFZNCIM). • NCIT for no circuit intertoll (OM register OFZNMCIT). • NCLT for no circuit local tandem (OM register OFZNCLT). • NCOF for no circuit offnet trunk (OM register OFZNCOF). • NCON for no circuit onnet trunk (OM register OFZNCON). • NCOT for no circuit other trunk (OM register OFZNCOT). • NCTC for no circuit toll completing (OM register OFZNCTC). • NOSC for no service circuit (OM register OFZNOSC).

Table 3-2 Datafilling Table TRKGRP (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	SELSEQ	ASEQ, DSEQ, MIDL, LIDL, CWCTH, or CCWCTH	B-channel Selection Sequence. To change the field SELSEQ value after the trunk group has been datafilled, you must delete the trunk group and then add it again.
			• ASEQ - ascending sequence.
			• CCWCTH - counter-clockwise circular trunk hunting.
			• CWCTH - clockwise circular trunk hunting.
			• DSEQ - desending sequence.
			• LIDL - least idle.
			• MIDL - most idle.
	BILLDN	Numeric (up to 11 digits) or N	Billing Director Number.
			• Enter the DN (up to 11 digits) to which all calls are billed, regardless of the calling party number.
			• Enter N when the calling number is a billing DN.
	LTID	$	Logical Terminal Identifier. Enter a $ to satisfy the table editor. This will be filled automatically when Table LTMAP is datafilled.

Datafill example for Table TRKGRP

The following example shows sample datafill for Table TRKGRP.

Figure 3-3 MAP display example for Table TRKGRP

```
GRPKEY                                        GRPINFO
_____

NAPBX
                PRA 0 PRAC NCRT ASEQ N (ISDN 1008)$
```
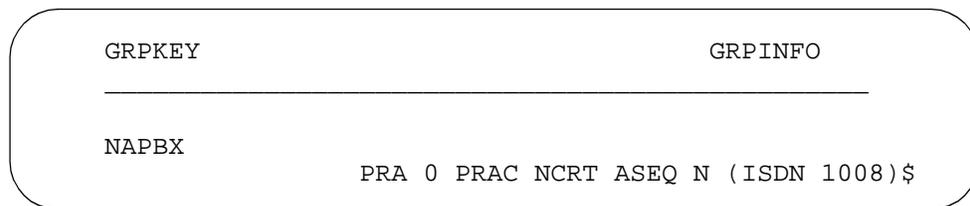
Datafilling Table TRKSGRP

Table TRKSGRP defines the D-channel for the trunk group.

Table 3-3 Datafilling Table TRKSGRP (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
SGRPKEY	FIXED_SIZE	CLLI, SGRP	Subgroup Key
	CLLI	Alphanumeric (1 to 16 characters)	Common Language Location Identifier.
CARDCODE		DS1SIG	Card Code.
SGRPVAR		See subfields	Subgroup Variable Refinements.
	SIGDATA	ISDN	Subgroup Variable.
	PSPDSEIZ	Numeric (2-30)	Permanent Signal or Partial Dial on Seizure Timing.
	PARTDIAL	Numeric (2-30)	Partial Dial Timing.
	VERSION	87Q931	Protocol Version.
	CRLENGTH	1 or 2	Call Reference Length.
	BCHNEG	N	B-channel Negotiation.
	BCHGLARE	STAND or YIELD	B-channel Glare.
			• STAND - the switch takes a B-Channel in contention.
			• YIELD - the swich gives up a B-Channel in contention.
			• Use STAND when IFCLASS is a NETWORK. Use YIELD when IFCLASS is a USER.
	IFCLALSS	NETWORK, USER	
	CONFIG	PPT_PT	Configuration. Enter PT_PT for Point-to-Point.
	LOCATION	LOCALEO, USER, or PVTNET	Location indicator for abnormal released calls.
			• LOCALEO for local end office (public network) (default).
			• USER for public network.
			• PVNET for private network.
	SAT	Y or N	Satellite. (Default is N).

Table 3-3 Datafilling Table TRKSGRP (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	ECSTAT	INTERNAL, INNOTONE, EXTERNAL, or UNEQ	Echo Canceller Status. • INTERNAL for internal processing and enabling by call processing. • INNOTONE for internal with inbound no tone. • EXTERNAL for external with no call processing involved. • UNEQ for unequipped (default).
	TRKGRDTM	Numeric (1 - 255)	Trunk Guard Timing.
	L1FLAGS	Y or N	*Layer 1 flags* L1FLAGS is only valid on TDM/XPMs. It indicates what may be expected as an idle code when no frames are transmitted on a D-channel, particularly when the NTBX01 (ISP card) is used in the XPM. The default value should be Y(es). Y(es) means that the idle code is 7E. Most non-Nortel equipment and Nortel M1 use this value. N(o) means that the idle code can be 7E + other value, such as 7F. This value can be used when connecting to other TDM/XPMs. See NIS-A211-1 (Standard release 08.01, August 1998), section 4.5 and NIS-A233-1 (Standard release 05.01, April, 1999), section 4.5 for more information about the idle codes.
	PARMNAME	Index to Table ISDNPARM	Default ISDNNM set to BLK if not subscribed.
	DCHNL	PMTYPE	D-channel.
	PMTYPE	DTCI, LTC, or SPM	Peripheral Module Type.
	DTCINO, LTCNO, or SPMNO	Numeric (0 - 511)	Peripheral Number.
	DTCICKTN, LTCCKTNO or SPMCKTNO	Numeric (0 - 24)	DS1 circuit number.

Table 3-3 Datafilling Table TRKSGRP (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	DTCICKTTS, LTCCKTTS, or SPMCKTTS	Numeric (1 - 24)	D-channel Time Slot Number.
	DCHRATE	64K	D-channel Rate. 64K default.
	HDLCTYPE	HDLC	High Level Data Link Type.

Datafill example for Table TRKSGRP

The following example shows sample datafill for Table TRKSGRP.

Figure 3-4 MAP display example for Table TRKSGRP

```
SGRPKEY      CARDCODE
                                                       SGRPVAR
_____

SL1NTPRI  0  DS1SIG
ISDN 2 2 87Q931 1 N STAND NETWORK PTT_PT USER N UNEQ
30 N ISDNNM DTCI 0 0 24 64K  HDLC
                         $
```

Datafilling Table TRKMEM

Table TRKMEM contains an entry for each B-channel in the trunk group, defining the PM number, circuit number, and time slot number.

The following table shows the ISDN PRI datafill for Table TRKMEM.

Table 3-4 Datafilling Table TRKMEM (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CLLI		Alphanumeric (1-16 characters)	Common Language Location Identifier.
EXTRKNM		Numeric (1-479)	External Trunk Number.
SGRP		0 (zero)	Subgroup.
MEMVAR		See subfields	Member Variables.
	PMTYPE	DTCI, LTC, or SPM	Peripheral Module Type.

Table 3-4 Datafilling Table TRKMEM (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	DTCINO, LTCNO, or SPMNO	Numeric (0-511)	Peripheral Number.
	DTCICKTNO LTCCKTNO, or SPMCKTNO	Numeric (0-24)	DS1 Circuit Number.
	DTCICKTTS, LTCCKTTS, or SPMCKTTS	Numeric (1-24)	B-channel Time Slot Number.

Datafill example for Table TRKMEM

The following example shows sample datafill for Table TRKMEM.

Figure 3-5 MAP display example for Table TRKMEM

```
CLLI    EXTRKNM  SGRP                          MEMVAR
_____

NAPBX 1    0                       DTCI   2 0 1
```

Datafilling Table LTGRP

The following table shows the PRI datafill for Table LTGRP. Only those fields that apply directly to PRI Base Service are shown.

Table 3-5 Datafilling Table LTGRP

Field	Subfield or refinement	Entry	Explanation and action
GROUP		ISDN	Group Name.
GROUPNO		Numeric (0 - 31)	Group Number.
OPTIONS		SAPI16	Options. Enter a $ to end the tuple.

Datafill example for Table LTGRP

The following example shows sample datafill for Table LTGRP.

Figure 3-6 MAP display example for Table LTGRP

```
GROUP    GROUPNO    OPTIONS
_____

ISDN        0            (SAPI16)$
```

Datafilling Table LTDEF

Table LTDEF identifies access privileges.

Table 3-6 Datafilling Table LTDEF (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LTKEY		LTGRP, LTNUM	Logical Terminal Key.
	LTGRP	ISDN	Logical Terminal Group.
	LTNUM	Numeric (1-1022)	Logical Terminal Number.
LTAP		B	Logical Terminal Access Privilege.
CLASSREF		See subfields	Class Reference.
	LTCLASS	PRA	Logical Terminal Class. Enter PRA.
	NUMBCHNL	Numeric (1-479)	Number of B-channels.
	VARIANT	N449PRI, NIPRI, NTNAPRI, U449PRI, or U459PRI	Protocol Variant. • Enter N449PRI when connecting to ATT SYS85 equipment • Enter NIPRI when connecting to National ISDN-2 PRI compliant equipment • Enter NTNAPRI when connecting switching nodes manufactured by Nortel. • Enter U449PRI when connecting to an AT&T 4ESS switch. • Enter U459PRI when connecting to an AT&T 5ESS switch.
	ISSUE	VI, NI2V1	Variant Issue. Enter NI2V1 for NIPRI variant only.

Table 3-6 Datafilling Table LTDEF (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	PROFNAME	Alphanumeric (1-8 characters)	Profile name. NIL SL1PROFL if connected to MI PBX.
	OPTION	NOPMD, NOVOICE, NOVBD, NOCMD, PGRPID, ONPLNC, SZGRDTM, or $	Option. Enter one of the following values: • NOPMD to prevent packet-mode calls. (This is the default). • NOVOICE to prevent calls with a speech BC from originating or terminating on the PRI interface. • MPVBD to prevent voice-band data calls. • NOCMD to prevent circuit-mode data calls. • PGRPID if the LTID is a member of a Serving PRI group as defined in table SVPRIGRP • ONPLNC to allow digits for non-AIN translations. See section "ONPLNC option" on page 5-6 for more information. • SZGRDTM to specify the minimum amount of time the DMS will wait after a call completion before seizing that same trunk for another call. The default value, without this option, is 750 ms. This option is valid for PRI IBNT2 and PRA250 Trunk Types (as datafilled in table TRKSGRP • $ to end the tuple.

Datafill example for Table LTDEF

The following example shows sample datafill for Table LTDEF.

Figure 3-7 MAP display example for Table LTDEF

```
    LTKEY      LTAP
                                                  CLASSREF
    _____

    ISDN 1008    B
    PRA 23 NTNAPRI  V1  NIL (NOPMD ) $
```

Datafilling Table LTMAP

Table LTMAP associates the LTID assigned to the trunk group in Table LTDEF with trunk group CLLI. Only those fields that apply directly to PRI Base Service are shown below.

Table 3-7 Datafilling Table LTMAP

Field	Subfield or refinement	Entry	Explanation and action
LTKEY		LTGRP, LTNUM	Logical Terminal Key.
	LTGRP	ISDN	Logical Terminal Group. Enter ISDN.
	LTNUM	Numeric (1-1022)	Logical Terminal Number. Enter a numeric value.
	MAPTYPE	CLLI	Trunk Group CLLI name.
	OPTION	TEI 0	Terminal Endpoint Identifier

Datafill example for Table LTMAP

The following example shows sample datafill for Table LTMAP.

Figure 3-8 MAP display example for Table LTMAP

```
LTKEY
_____

ISDN 1008    CLLI NAPBX (TEI 0)$
```

Datafilling Table LTCALLS

Table LTCALLS specifies routing for incoming calls. Routing is done seperately for each type of service subscribed.

Table 3-8 Description of Table LTCALLS (Sheet 1 of 3)

Field	Subfield	Entry	Description
LTID		See subfields	Logical Terminal Identifier. This field consists of subfields LTGRP, LTNUM, and CALLTYPE.
	LTGRP	Alphameric (up to 8 characters)	Logical Terminal Group. Enter the logical terminal group name from Table LTGRP.

Table 3-8 Description of Table LTCALLS (Sheet 2 of 3)

Field	Subfield	Entry	Description
	LTNUM	1–1022	Logical Terminal Number. Enter the logical terminal number within the group.
	Call type	FX, HM, INWATS, PUB, PVT, SCOCS, TIE, WATS,	Call type. Enter the call type associated with the LTID. • FX (foreign exchange). • HM (hotel/motel). This provides detailed billing information for hotels. • INWATS (Inward Wide Area Telecommunications Service). • PUB (public). • PVT (private). • SCOCS (Selective Class of Call Screening) SIDXLA option is manditory. This provides detailed billing information. • TIE (tie line). • WATS (Wide Area Telecommunications Service).
XLARTE	XLARTE	RTEREF, XLAIBN, XLALEC	Translations Route. • RTEREF when all calls go to a specific route. • XLAIBN for integrated business network (IBN) translations. • XLALEC for public local exchange carrier translations.
	LINEATTR	0–31,999	Line Attributes Index.
	CUSTGRP	Alphanumeric	Customer Group name.
	SUBGRP	0–7	Subgroup number.
	NCOS	0–511	Network Class of Service.

Table 3-8 Description of Table LTCALLS (Sheet 3 of 3)

Field	Subfield	Entry	Description
OPTIONS		EA, INCLID, LPIC, SIDXLA	Options. This field consists of subfield logical terminal option (LTCOPT).
			LTOPT - SIDXLA for SID routing. (see routing section)
			EA - Equal Access.
			INCLID - Calling Line ID.
			LPIC - Lata PIC.

Datafill example for Table LTCALLS.

The following example shows sample datafill for Table LTCALLS.

Figure 3-9 Example of Table LTCALLS


```
        LTID                        XLARTSEL
                                              OPTIONS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
ISDN  1008 PUB                    XLALEC   300
                                             (EA   MCI222 Y)$
ISDN  1008 INWATS  XLAIBN  300        ISDN2 0   0
                                            (INCLID SUPPRESS)$
ISDN  1008 WATS  XLAIBN  300          ISDN2 0   0$
ISDN  1008 FX   XLAIBN  300      PBXGROUP 0   0
                                        (SIDXLA    PRIFX Y Y N)$
ISDN  1008 TIE              RTEREF   IBNRTE  1007
                                                        $
```

Part IV
Call Routing

Part IV: "Call Routing" contains the chapter, "PRI Call Routing."

4 PRI Call Routing

This chapter describes the routing datafill required to provide ISDN PRI.

Datafilling routing tables

The tables in each category are discussed in the order in which they are datafilled. Only those fields that are specific to PRI are discussed. For a complete description of other fields, refer to Translations Guide, 297-8021-350.

The following figure shows the relationship of the PRI data tables.

Figure 4-1 PRI datafill table flow
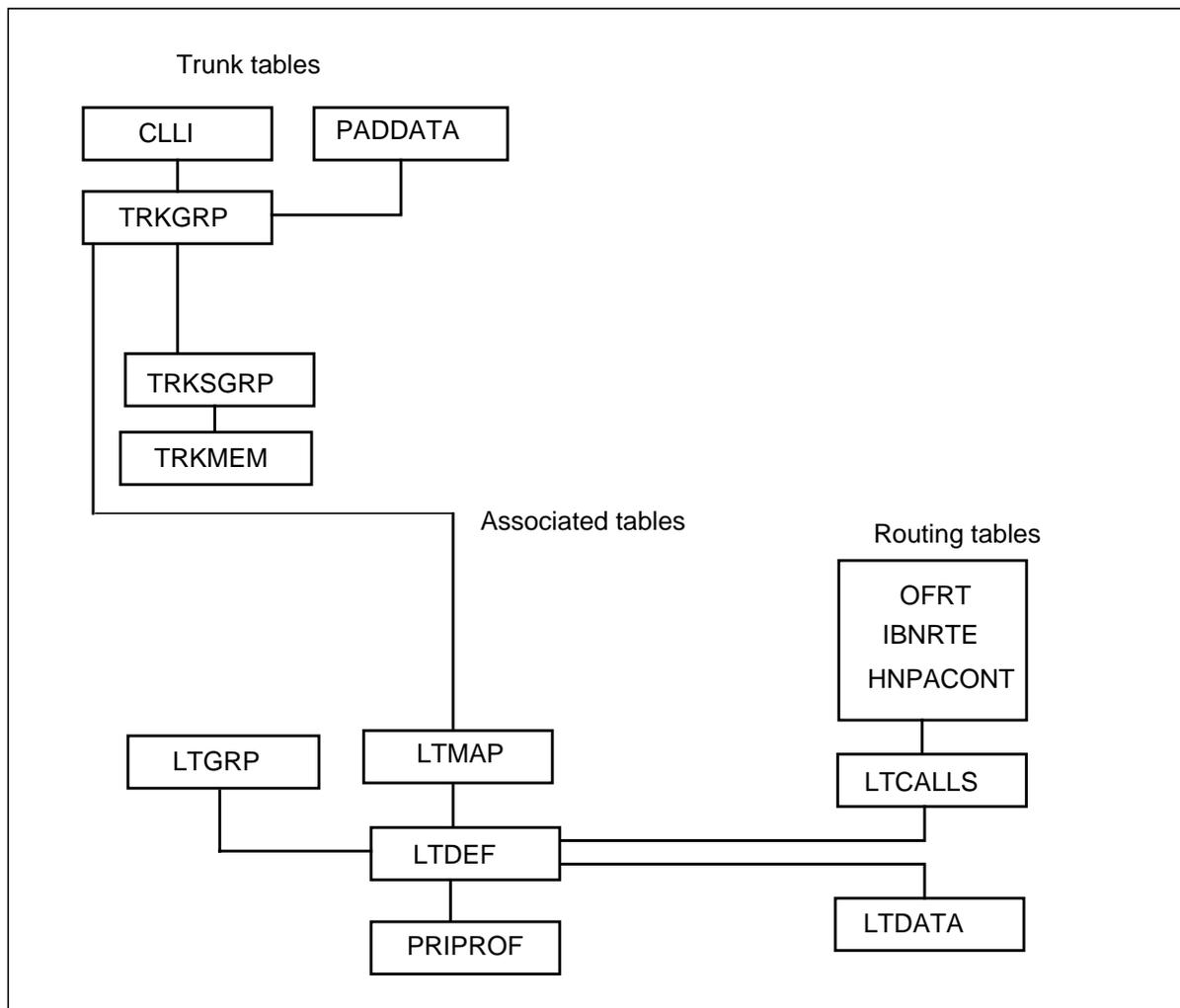
Call-by-call translations

All PRI trunk groups have similar datafill processes. The first step is to build the trunk group and then build standard routes. The application determines the features and the enhancements to routing. The illustrations in this document, use an M1 PBX as the application. The other applications use a subset of these translations.

Call routing translations

All incoming and outgoing ISDN PRI calls use the same basic translations. The call-by-cal, Integrated Services Access (ISA), feature uses an optional information element in the D-channel messaging to route each call based on call type (public, private, TIE, WATS). If the DMS switch does not use the call-by-call feature, all incoming and outgoing calls default to being public calls.

Table LTCALLS is the primary table for routing incoming calls. There is a tuple for each all-type or each trunk-group that determines the routing for that type of call. For outgoing calls, use the ISA selector to define the call type. Use the ISA selector in the following Tables: OFRT, HNPACONT-RTEREF, and IBNRTE.

Various TRAVER examples in this document demonstrate routing. The following figure shows an example of standard routing.
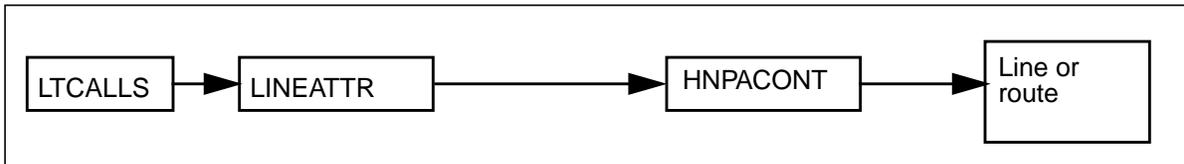
Figure 4-2 Standard routing

Table HNPACONT:RTEREF sets the outgoing route. Notice that Tables OFRT and IBNRTE datafill exactly as RTEREF and are in use for private routing. The following figure shows an example of Table HNPACONT:RTEREF.

Figure 4-3 Example of Table HNPACONT:RTEREF

```
  RTE
  RTELIST
---------------------------------------------------------
   902 (  ISA N N N PRI14    PUB NONE    N N 0)$
   905 (  ISA N N N PRI14     FX    0   E164 0)$
   906 (  ISA N N N PRI14     FX    0    PVT 0)$
   907 (  ISA N N N PRI14     TIE   0   E164 0)$
   908 (  ISA N N N PRI14     TIE   0    PVT 0)$
   909 (  ISA N N N PRI14 INWATS    0   E164 0)$
   910 (  ISA N N N PRI14 INWATS    0    PVT 0)$
  1005            (  VFG N N N    ERIC    33)$
```

The following table provides a description of the fields and settings in Table HNPACONT:RTEREF.

Table 4-1 Description of Table HNPACONT:RTEREF (Sheet 1 of 2)

Field	Description	Settings
RTE	IBN route reference Index	RTE - Enter the route reference number assigned to the route list.
RTELIST	IBN route selector	IBNRTSEL - VFG route selector. ISA for ISA route selector.
	Off-hook queuing	OHQ - N (Enter Y if off hook queuing is required.
	Callback queuing	CBQ - N (Enter Y if call back queuing is required.
	Expensive route	EXP - N (Enter Y if an expensive route warning tone is to be applied.)
	Virtual facility group	VFG - Name of the VFG in Table ISAXLA. This subfield is only applicable if the VFG route selector is entered.
	Common language location identifier	CLLI - Enter the CLLI of the PRI trunk group to which translation has to route. This subfield is only applicable if the ISA route selector is entered.
	Call type (CALLTYPE)	CALLTYPE - PUB for public network calls CALLTYPE - OW For OutWats CALLTYPE - INWATS for INWATS CALLTYPE - TIE for Tie Line trunks CALLTYPE - PVT for private network calls (Not valid on PRI trunks using NIPRI protocol) CALLTYPE - FX for foreign exchange calls

Table 4-1 Description of Table HNPACONT:RTEREF (Sheet 2 of 2)

Field	Description	Settings
	Transit network selection	TNS - (Enter N when no TNS is required. When the TNS is determined from the calls originator. Enter C.
	Number identification	NPOS - N (Enter N if calling number identification is required for ONI or ANI-failure calls from SC/TOPS trunks. Enter Y if no calling number identification is required.
	Operator access type	OATYPE - NONE (Enter the type of operator access that is required on this call. Options: None, OP and OM.
	WATS zone number	ZONE- OUTWATS Zone Number
	Facility Number	FACNUM - Enter the facility number to be included in the NSF information element. This is also called a SID.
	Numbering Plan Indicator	NPI - PVT for private numbering plan or E164 for the E.164 numbering plan.
	Digit Manipulation Index	DMI - Enter the index into Table DIGMAN used to convert the dialed digits to a new set of digits which are then retranslated to route the call to the desired destination.

Tables HNPACONT, HNPACODE, and RTEREF review the dialed digits, index the route, and then send the call to completion. The following figure shows an example of Table HNPACONT.

Figure 4-4 Example of Table HNPACONT

```
 STS  NORTREFS  NOAMBIGC   RTEREF  HNPACODE   ATTRIB   RTEMAP
 — — — — — — — — — — — — — — — — — — — — — — — — — — — —
 902       911         2   ( 51)     ( 1)     ( 0)     ( 0)
```

The following figure shows an example of Table HNPACONT:HNPACODE.

Figure 4-5 Example of Table HNPACONT:HNPACODE

```
  FROMDIGS        TODIGS
                    CDRRTMT
- - - - - - - - - - - - - - - - - - - - - - - - - - -
      800             800
                    HRTE   902
      801             809
                    HRTE    1005
```

The following table shows a description of the fields and settings in Table HNPACONT:HNPACODE.

Table 4-2 Description of Table HNPACONT:HNPACODE

Field	Description	Settings
FROMDIG	From digits	FROMDIG - Enter a string when the leading three digits represent an office code within the home numbering plan area (HNPA). This number represents either a single code or the first in a block of consecutive codes that have the same input data.
TODIGS	To digits	TODIG - When field FROMDIGS represents a single code, enter the same single code as in the field FROMDIGS. When field FROMDIGS represents the first number of a block of consecutive numbers, enter the last number of the block.
CDRRTMT	Code type, route reference, and treatment - This field consists of subfield code type (CD).	CD - LRTE (Enter LRTE for Local Route.) RR - Enter the route reference index of the route list in subtable HNPACONT: RTEREF (at the same position service numbering plan area as this subtable) to which translation proceed.

Table LINEATTR sets the attributes of the line. This location is where you define the pretranslator and the HNPACONT index. The following figure shows an example of Table LINEATTR.

Figure 4-6 Example of Table LINEATTR

```
LNATTIDX LCC CHGCLSS COST SCRNCL LTG STS PRTNM LCANAME ZEROMPOS TRAFSNO
 MRSA    SFC LATANM MDI   IXNAME DGCLNAME FANIDIGS
        RESINF
                              OPTIONS
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   300   PBX  NONE NT NSCR   0 902 PBX   NLCA   NONE   0
  NIL NILSFC NILLATA 0 NIL      NIL   00
          N
                                $
```

The following figure provides a description of the fields and settings in Table LINEATTR.

Table 4-3 Description of Table LINEATTR (Sheet 1 of 4)

Field	Subfield	Entry	Description
LNATTIDX		Numeric (0–31,999)	Line attribute index. Enter the index. into Table LINEATTR.
LCC		Alphanumeric (up to 8 characters) or NLCC	Line class code (LCC). Enter the LCC assigned to the line attribute index. The LCC of an existing tuple cannot be changed. If there is no LCC, enter NLCC.
CHGCLSS		CAM0, CAM1, CAM2, CAM3, CSD0, DAT0, DAT1, DAT2, DAT3, DIHS, DLHS, DLLS, INW0, LAM0, LCDR, MBG, NONE, RCFW, SPCL, TRMB, TWX0, WAT0	Charge class. Enter the charge class assigned to the line attribute index. Otherwise, enter NONE. **Note:** With Bellcore CDE format, the entry is NONE except in offices with the Overseas Operator Center (OOC): AMA Modernization feature.
COST		HI, LO, NT	Class of service tone. Enter Class of service tone; NT for No Tone, HI for high tone, and LO for low tone.
SCRNCL		Alphanumeric (up to 4 characters) or NSCR	Class of service screening. Enter NSCR if screening by class of service is not required. If screening by class of service is required, enter the name of the class of service subtable assigned to the line attribute index.

Table 4-3 Description of Table LINEATTR (Sheet 2 of 4)

Field	Subfield	Entry	Description
LTG		Numeric (0–9,998)	Line treatment group. Enter the line treatment group number assigned to the line attribute index. The line treatment group number discriminates between customer lines assigned to the same line class code but with different routing or screening patterns.
STS		Numeric (up to 3 digits)	Serving translation scheme (STS). Enter the serving numbering plan area (NPA) assigned to the line attribute index. The STS of an existing tuple cannot be changed.
PRTNM		Alphanumeric (up to 4 characters) or NPRT	Standard pretranslator subtable name. Enter the index to Table STDPRTCT. When.standard pretranslation is not required, enter NPRT
LCANAME		Alphanumeric (1 to 8 characters) or NLCA	Local calling area screening subtable name. Enter the name of the local calling area subtable assigned to the line attribute index when screening of local central office codes is required. When screening of local NNX codes is not required, enter NLCA.
ZEROMPOS		Alphanumeric (up to 10 characters) or NONE	Zero minus position. Enter the position in the position table to which operator (0-) calls are routed when a line attribute is configured for operator (0-) and special toll (0) dialing. Otherwise, enter NONE.
TRAFSNO		Numeric (0–127)	Traffic separation number. Enter 0 when a traffic separation number is not required. Otherwise, enter the source and destination traffic separation number (1 to 127) assigned to the line attribute index.

Table 4-3 Description of Table LINEATTR (Sheet 3 of 4)

Field	Subfield	Entry	Description
MRSA		Alphanumeric (up to 8 characters) or NIL	Message rate service area. Enter NIL when multiunit message rate (MUMR) services billing records are not required. When MUMR billing records are required for calls to numbers resulting in a type of call of NP (no prefix), enter a message rate service area (MRSA) name as datafilled in Table MRSANAME field MRSA.
SFC		Alphanumeric (up to 6 characters) or NILSFC	International subscriber feature class. Enter NILSFC when the switching unit does not have an international load.
LATANM		Alphanumeric (up to 8 characters)	Local access and transport area name. Enter the name of the local access and transport area assigned to the line attribute index.
MDI		Numeric (0–1,023)	Metering data index. Enter 0 when the switching unit does not have an international load.
IXNAME		See subfields	International translations system start. This field consists of subfield XLASYS and XLANAME.
	XLASYS	AC, AM, CT, DN, FA, FT, OFC, NSC, PX, NIL	International translations system. When the switching unit has an international load, enter the head table name where translation starts, and datafill refinement XLANAME. For loads that are not international, enter NIL and leave refinement XLANAME blank.

Table 4-3 Description of Table LINEATTR (Sheet 4 of 4)

Field	Subfield	Entry	Description
			For an MDC equipped with the Open Number Translations feature, enter PX to direct the call to the translator name specified in refinement XLANAME. Translation selector NET, network type DOD must be datafilled in Table IBNXLA. When the entry is other than PX or NIL, a DFIL117 log is generated and the call is sent to call not accepted (CNAC) treatment.
	XLANAME	Alphanumeric (1 to 8 characters)	International translations name. Enter the index into the head table referenced by field XLASYS.
DGCLNAME		Alphanumeric (up to 8 characters) or NIL	Digit analysis tables entry point. Enter NIL when the switching unit does not have an international load. When the switching unit has an international load, enter a digit analysis name to serve as the entry point into the universal digit analysis Tables DGHEAD and DGCODE.
			The name entered here must appear in Table DGHEAD field DGNAME.
FANIDIGS		Numeric (00–99)	Flexible ANI information digit pairs. Enter the flexible automatic number identification [FANI] information digit pair assigned to the line attribute index when the switching unit is equipped with the Flexible ANI Information Digit Assignment feature. Otherwise, enter 00.
RESINF		See subfields	Residential enhanced services information. This field consists of subfield RESINFO and refinements CUSTGRP, SUBGRP, and NCOS.
	RESINFO	Y, N	RES information selector. Enter N when the line attribute is not required to support RES lines. Leave refinements CUSTGRP, SUBGRP, and NCOS blank.

Table LTCALLS sets the routing on a call type and numbering plan. A tuple must exist for every call type, otherwise the DMS switch rejects the call. This allows for different routing based on different call type. The following figure shows an example of Table LTCALLS.

Figure 4-7 Example of Table LTCALLS

```
       LTID                           XLARTSEL
                                                  OPTIONS
- _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
ISDN  150 PUB                        XLALEC  300
                                              (EA   MCI222 Y)$
ISDN  150 INWATS  XLAIBN  300         ISDN2 0   0
                                          (INCLID SUPPRESS)$
ISDN  150 WATS  XLAIBN  300           ISDN2 0   0$
ISDN  150 FX   XLAIBN  300       PBXGROUP 0   0
                                     (SIDXLA    PRIFX Y Y N)$
ISDN  150 TIE              RTEREF   IBNRTE  1007
                                                              $
```

The following table provides a description of the fields and settings in Table LTCALLS.

Table 4-4 Description of Table LTCALLS (Sheet 1 of 4)

Field	Subfield	Entry	Description
LTID		See subfields	Logical terminal identifier. This field consists of subfields LTGRP, LTNUM, and CALLTYPE.
	LTGRP	Alphameric (up to 8 characters)	Logical terminal group. Enter the logical terminal group name.
	LTNUM	1–1022	Logical terminal number. Enter the logical terminal number within the group.
	Call type	ASDS, FX, INWATS, LDS, PUB, PVT, TIE, WATS,	Call type. Enter the call type associated with the LTID. The DMS switch can associate more than one type with the same identifier. Select from the following list of call types.
			• ASDS (Accunet Switched Digital Service) is an integrated services access (ISA) route selector used to route AT&T Accunet CALLS.
			• FX (foreign exchange) provides a subscriber's location with the equivalent of local service from a distant exchange.

Table 4-4 Description of Table LTCALLS (Sheet 2 of 4)

Field	Subfield	Entry	Description
			• INWATS (Inward Wide Area Telecommunications Service) is a form of long distance service that allows a subscriber to receive calls originating within specified service areas, without a charge to the caller.
			• LDS (long distance service) is an ISA route selector used to route AT&T world connect (international) calls.
			• PUB (public). A carrier can provide this call type.
			• PVT (private) provides private telephone services to a specific organization.
			• TIE (tie line) is a type of call that occurs on private lines between PBXs.
			• WATS (Wide Area Telecommunications Service) is provided by operating companies to permit subscribers to make calls over an access line to telephones in a specific zone.
XLARTE	XLARTE	RTEREF, XLAIBN, XLALEC	Translations route. Enter one of the following translations routes.
			• RTEREF when translation is done by a specific table and index, such as OFRT, IBNRTE, and other routing tables.
			• XLAIBN for integrated business network (IBN) translations. This selection is used only in PBX or centrex offices.
			• XLALEC for local exchange carrier translations, such as plain old telephone service (POTS), or in PBX or centrex type offices. When the entry in subfield CALLTYPE is PVT, INWATS, or TIE the switch requires no other data.
			The entry of XLARTE - XLAIBN selection allows routing of the outgoing call to be altered such that the LINEATTR selected with the XLAIBN route selector is used for basic call screening only.

Table 4-4 Description of Table LTCALLS (Sheet 3 of 4)

| Field	Subfield	Entry	Description
	LINEATTR	0–31, 999	Line attributes index. Enter the index into Table LINEATTR for service-related data.
			INDEX - The number of the route in the IBNRTE table.
	CUSTGRP	Alphanumeric (up to 16 characters)	Customer group name. Enter customer name associated with an IBN station.
	SUBGRP	0–7	Subgroup number. Enter the subgroup number that further defines the selection of the CUSTGRP.
	NCOS	0–511	Network class of service. Enter the network class of service (NCOS) that determines the facilities to which the network user has access.
OPTIONS		EA, INCLID, LPIC, SIDXLA	Options - This field consists of subfield logical terminal option (LTCOPT) and refinements router name (RTRNAME), treatment with no service Identifier (TREAT_NO_SID), no call screen (NO_CALL_SCREEN), and route on translations route (ROUTE_ON_XLARTE).
			LTOPT - SIDXLA. Enter SIDXLA to allow service identifier OUTWATS Banded call type.

Table 4-4 Description of Table LTCALLS (Sheet 4 of 4)

Field	Subfield	Entry	Description
			RTRNAME - Enter the OUTWATS router name built in Table ISAXLA for routing OUTWATS Banded Service.
			TREAT_NO_SID - Y - This field determines whether calls without an associated service identifier should be sent to treatment. Enter Y to indicate that the call should be sent to treatment. Enter N to route the call using the numbering plan indicator, network specific facility, and the called digits.
			NO_CALL_SCREEN - Y - This field allows call screening on the line attribute index to be avoided. Enter Y to indicate that validation is not done on the directory number. Enter N to indicate that call screening is done using the line attribute index defined in field LINEATTR.
			ROUTE_ON_XLARTE -Y - This field determines whether a call is routed through public or private translations based on the entry in field XLARTE rather than the NPI in the setup message. Enter Y to indicate that the XLARTE overrides the NPI. Enter N to indicate that the NPI determines the type of translation.

Call type significance

The call type is conveyed between switches by the setup protocol message. For PRI, the call type determines the translations that are used to route an incoming call. There is no global significance to the call type at any certain point. the call type is significant only to the local PRI. Once inside the next exchange, it is discarded and subsequent legs of the same call can have different call types. As an example of call type, most data applications use public-switched networks; therefore, only use the public call type. The following figure shows an example of a public-switched network.

Figure 4-8 Public-switched network
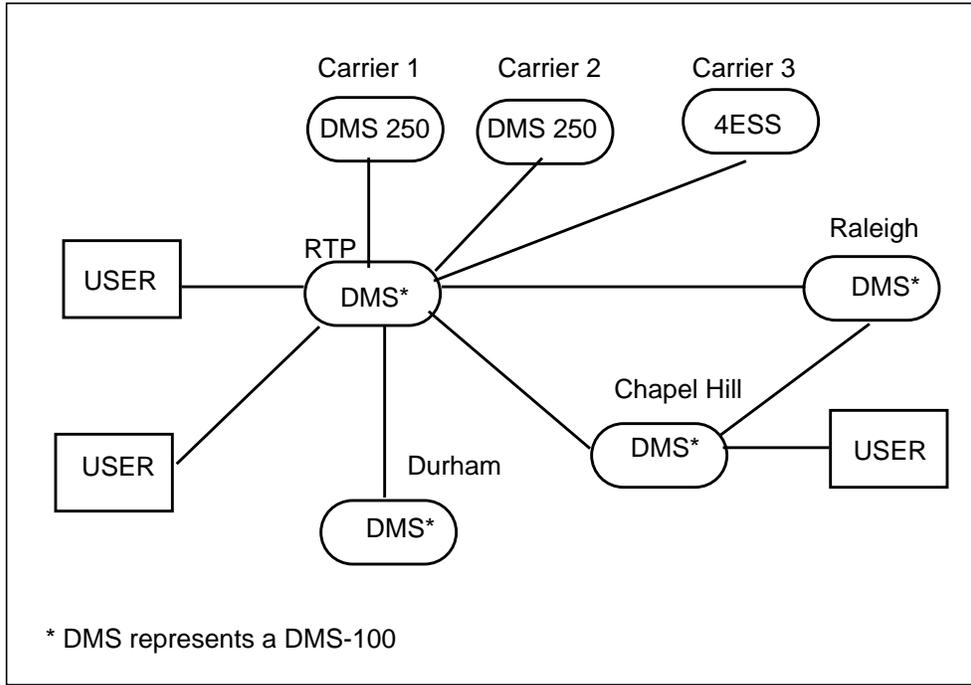
The PUB call type is used for the everyday numbering plan, which usually consists of a 1 + 7 digit local directory number, and 10 CAC + 1 800 dialing to get to the destination.

Subscribers who normally connect their equipment with dedicated lines (shown by the dashed lines in the following figure), use the TIE call type to use subscriber-specific features. The private call type replaces the TIE call type. The following figure shows an example of a tie line.

Figure 4-9 Tie line
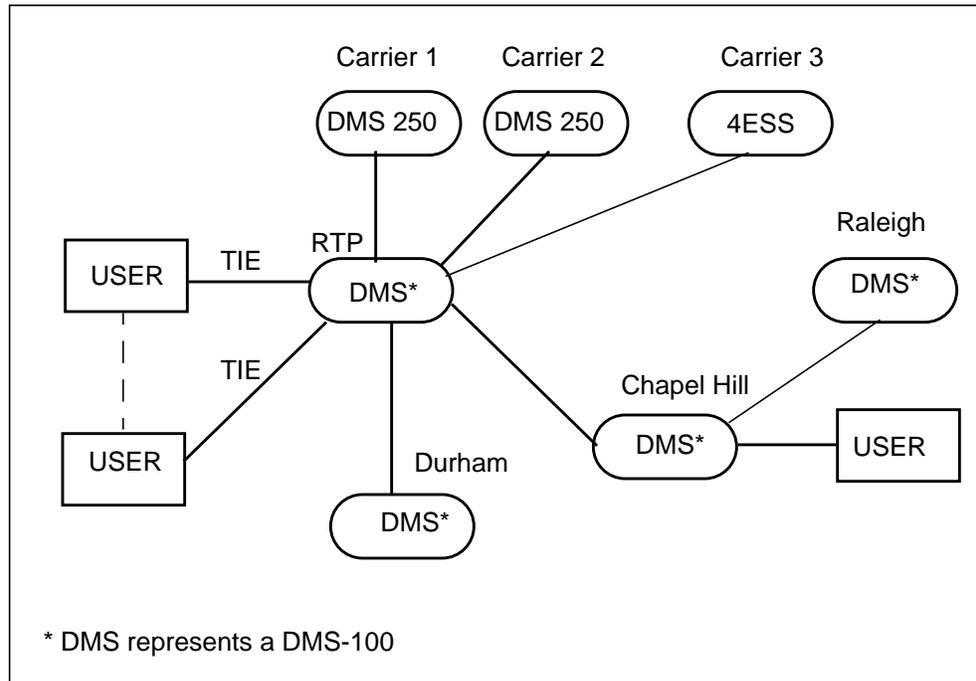
Use the FX call type to connect foreign exchanges (central offices). In the following figure, RTP is the central office (CO). Raleigh, Chapel Hill, and Durham are COs in adjacent cities. The subscribers subscribe to a foreign exchange so they can make calls and receive calls from any of these cities as local calls (calls with no charges). Before PRI, a dedicated line ran from each CO to the PBX. With PRI, an FX call type uses the same PRI span. The following figure shows an example of foreign exchange lines.

Figure 4-10 Foreign exchange lines
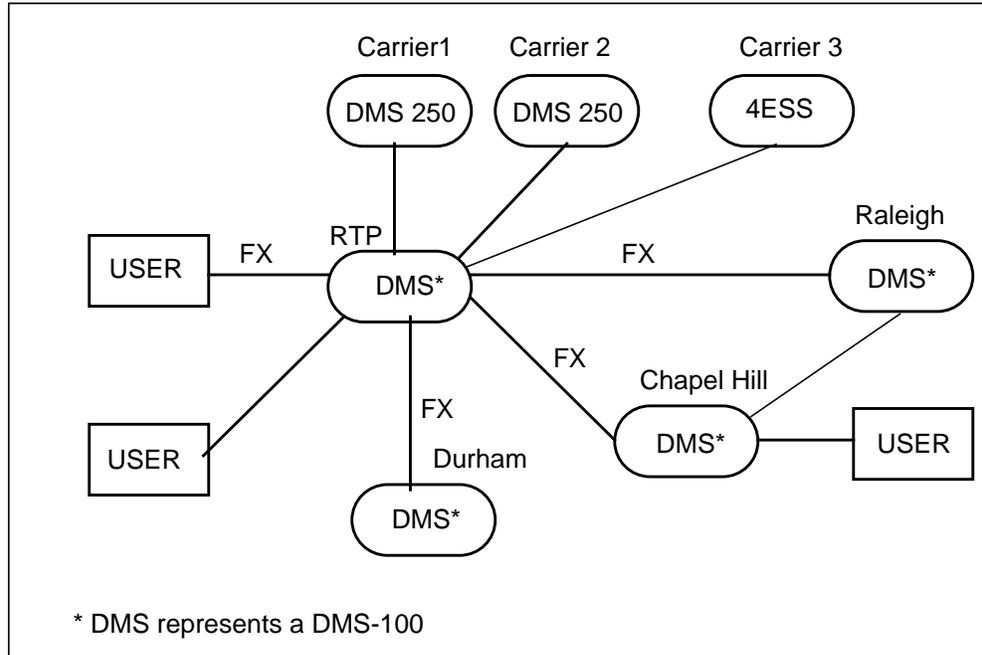
The network specific facilities (NSF) and the numbering plan indicator (NPI) transmit the call type.The following table shows the call-by-call and integrated service access availability by DMS call type.

Table 4-5 Call by call and integrated service access

DMS call type	NTNA (ISA)	NI (call by Call)
Private	Yes	No
Public	Yes	Yes
INWATS	Yes	Yes
OUTWATS	Yes	Yes
Tie	Yes	Yes
FX	Yes	Yes
Hotel/Motel	No	Yes
Selective Class of Call Screening	No	Yes
Note: Both NI-1 and NI-2 support the concept of identifying the call type and service separately from the channels available.		

Part V
Facility Related Features

Facility related features involve the physical custom configuration and are applicable to all PRI customers regardless of their application.

Part IV: "Facility Related Features" contains the following chapters:

- PRI Sizing with Virtual Facility Groups
- PRI Backup D-Channel

5 PRI Sizing with Virtual Facility Groups (VIRTGRPS)

Description

VIRTGRPS can be used to restrict the size of a trunk on a per call-type basis.

Tables STDPRTCT and STDPRT translate the call before normal translations. Nortel uses these tables to route the call to a VIRTGRP before normal translations. STDPRTCT has the name specified in Table LINEATTR while Table STDPRT routes on the dialed digits The call will be routed from STDPRTCT to IBNRTE where a VFG selector routes it to VIRTGRPS. The call will then continue through normal translations. The figures below show the table flow for Table STDPRTCT as well as an example table.

Figure 5-1 Table flow for Table STDPRTCT

Figure 5-2 Example of Table STDPRTCT
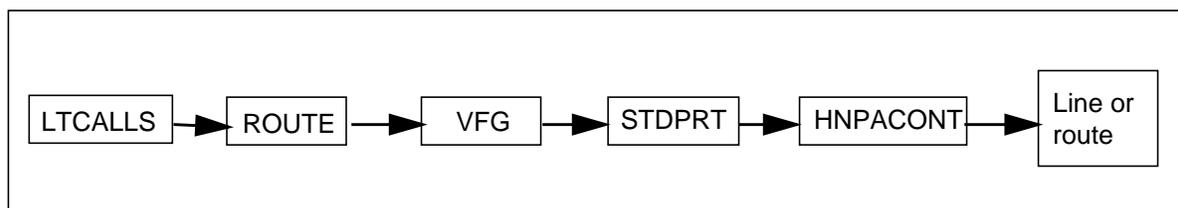
```
              EXTPRTNM   STDPRT   AMAPRT
------------------------------------------------
                PBX    (  1)   (  0)
```

Table STDPRTCT:STDPRT

The following figure below shows an example of Table STDPRTCT:STDPRT.

Figure 5-3 Example of Table STDPRTCT:STDPRT

```
    FROMDIGS              TODIGS
                               PRETRTE
-------------------------------------------------------
       548                 548
                 T DD 0    IBNRTE 1000   3 15     NONE
       549                 549
                 T DD 0    IBNRTE 1001   3 15     NONE
       550                 550
                 T DD 0    IBNRTE 1002   3 15     NONE
       551                 551
                 T DD 0    IBNRTE 1003   3 15     NONE
```

The following table below shows a description of the fields and settings in Table STDPRTCT:STDPRT.

Table 5-1 Description of Table STDPRTCT:STDPRT (Sheet 1 of 2)

Field name	Description	Settings
FROMDIG	From digits	FROMDIG - Enter the digit or digits translated. When the entry represents a block of consecutive numbers, enter the first number in the block.
TODIG	To digits	When field FROMDIGS represents a block of consecutive numbers, enter the last number in the block. Otherwise, the entry is equal to the entry in field FROMDIGS.
PRETRTE	Pretranslation route	PRERTSEL - Enter T since translations will route to another Routing table that will use the VFG selector.
	Type of call	TYPCALL - Enter the type of call: DD (direct dial), NL (nil), NP (no prefix), or OA (operator assisted).
	Number of prefix digits	NOPREDIG - Enter the number of digits that are interpreted as prefix digits.
	Table identifier	TABID - Enter IBNRTE because this is the table name to which translation routes.
	Key	KEY - Enter the index into the IBNRTE table.
	Minimum digits received	MINDIGSR - Enter the minimum number of digits collected before routing the call.

Table 5-1 Description of Table STDPRTCT:STDPRT (Sheet 2 of 2)

Field name	Description	Settings
	Maximum digits Received	MAXDIGSR - Enter the maximum number of digits collected.
	Position	POS - Enter the type of position in Table POSITION that translation is routed to. Otherwise, the value of this field is NONE.

Table VIRTGRPS

Table VIRTGRPS limits the trunk group size and specifies the new LINEATTR for routing. The figure below shows an example of Table VIRTGRPS.

Figure 5-4 Example of Table VIRTGRPS

```
     KEY                                          DATA
                                                     OPTIONS
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
    ERIC SIZE    1 POTS  9022225804  300 Y
                                                        $
```

The table below shows a description of the fields and settings in Table VIRTGRPS.

Table 5-2 Description of Table VIRTGRPS (Sheet 1 of 2)

Field name	Description	Settings
KEY	Virtual Facility Group Key	VIRTGRP - Enter a user defined VFG name.
DATA	Virtual Facility Group Type	VFGTYPE - Enter SIZE to provide sizing capabilities.
	Size (0-2048)	SIZE - Enter the number of simultaneous calls allowed for the VFG..
	Incoming Type	INCTYPE - Enter POTS if the call is entering the Plain Ordinary Telephone Service translation environment.
BILLNUM	Billing Number	BILLNUM - Enter the 10-digit billing number to which the next leg of the is charged. When the call is charged to the originators billing number for the next leg of the call, enter N.

Table 5-2 Description of Table VIRTGRPS (Sheet 2 of 2)

Field name	Description	Settings
LINEATTR	Line Attribute Index	LINEATTR - Enter the line attribute index that specifies the translations and screening tables used for the next leg of the call.
LINECDR	Line Call Detail Recording	LINECDR - Enter Y when CDR is required to record virtual line type calls. Enter N when CDR is not required.
OPTIONS	Options	OPTION - Enter EA to indicate Equal Access. Enter the name assigned to the primary inter-LATA carrier (PIC) in Table OCCNAME. Choice - Enter Y when the caller is allowed to dial a 10xxx perfix to choose a carrier manually. Enter N when the caller is not allowed.

The routing table example is illustrated in the Trunk Routing section using the HNPACONT tables.

6 PRI Backup D-Channel

Ordering code

Functional group ordering code: NI000011

Functionality ordering code: not applicable

Release applicability

BCS36 and up

Prerequisites

To operate, PRI Backup D-channel has the following prerequisites:

*   NI0 ISDN Base, NI000007

*   MDC - MDC Minimum, MDC00001

Description

The Backup Data provides a hot standby alternate path only. Nothing else is affected. This capability also provides a backup D-channel to be used when the primary D-channel is out of service. Normally, the primary D-channel is in the inservice (INS) state and the backup D-channel is in the standby (STB) state. In a trouble situation, the system automatically switches the activities on the D-channels (for example, when a carrier or trunk at the switching node at the far end fails, or when there are hardware problems at the DMS-100). When you busy an INS D-channel, a switch of activities to the STB D-channel occurs automatically. Switching manually to backup D-channel can also be done from a MAP (maintenance and administration position) terminal.

Operation

Datafill the DCHBCKUP subfields in Table TRKSGRP to define the backup D-channel. The DCHNL subfields in Table TRKSGRP are the same as the DCHBCKUP subfields. Detail datafill descriptions are in the BASE Service Capability section of this document.

Limitations and restrictions

Primary Data and Backup Data must be on the same peripheral.

Backup Data must be a different and higher number than the primary.

Datafill example for Table TRKSGRP

The following example shows sample datafill for Table TRKSGRP.

Figure 6-1 MAP display example of Table TRKSGRP

```
   SGRPKEY          CARDCODE
                                             SGRPVAR
  _____

    SL1NTPRI 0 DS1SIG
ISDN 2 2 87Q931 1 N STAND NETWORK PT_PT USER N UNEQ
30 N STRA DTCI 0 0 24 64K HLC
(DTCI 0 1 24 64K HDLC) $
```

Part VI
ISP Data Related Features

ISP in data customer related features applies specifically to internet service providers uing PRI.

Part VI: "ISP Data Related Features" contains the following chapters:

- PRI Call Forward/Interface Busy
- PRI ISP Even Call Distribution

7 PRI Call Forward/Interface Busy

Call Forward/Interface Busy ordering codes

Functional group ordering codes: NI000047

Functionality ordering codes: not applicable

Release applicability

NA013 and up

Requirements

The CFIB feature has no functional group requirements.

Description

The Call Forward/Interface Busy (CFIB) feature provides the capability to forward calls to a remote directory number (DN) when the routelist to the base DN is busy. The term "Interface" in this feature refers to the routelist entry in the routing tables. A routelist is considered busy when all routes in the routelist are call processing busy, out-of-service, or unavailable. In such situations, when the base DN subscribes to the CFIB feature, the call is redirected to a new DN, also known as the remote DN.

The targeted customers for CFIB are the internet service providers (ISP). One application of this feature is to forward the calls from a location in one time zone, whenever the routelist is busy, to another location in a different time zone where there may be less traffic. Another application of this feature is to provide a way to handle routing during disaster situations that cause the routelist to be unavailable.

The basis for CFIB subscription is by individual DN. All DNs that subscribe to CFIB are referred to as base DNs in this document. The DNs to which the calls are forwarded are referred to as remote DNs. The originating DN is the DN of the user that calls the base DN.

Operation

When a call to a base DN fails due to the routelist being call processing busy, out-of-service, or unavailable and when the base DN subscribes to CFIB, then the switch forwards the call to a remote DN based on the bearer capability of the incoming call. The switch forwards the call to the remote DNs provided the following conditions are met:

- the call is a circuit-mode call
- this feature supports the bearer capability of the call
- the maximum redirection count is not reached

The redirection data, which consists of the original called number (OCN), the redirecting number (RGN), and the redirecting reason (RGR), are sent to the originator and the terminator.

Limitations and restrictions

The limitations and restrictions that follow apply to the For use only in Translation, Card, Servord, OParms, Alarm and Recovery modules.

- The base DN and the remote DN must be assigned on different switches. Therefore, CFIB can only be activated once for each call in the base SPCS.
- The remote DN must not subscribe to CFIB. The software does not enforce this restriction.
- Only the following types of originators support the CFIB feature:
  - PRI trunks
  - ISUP trunks
  - IBN MF trunks
  - BRI lines
  - POTS lines
  - RES lines
  - IBN lines
- The routelists that are still being referenced by the CFIB feature DNs in the DNROUTE table should not be deleted from the routing tables. This restriction is not enforced by software.
- This feature provides no software restriction to prevent other trunks besides National ISDN (NI2) and NTNA PRI trunks from being provisioned in the routelist to the base DN, However, testing is performed with NI2 and NTNA PRI trunks only.
- The calls forwarded as a result of CFIB must be terminated on ISUP trunks only.

- The provisioned billing DN in Table DNROUTE must be a 10-digit number.
- The capability of displaying information on the origination and termination display sets is not supported.

Interactions

The paragraphs that follow describe how CFIB interacts with other functionalities.

When Call Forward (CFW-all kinds), Advanced Intelligent Network (AIN) redirections, key short hunt (KSH) or line overflow to DN (LOD) occurs before CFIB, the original called number (OCN) and the original redirecting reason (ORR) are provided by these redirection features. Redirecting number (RGN) and redirecting reason (RGR) are provided by the CFIB. In these cases, the RGN is the base DN provisioned with CFIB. The RGR is user busy.

Only AIN redirections are allowed to occur after CFIB. In this case, CFIB provides the OCN (the base DN) and ORR (user busy). AIN redirections provide the RGN and RGR.

When the switch uses a virtual facility group (VFG) to route calls to a base DN, the size limitation in VIRTGRPS is the total number of calls present on the base DN route plus the number of active CFIB calls.

Billing

The CFIB feature generates two automatic message accounting (AMA) records. The feature generates one AMA record for the originating DN to the base DN portion of the call. The feature generates a second AMA record for the base DN to the remote DN portion of the call. The second AMA record uses a special billing DN, which Table DNROUTE provisions. The CFIB feature appends the ISDN core module (Module 70/71) to the AMA record of the base DN to the remote DN portion of the call.

Datafill related to Call Forward/Interface Busy for Table CFIBDATA

The table that follows provides the datafill related to Call Forward/Interface Busy feature for Table CFIBDATA. This table includes only those fields that apply directly to the Call Forward/Interface Busy feature, and gives the

flexibility to route calls of different Bearer Capabilities to different and remote DNs.

Table 7-1 Datafill related to Table CFIBDATA

Field	Subfield	Entry	Explanation and action
CFIBID		A string of up to 16 characters	CFIB identifier. This is the key to a tuple in Table CIFBDATA. This identifier is specified in Table DNROUTE for a DN subscribing to the CFIB option.
RDNSPCH		DN (maximum 15 digits)	DN to which the call is forwarded when the incoming bearer capability is Circuit-Mode Speech.
RDN3KAUD		DN (maximum 15 digits)	DN to which the call is forwarded when the incoming bearer capability is Circuit-Mode 3.1 KHz Audio.
RDN64KUD		DN (maximum 15 digits)	DN to which the call is forwarded when the incoming bearer capability is Circuit-Mode Unrestricted Digital Information (6 kbit/s)
RDNUDAD		DN (maximum 15 digits)	DN to which the call is forwarded when the incoming bearer capability is Circuit-Mode Unrestricted Digital Information adapted from 56kbit/s to 64kbit/s.

Datafill example for Table CFIBDATA

The following figure shows sample datafill for Table CFIBDATA.

Figure 7-1 MAP example for Table CFIBDATA

```
 CFIBID   RDNSPCH    RDN3KAUD   RDN64KUD    RDNUDAD
 ----------------------------------------------------
 CFIB1    5551000    5551007    7915551111  8015551003
```

SERVORD

The CFIB feature uses the Service Order System (SERVORD).

SERVORD limitations and restrictions

The CFIB feature has no SERVORD limitations or restrictions.

SERVORD prompts

The following table provides the SERVORD prompts used to add to a DN or block of DNs.

Table 7-2 SERVORD prompts for For use only in Translation, Card, Servord, OParms, Alarm and Recovery modules. (Sheet 1 of 2)

Prompt	Correct input	Explanation
SNPA	Valid SNPA provisioned in Table TOFCNAME	Serving numbering plan area. Enter the area code for the DN.
BLOCK_OF_DNS	Yes or No	Block of directory numbers. Enter Yes when CFIB option is to be provisioned for a range of DNs.
DN	Valid DN	Directory number. The switch displays this prompt when the response to the BLOCK_OF_DNS is NO. Enter a valid DN to which CFIB is to be provisioned.
FROM_DN	Valid DN	From directory number. The switch displays this prompt when the response to the BLOCK_OF _DNS is Yes. Enter the first DN in the range of DNs.
TO_DN	Last 3 digits in the range of DNs.	To directory number. The switch displays this prompt when the response to the BLOCK_OF _DNS is Yes and follows the FROM_DN prompt.
VDNTYPE	CFIB	Virtual directory number type. Enter CFIB for the Call Forward/Interface Busy feature.
TABNAME	OFRT, OFR2, OFR3, OFR4. IBNRTE, IBNRT2, IBNRT3, IBNRT4	Table name routelist. Enter the routing table that contains the routelist to the base DN.

Table 7-2 SERVORD prompts for For use only in Translation, Card, Servord, OParms, Alarm and Recovery modules. (Sheet 2 of 2)

Prompt	Correct input	Explanation
INDEX	0–1023	Route index. Enter the route index of the table entered in response to the TABNAME prompt.
CFIBID	Valid index in Table CFIBDATA	CFIB identifier. Enter the index into table CFIBDATA.
CFIBSBDN	10-digit DN	CFIB special billing directory number. Enter the special billing DN used to bill the base DN to remote DN portion of the CFIB call.
RPNPP	Y or N	Remote party number presentation parameter. Enter Y or N to indicate whether the presentation of the remote party number (remote DN) is allowed.

SERVORD example to add CFIB

The following SERVORD example shows how to add the CFIB feature to a block of DNs with the SERVORD NEWDN command in prompt mode.

Figure 7-2 SERVORD example for CFIB in prompt mode

```
>NEWDN
SONUMBER:  NOW 99 6 18 PM
>
SNPA:
> 613
BLOCK_OF_DNS:
> YES
FROM_DN:
>7222000
TO_DN:
> 300
VDNTYPE:
> CFIB
CFIBSBDN:
> 6137221010
TABNAME:
> IBNRTE
INDEX:
> 20
CFIBID:
> CFIB1
RPNPP:
>Y
OPTION:
> $
```

The following SERVORD example shows how to add CFIB to a block of DNs with the SERVORD NEWDN command in no-prompt mode.

Figure 7-3 SERVORD example for CFIB in no-prompt mode

```
NEWDN $ 613 YES 7222000 300 CFIB 6137221010 IBNRTE 20 CFIB1
Y $
```

Datafill related to CFIB for Table DNROUTE

The following table provides the datafill related to the CFIB feature for Table DNROUTE. This table is datafilled automatically with Table DNINV by SERVORD. This datafill is included only to help in understanding the

translation and in changing a field withoug deleting the feature from the DN. This table includes only those fields that apply directly to the CFIB feature.

Table 7-3 Datafill related to table DNROUTE

Field	Subfield	Entry	Explanation and action
FEAT		CFIB	Feature. Enter CFIB for the Call Forward/Interface Busy feature
TABNAME		OFRT, OFR2, OFR3, OFR4, IBNRTE, IBNRT2, IBNRT3, IBNRT4	Table name. Specify the routelist that is to be used to route the incoming call to the base DN.
INDEX		1–1023	Enter the index into the routing table.
CFIBID		A string of up to 16 characters	Index of Table CFIBDATA used to get information about remote DNs.
CFIBBASE		common language location identifier (CLLI)	This PRI CLLI becomes the originator of the forwarded call to the remote DN, when all routes in the routelist are busy.
CFIBSBDN		A 10-digit number	Billing number to be used for the base DN to remote DN portion of the CFIB call
RPNPP		Y or N	Indicate whether the presentation of the remote party number (remote DN) is allowed. The default is Y.

Datafill example for Table DNROUTE

The following figure shows sample datafill for Table DNROUTE.

Figure 7-4 MAP example for Table DNROUTE

```
FEATURE   TABNAME   INDEX CFIBID   CFIBBASE CFIBSBDN     RPNPP
------------------------------------------------------------
CFIB      IBNRTE    20    CFIB1    CLLI1    6135551010    Y
```

Translations table flow

The following includes the CFIB feature translations tables:

- DNROUTE
- CFIBDATA

The following flowchart provides the CFIB feature translations process.

Table flow for CFIB
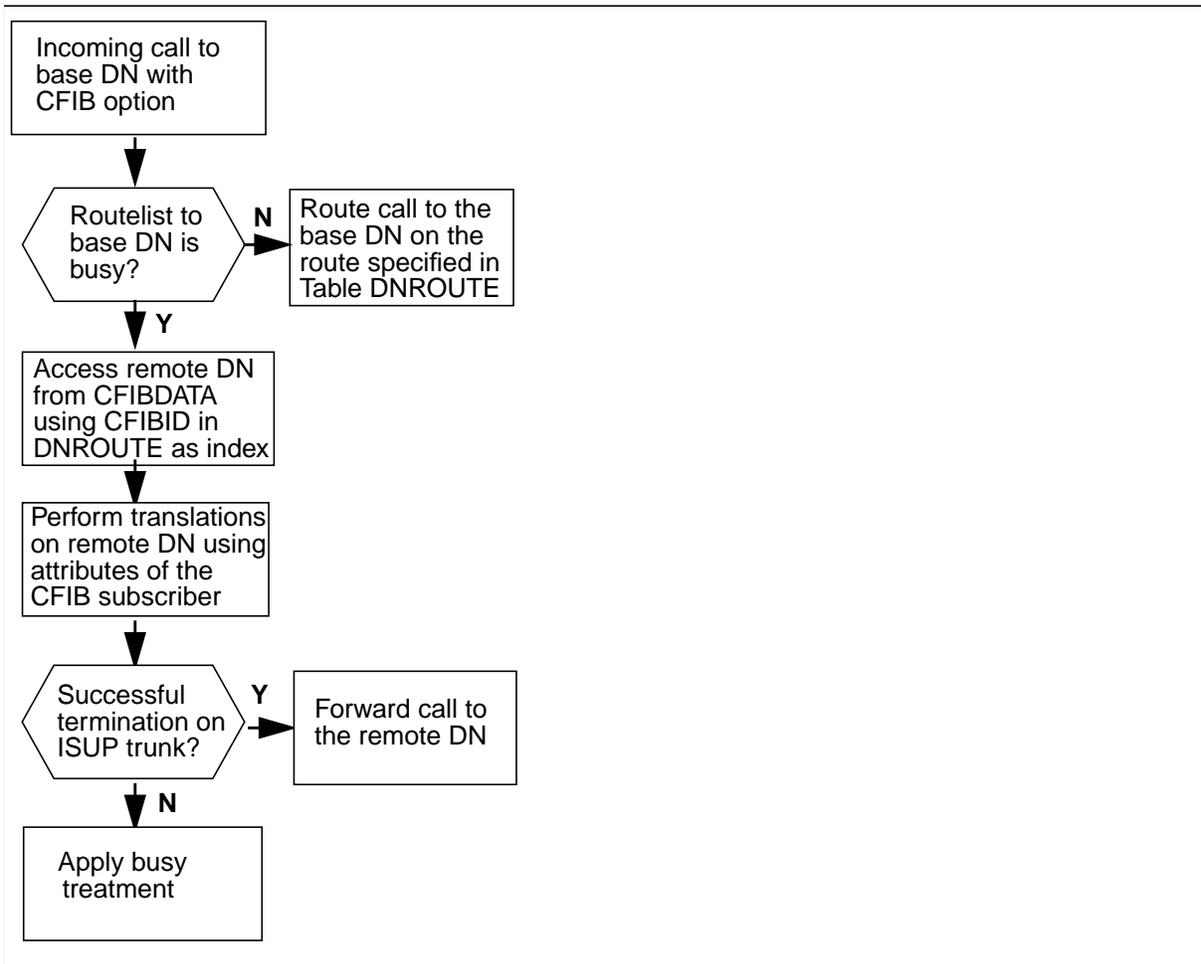
The table that follows lists the datafill content used in the flowchart.

Table 7-4 Datafill example for CFIB

Datafill table	Example data
CFIBDATA	CFIB1 5551000 5551007 7915551111 8015551003
DNROUTE	613 722 8880 FEAT CFIB IBNRTE 20 CFIB1 ISDN 1012 6135551010 Y

8 PRI ISP Even Call Distribution

ISP Even Call Distribution ordering codes

Functional group ordering codes: NI000036

Functionality ordering codes: not applicable

Release applicability

NA010 and up

Description

ISP Even Call Distribution provides the following functionality to internet access providers (IAP) and internet service providers (ISP):

- an even distribution of calls across a set of possible trunk members

- support of a maximum of 220 primary rate interface (PRI) trunk groups in a PRI route list

- prevention of call retranslation between PRI trunk groups (and reduced use of real time) through the use of super-groups

- a maximum number of trunk group attempts

Setting a maximum number of trunk group attempts conserves real time during busy periods. With this limit, the switch searches only a fixed number of trunk groups during call routing. During busy periods, the switch returns an all trunks busy (ATB) indication instead of providing no treatment or delayed treatment to a caller. The maximum number of trunk group attempts can range from 1 to 220.

> *Note:* ISP Even Call Distribution introduces a recommended maximum number of attempts of 50 (based on 23 members in each trunk group). A warning message displays if the operating company sets the maximum number of trunk group attempts to a value greater than 50.

Operation

The circular hunt capability is an advantage for switches connected to ISPs. Before the ISP Even Call Distribution feature, the following problems existed in these switches:

- overuse of the first trunk group on the list

- retranslation used additional processor real time

- killer trunks repeatedly selected

ISP Even Call Distribution reduces or eliminates these problems.

The process of finding an IDL channel to complete a call involves two hunting algorithms. The first determines which trunk group will be selected. This is done with the SG selector in the routing table. The second algorithm determines which channel within the trunk group will be selected. This is done with the Selection Sequence (SELSEQ) Table TRKGRP.

The SuperGroup is a list of trunk groups in Table SUPERTKG indicated in the SG route. The order the trunk groups are selected will be either Clockwise (CHCL) or Counterclockwise (CCHCL). Clockwise will start with the first Supertrunk trunk group and proceed down the list. Counterclockwise will start with the last Supertrunk trunk group and continue up the list. Valid routing tables are: IBNRTE, IBNRT2, IBNRT3, IBNRT4, OFRT, OFR2, OFR3, OFR4, HNPSCONT, FNPACONT (RTEREF), ACRTE, PXRTE, CTRTE, FARTE, OFCRTE, FTRTE, and NSCRTE. When the number of attempts (ATTEMPTS) is reached without finding an IDL trunk, the call is terminated and an All Trunks Busy (ATB) indication is sent.

Table TRKGRP determines how the channels within the trunk group will be selected. Field SELSEQ will be set to either SG_CWCTH, or SG_CCWCTH. When SG_CWCTH is used, the switch starts after the last searched member and continues clockwise or ascending order. When it searches to the last member without finding a IDL member, it proceeds to the next trunk group as described above. When SG_CCWCTH is used , the switch starts after the last searched member and continues counterclockwise or descending order. When it searches to the first member without finding a IDL member, it proceeds to the next trunkgroup as described above.

The following table shows the field descriptions for the trunk group selection sequence in Table IBNRTE.

Table 8-1 Description of fields in Routing table

Field	Subfield	Entry	Description
IBNRTSEL		SG	Routed through a tuple in Table SUPERTKG.
	ALGORITHM	CHCL, CHCCL	Algorithm. Enter one of the following: • CHCL (circular hunt in clockwise direction) • CHCCL (circular hunt in counterclockwise direction)
	ATTEMPTS	Numeric (1–220)	Attempt number. The maximum number of trunk groups to be tested for a free trunk member. When greater than 50, DFIL616 is generated. Maximum of 50 is recommended.
	SUPERTKG_ NAME	Alphanumeric (1 to 16 characters)	Super-trunk group name. Enter the name of the super-trunk group listed in Table SUPERTKG.

Even call distribution through CHCL and SG_CWCTH

The combination of CHCL and SG_CWCTH provides the best selection process for a complete clockwise search at the trunk group and member levels. The following table shows an example of table data entries for this combination.

Figure 8-1 Example of table entries for CHCL and SG_CWCTH combination

---

ROUTE TABLE (OFRT)
100   (SG **CHCL** 50   ISP1GRP1) $

Table SUPERTKG
ISP1GRP1 (ISP1TRK01)(ISP1TRK02)....(ISP1TRK07)...(ISP1TRK60)$

Table TRKGRP
ISP1TRK01 PRA 0 NPDGP NCRT **SG_CCWCTH** N (ISDN 11) $ $
ISP1TRK02 PRA 0 NPDGP NCRT **SG_CCWCTH** N (ISDN 12) $ $
....
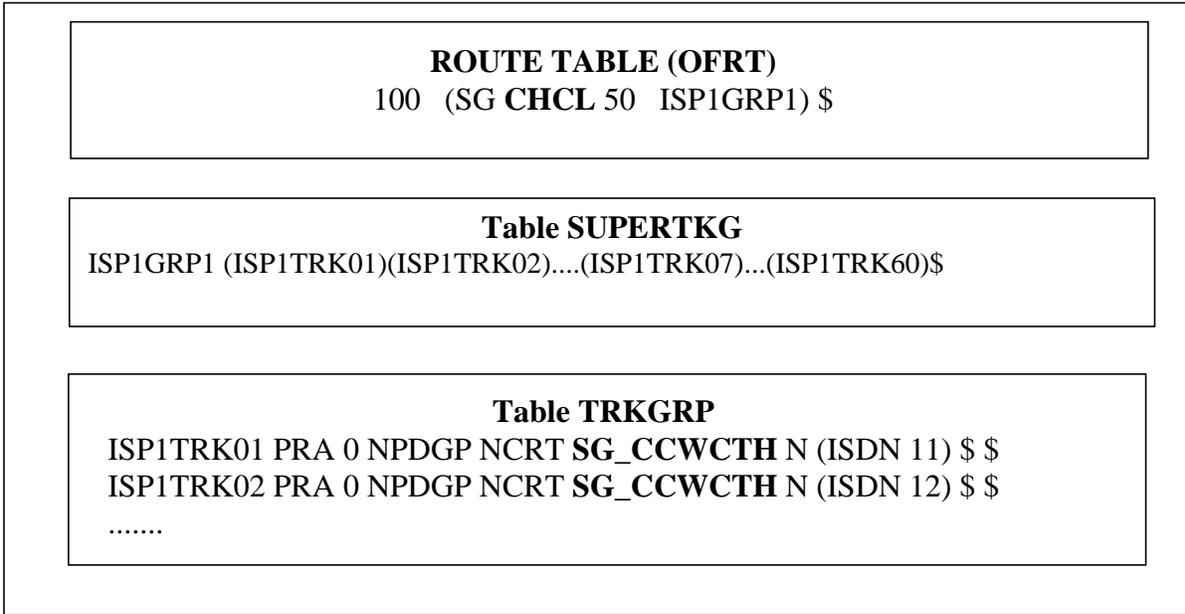
For this example, call processing routes a call through Table OFRT tuple 100. This starts a circular hunt search in the clockwise direction (CHCL) in Table SUPERTKG tuple ISP1GRP1.

For the first call, the search starts from trunk group ISP1TRK01. For this trunk group, the SELSEQ field from Table TRKGRP is SG_CWCTH. The search for a free trunk member starts from the first member of ISP1TRK01 until it reaches the last member. When the selection process finds a free trunk member, it offers the trunk member to the call.

For subsequent calls, the search starts from the last accessed trunk group for routing the call (for example, ISP1TRK02). In the trunk group ISP1TRK02, the selection sequence (SELSEQ) is SG_CWCTH. With this selection sequence, the search for a free member starts from the trunk member after the last searched trunk member and continues to (and includes) the last member in this (ISP1TRK02) trunk group. When the selection process cannot find a free trunk in this trunk group, it selects (in a clockwise direction) the next trunk group in the super group ISP1GRP1 to route the call.

The following figure shows a representation of the selection process when CHCL and SG_CWCTH are datafilled. The ellipse indicates that all members of the trunk groups in a super trunk group are searched as though they were all in one group.

Figure 8-2 Representation of the route selection process when CHCL and SG_CWCTH are datafilled
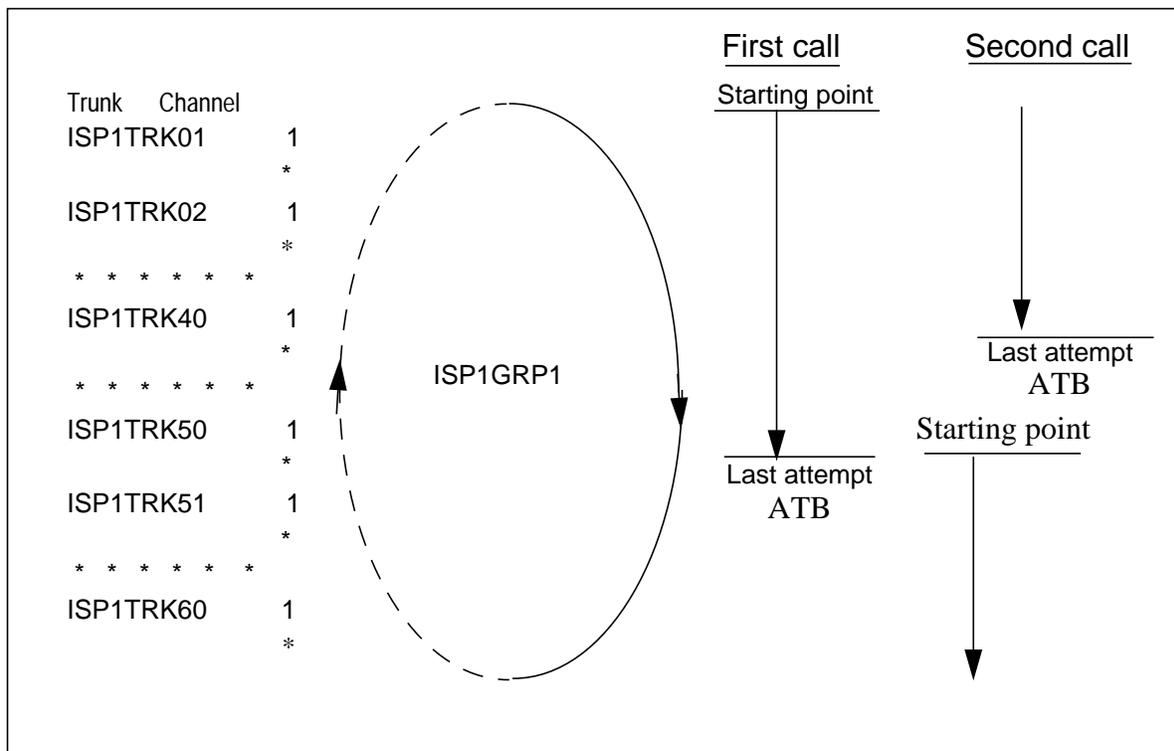
When 50 trunk groups (for example, from ISP1TRK01 to ISP1TRK50) are searched and no free trunk member is available, the DMS sends an ATB indication and stops the call routing process. When the call routing process accesses tuple 100 in Table OFRT to route the next call, the search starts from the first trunk member of the trunk group ISP1TRK51 and continues in a clockwise direction. When the selection process finds no free member in trunk group ISP1TRK60, the search returns to the first trunk group (ISP1TRK01). Because the ATTEMPTS value in this example is set at 50, the search stops at ISP1TRK40. When an idle member cannot be found. The DMS switch sends an ATB indication and stops the call routing process.

Even call distribution through CHCCL and SG_CCWCTH

The combination of CHCCL and SG_CCWCTH provides the best selection process for a complete counterclockwise search at the trunk group and member levels. The following figure shows an example of table data entries for this combination.

Figure 8-3 Example of table entries for CHCCL and SG_CCWCTH combination

```
ROUTE TABLE (OFRT)
100   (SG CHCCL 50   ISP1GRP1) $


Table SUPERTKG
ISP1GRP1 (ISP1TRK01)(ISP1TRK02)....(ISP1TRK07)...(ISP1TRK60)$


Table TRKGRP
ISP1TRK01 PRA 0 NPDGP NCRT SG_CWCTH N (ISDN 11) $ $
ISP1TRK02 PRA 0 NPDGP NCRT SG_CWCTH N (ISDN 12) $ $
.......
```

For this example, a call is routed through Table OFRT tuple 100. This starts a circular hunt search in a counterclockwise direction (CHCCL) in Table SUPERTKG tuple ISP1GRP1.

For the first call, the search starts from trunk group ISP1TRK01. For this trunk group the SELSEQ field from Table TRKGRP is SG_CCWCTH. This starts the search from the last member of ISP1TRK01 and continues until it reaches the first member. When no free member is found, the call proceeds to the last trunk group (ISP1TRK60). When the selection process finds a free trunk member, the member is offered to the call.

For the subsequent calls, the selection process starts the search from the last accessed trunk group for routing the call (for example, ISP1TRK59). In trunk group ISP1TRK59, the SELSEQ is SG_CCWCTH. This selection sequence starts the search from the trunk member previous to the last searched trunk member. The selection process searches up to the first member in this (ISP1TRK59) trunk group for a free member. When it cannot find a free member in this trunk group, the selection process selects the next trunk group (in reverse order) in the super group ISP1GRP1 to route the call.

When 50 trunk groups (for example, ISP1TRK01 and from ISP1TRK60 to ISP1TRK12) are searched and no free trunk member is available, the DMS switch sends an ATB indication and stops the call routing process. When the routing process accesses tuple 100 in Table OFRT to route the next call, the search starts from trunk group ISP1TRK11 and continues in a counterclockwise direction. When no free member is available in trunk group ISP1TRK01, the search proceeds to the last trunk group (ISP1TRK60) and

continues the search for a free member. Because the ATTEMPTS value in this example is 50, the search for this call stops at ISP1TRK21, when an idle member cannot be found. The DMS switch sends an ATB indication and stops the call routing process.

The following figure shows a representation of the route selection process when CHCCL and SG_CCWCTH are datafilled.

Figure 8-4 Representation of the route selection process when CHCCL and SG_CCWCTH are datafilled
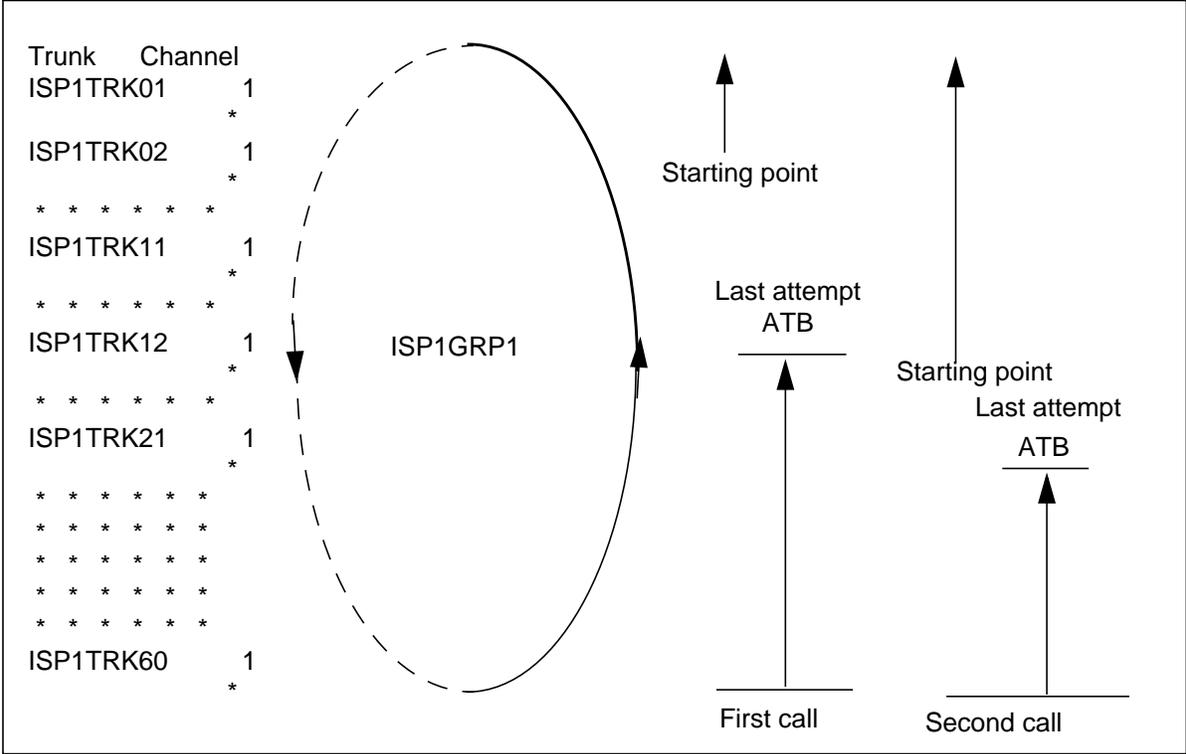
Limitations and restrictions

The following limitations and restrictions apply to ISP Even Call Distribution:

- ISP Even Call Distribution supports only PRI trunks

- ISP Even Call Distribution supports only narrow-band PRI calls

- ISP Even Call Distribution supports only NTNI and NTNA PRA trunk types

- For complete circular selection with super-groups, use either the SG_CWCTH or SG_CCWCTH selection algorithm for all trunk groups in a super-group. Do not "mix" these selection algorithms among trunk

groups in a super-group. For example, when using CHCL, use SG_CWCTH. When using CHCCL, use SG_CCWCTH.

- The recommended ATTEMPTS value of 50 is based on a total of 23 B-channels in each trunk group. With non-facility associated signaling (NFAS), reduce the ATTEMPTS value so that the total number of B-channels searched in a super-group does not exceed 1150.

Datafill sequence

The following table lists the tables that require datafill to implement ISP Even Call Distribution. The tables are listed in the order in which they are to be datafilled.

Table 8-2 Datafill tables required for ISP Even Call Distribution

Table	Purpose of table
TRKGRP	Trunk group. This information includes the B-channel selection sequence.
Routing tables	The routing tables specify the route or routes to follow after call translation.

Datafilling Table TRKGRP

The following table shows the datafill specific to ISP Even Call Distribution for Table TRKGRP. Only those fields that apply directly to ISP Even Call Distribution are shown. Note that this also applies to universal and IBN translations.

Table 8-3 Datafilling Table TRKGRP (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
GRPKEY		See subfield	Group key. This field consists subfield CLLI.
	CLLI	Alphanumeric (1–16 characters)	Common language location identifier. This subfield specifies the CLLI code assigned to the trunk group in Table CLLI.

Table 8-3 Datafilling Table TRKGRP (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
GRPINFO		See subfield	Variable group data. This field consists of subfields GRPTYP, TRAFSNO, PADGRP, NCCLS, SELSEQ, BILLDN, LTID, and OPTIONS. Only subfield SELSEQ applies to ISP Even Call Distribution.

	SELSEQ	SG_CWCTH, SG_CCWCTH	Selection sequence.
			
			• Enter SG_CWCTH to specify super-group circular hunting in the clockwise direction.
			
			   Note: For best results, use the SG_CWCTH algorithm with the CHCL super-group selection algorithm (defined in the routing table).
			
			• Enter SG_CCWCTH to specify super-group circular hunting in the counterclockwise direction.
			
			   Note: For best results, use the SG_CCWCTH algorithm with the CHCCL super-group selection algorithm (defined in the routing table).

Datafill example for Table TRKGRP

The following example shows sample datafill for Table TRKGRP.

Figure 8-5 MAP display example for Table TRKGRP

```
   GRPKEY          GRPINFO
   _____

   64K7DT0 PRA 0 NPDGP NCRT SG_CWCTH N (ISDN 20) $ $
   64K8DTO PRA 0 NPDGP NCRT SG_CCWCTH N (ISDN 21) $ $
```

Methods of changing subfield SELSEQ value

Changes to the trunk selection method for a trunk group (subfield SELSEQ) are allowed for some trunk selection methods, under certain conditions. The following table lists the methods of changing the value of subfield SELSEQ.

Table 8-4 Methods of changing SELSEQ value

Current SELSEQ value	New SELSEQ value	Method of changing SELSEQ value
ASEQ or DSEQ (without feature AD3901) (Note)	SG_CWCTH, SG_CCWCTH	Change the entry in Table TRKGRP by placing the trunk group (all B- and D-channels) in installation busy (INB) state. The change is in effect from the next call after dynamic download is complete.
ASEQ or DSEQ (with feature AD3901) (Note)	SG_CWCTH, SG_CCWCTH	Change the entry in Table TRKGRP without changing the B- and D-channel states. The change is in effect from the next call after dynamic download is complete.
CWCTH or CCWCTH	SG_CWCTH, SG_CCWCTH	Change the entry in Table TRKGRP without changing the B- and D-channel states. The change is in effect from the next call after dynamic download is complete.
MIDL or LIDL	SG_CWCTH, SG_CCWCTH	Deprovision the interface and provision the interface again.

Part VII
Private Branch Exchange (PBX) Related Features

PBX features apply specifically to voice/data PRI customers.

Part VII: "Private Branch Exchange (PBX) Related Features" contains the following chapters:

- PRI Message Waiting Indicator
- PRI Networked ACD
- PRI Equal Access
- PRI Bearer Capability Routing
- PRI Calling Line Identification
- PRI Network Name Delivery
- PRI Network Ring Again
- PRI Release Line Trunk
- PRI with Semipermanent Packet

9 PRI Message Waiting Indicator

Ordering codes

Functional group ordering code: NI000052

Functionality ordering code: NA

Release applicability

NA011 and up

Description

Message services, such as meridian mail, notify a user that a message has been left on their mailbox by use of a Message Waiting Indicator (MWI). This MWI is typically done with a stutter dial tone or a lit indicator feature key. This service is done on a switching node basis. The Network MWI feature allows this message waiting indicator to be sent over PRI to notify a user on a different node. Therefore, one mailbox system can be used across several switching nodes. This is accomplished via the FACILITY and FACILITY REJECT messages.

Datafill related to Table NETNAMES

Table NETNAMES contains the network name to be used in Table MSGRTE and the NMSTBRTE option. The NMSTBRTE option is used so the facility messages will be routed through Table MSGRTE.

Table 9-1 Datafill related to Table NETNAMES

Field Name	Description	Setting
NETNAME		Logical Network Name Used to access DNGRPS and DNATTRS
EXTNETID		External Network Identifier 0 - 32767, used to externally idenfity network This must match the adjacent network ID. On an M1 it is called PNI.

Table 9-1 Datafill related to Table NETNAMES

Field Name	Description	Setting
NETDIGS		Network Digits 0 to 10 digits in network
NETOPTS	FACREJ	Facility Reject Message will be sent to originator when it cannot be properly routed to destination.
	NINTNRAG and NMSTBRTE (done together)	Non-Interworking Ring Again - Occurs when an SS7 call cannot be routed to the NRAG system. TCAP messages routed through MSGRTE.
	NMDSP	Name Display - SETUP message or a Query for the name in SETUP message.
	NMRTNRAG-SUPPRESS	No MSGRTE NRAG - SS7 call that can route by digits and point code. Suppression of DN or Name. INTRNLDN - suppression of DN internal to switch. EXTRNLDN - suppression of DN external to switch. INTRNLNM - suppression of Name internal to switch. EXTRNLNM - suppression of Name external to switch.

Datafill example for Table NETNAMES

The following figure shows sample datafill for Table NETNAMES.

Figure 9-1 MAP example for Table NETNAMES

```
NETNAME EXTNETID NETDIGS
                      NETOPTS
_____

ISDNPRA   2   4
(FACREJ)(NMSTBRTE)$
```

Datafill related to Table MSGRTE

Table MSGRTE analyzes the network name and the digits dialed then routes the messages LOCAL, CCS7, or PRI to the terminating node. These messages

are sent and received by the DMS switch, therefore, this table needs to be filled for the incoming and outgoing messages.

Table 9-2 Datafill related to Table MSGRTE

Field Name	Description	Setting
MSGRTKEY	NETID DIGRANGE FROMDIGS TODIGS	Message Route Key Network name of Customer Group Lower Bound of Digit Range Upper Bound of Digit Range
MSGRTRES	MSGRTSEL PRA	Message Route Selector TRKCLLI - Trunk CLLI DELDIGS - Number of Digits to delete PREDIGS - Enter the Prefix for Message Routing OPTION - NEWNET for new network name (PRA or SS7) NETNAME - Network Name to Replace Destination Address

Datafill example for Table MSGRTE

The following figure shows sample datafill for Table MSGRTE.

Figure 9-2 MAP example for Table MSGRTE

```
                    MSGRTKEY
                                    MSGRTRES
    _____

    ISDNPRA    0000001 9999999
    (PRA M1PRIA 0 0 NEWNET CUST1 $)$
```

Illustration of Network Message Waiting Indicator Example

The following figure shows an example of the Newtork Message Waiting Indicator.

Figure 9-3 Illustration of Network Message Waiting Indicator
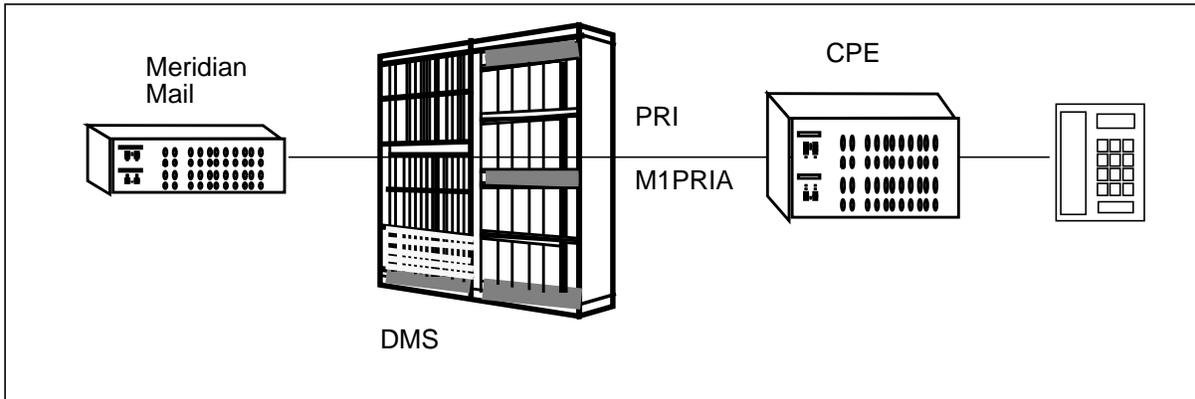
10 PRI Networked ACD

Network Automatic Call Distribution (ACD)

NACD is a feature that allows overflow routes or load sharing across different switches. The existing ACD groups stay the same. NACD provides a link between groups on different switches by use of a few new tables. Communication is accomplished via Remote Service Operations Element in SETUP, ALERTING, FACILITY, and FACILITY REJECT messages.

The following figure illustrates a Network Automatic Call Distribution.

Figure 10-1 Illustration of Network Automatic Call Distribution
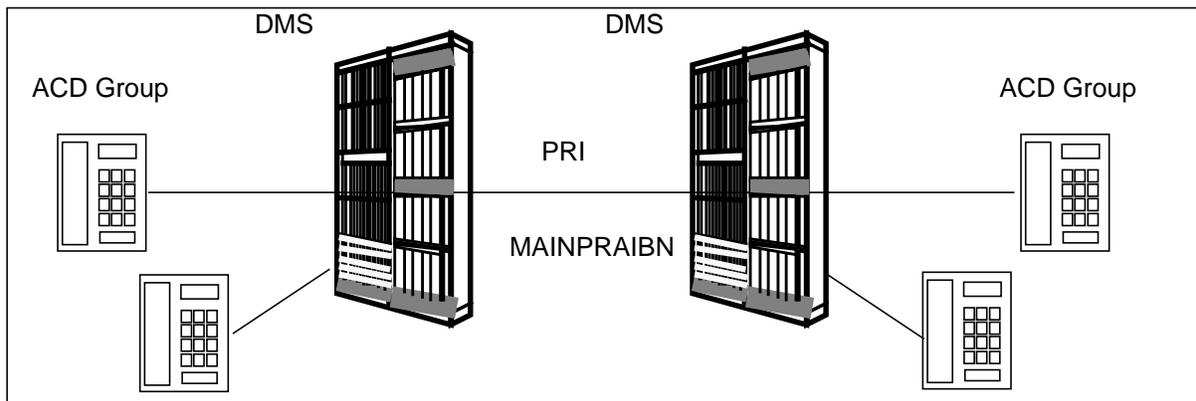
Five tables are associated with networking ACD across different switches.

Figure 10-2 Illustration of NACD Table Flow
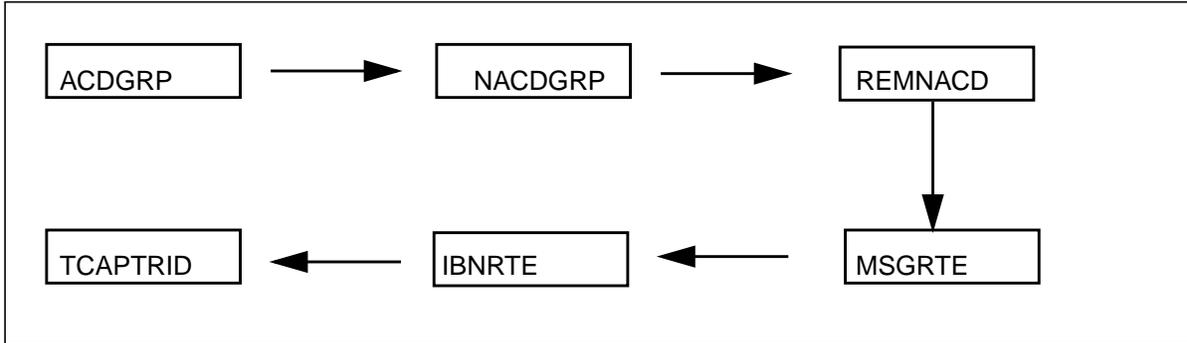
Table ACDGRP defines the individual ACD groups on a node.

Figure 10-3 Example of Table ACDGRP

```
ACDNAME          CUSTGRP ACDRNGTH      THROUTE
    NSROUTE PRIOPRO DBG MAXCQSIZ MAXWAIT
                             ADCMIS
              MSQS DISTRING OBSWTONE
               FRCNGTSV
                             OPTIONS
─────────────────────────────────────────────────────
S2NACD1      S2NACD    12     OFRT    100
        OFRT  100   10  N    2     5
          Y33N            (DEFLOB 100)$
    Y   5 10 15 CALLQ N N N   NONE        N
               N
(AUDIO 60Y AUDIO1)(TMDELOFL3 ALLPRIO)(OVFLINQ OLDEST 4Y 45)
         (MAXCQLMT 3)$
```

Table 10-1 Description of Table ACDGRP

Field Name	Description	Setting
ACDNAME	Name	1-16 characters
CUSTGRP		The customer group to which the ACD group belongs
ACDRNGTH	0 or 12-60	Ringing threshold Max. Time (Sec.) before agent is re-enqueued 0 call is not re-enqueued

Table 10-1 Description of Table ACDGRP

Field Name	Description	Setting
THROUTE	Threshold Route TABNAME INDEX	OFRT or IBNRTE Which route in the table
NSROUTE	Night Service Route TABNAME INDEX	Used when no active agents OFRT or IBNRTE Which route in the table
PRIOPRO	Priority Promotion Time-out	0-255 Expiration time then call goes to higher priority queue. 0 no time-out
DBG	Intraoffice Delayed Billing	Y- Billing starts when call is answered N- Billing stats when caller receives announcement ACD_TOLL_DELAYED_BILLING in Table OFCENG controls this.
MAXCQSIZ	Maximum call Queue size	0-511 0- No queuing capability If queue size is exceeded, overflow route is used.
MAXWAIT	Maximum Wait Time	0-1800 Max. time the call can wait in queue 0- Call is not re-routed.

Table NACDGRP designates which ACD groups are NACD groups and which remote overflow group should be used.

Figure 10-4 Example of Table NACDGRP

```
ACGRP QTHRESH WTHRESH PWF BESTGRP SRVRATE NUMIDLE TIMEIDLE
                                 NTWKGRPS
                OPTIONS
     ─────────────────────────────────────────────
        S2NACD1    2    5    30    N    5    5    5
                                (REM S3NACD1 30)$
                                      $
```

Table 10-2 Description of Table NACDGRP

Field Name	Description	Setting
NTWKGRPS	Network ACD Groups LCL or REM LCLGRP PFW	Overflow to Local(LCL) or Remote(REM) NACD Group 1 to 16 character name of NACD Group Preference Weighting Factor 0-32,767 the higher the number the higher the more desirable the route

Table REMNACD provides routing information about NACD groups in other switches.

Figure 10-5 Example of Table REMNACD

```
REMGROUP       REMOTEDN      ROUTE       OPTIONS
     ───────────────────────────────────────────────
   S3NACD1      9032231871   IBNRTE 888      $
```

Table 10-3 Description of Table REMNACD

Field Name	Description	Setting
REMGROUP	Remote ACD Group	1 to 16 characters
REMOTEDN	Remote Directory Number	DN of Remote ACD Group
ROUTE	Route	OFRT of IBNRTE 0-1023
OPTIONS	Options NONDMS	$ - Remote ACD group is on a DMS switch NONDMS - Remote ACD group is a non-DMS switch. TRGTRI - Target Resource Index of non-DMS switch

Table MSGRTE provides the option to go LOCAL, CCS7, or PRI to the terminating ACD group.

Figure 10-6 Example of Table MSGRTE

```
                    MSGRTKEY
                            MSGRTRES
_____

          PUBLIC   903223    903223
          (PRA MAINPRAIBN 0 N $) $
```

Table 10-4 Description of Table MSGRTE

Field Name	Description	Setting
MSGRTEKEY	NETID DIGRANGE	Network ID Digit Range to and from
MSGRTSEL	LOCAL SS7 PRA	Terminates on this switch Terminates to a CCS7 route Terminates on a PRI route TRKCLLI - Trunk CLLI DELDIGS - Delete Digits PREDIGS - Prefix Digits

Table TCAPTRID limits the number of TCAP transactions.

Figure 10-7 Example of Table TCAPTRID

```
        TCAPAPPL    NUMTRIDS    NUMCOMPS
_____

          NACD        200            0
```

Table 10-5 Description of Table TCAPTRID

Field Name	Description	Setting
TCAPAPPL	NACD	Transaction Capability Application Part Application
NUMTRIDS	0-32, 767	Number of Transaction IDs

11 PRI Equal Access

PRI Equal Access ordering codes

Functional group ordering codes: NI000022

Functionality ordering codes: not applicable

Release applicability

BCS36 and up

Prerequisites

To operate, PRI Equal Access has the following prerequisites:

- NI0 ISDN Base, NI00007
- MDC - MDC Minimum, MDC00001

Description

PRI Equal Access provides basic equal access end office (EAEO) translation capabilities for public calls originating on a PRI trunk. This capability provides transit network selection for public calls.

Operation

Table LTCALLS provides for the routing of calls over the trunk group. The table is datafilled with the trunk group's LTID, the call type, and the equal access routing options.

Billing

PRI Equal Acces does not affect billing.

Station Message Detail Recording

PRI Equal Access does affect Station Message Detail Recording.

Datafilling office parameters

PRI Equal Access does not affect office parameters.

Datafill sequence

The following table lists the tables that require datafill to implement PRI Equal Access. The tables are listed in the order in which they are to be datafilled.

Table 11-1 Datafill tables required for Equal Access

Table	Purpose of table
LTCALLS	Provides the initial translations for calls routed over the trunk group.

Datafilling Table LTCALLS

The following table shows the datafill specific to PRI Equal Access for Table LTCALLS. Only those fields that apply directly to PRI Equal Access are shown. For a description of the other fields, refer to the data schema section of this document.

Table 11-2 Datafilling Table LTCALLS (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
LTID		See subfields	Logical terminal identifier. Datafill subfields LTGNUM and CALLTYP as one concatenated entry. Separate the three values with blanks. You are not prompted for the subfields individually.
	LTGNUM	See subfields	Logical terminal group number. This is made up of subfields LTGRP and LTNUM.
	LTGRP	Alphanumeric	Logical terminal group. Enter the trunk group name from Table LTDEF.
	LTNUM	Numeric	Logical terminal number. Enter the trunk group number from Table LTDEF.
	CALLTYP	PUB	Call Type. Enter PUB for public.
OPTIONS		See subfields	Options
	LTCOPT	EA, LPIC	Line trunk controller routing option. Enter EA for equal access and refinements PIC and CHOICE. Enter LPIC and refinements LCARRIER and LCHOICE or intra-LATA Competition. LPIC allows equal access for all connected intra-LATA calls. Enter a $ to end the tuple.

Table 11-2 Datafilling Table LTCALLS (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
	PIC	Alphanumeric	Primary Inter-LATA carrier. Enter the other common carrier (OCC) name. ***Note:*** The carrier must be specified in Table OCCNAME first.
	CHOICE	Y, N	Choice. Use an equal access plan (EAP) prefix to identify an alternate OCC. Enter Y to use the EAP prefix. Enter N to not use the EAP prefix.
	LCARIER	Alphanumeric carrier name	Primary intra-LATA carrier name. Enter the prescribed carrier name. The carrier name must be datafilled in Table OCCNAME and OCCINFO.
	LCHOICE	Y, N	Intra-LATA choice. Enter Y to indicate the prescribed carrier can be overridden by the specified carrier. Otherwise, enter N.

Datafill example for Table LTCALLS

The following example shows sample datafill for Table LTCALLS.

Figure 11-1 MAP display example for Table LTCALLS

```
LTID                    XLARTSEL
                                            OPTIONS

ISDN 1008   PUB   XLAIBN   0    CUST1    0   3
                                        ( EA MCI N)$
```

Translation verification tools

PRI Equal Access does not affect call routing translations. Refer to PRI Call Routing capability for TRAVER examples using Equal Access.

Sample TRAVER

The following figure illustrates a sample TRAVER for PRI Equal Access.

Figure 11-2   Figure 1 PRI Equal Access TRAVER

```
traver tr spmwits80 103239198211001 b
TABLE TRKGRP
SPMWITS80 PRA 0 PRAC NCRT ASEQ N (PRI 1006) $ $
```

Figure 11-2   Figure 1 PRI Equal Access TRAVER

```
TABLE LTCALLS
PRI 1006 PUB XLALEC 1 613_PKDK_1 L613_PRI_LATA1 (EA SOR323 Y) $
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGER NIL
TABLE LINEATTR
1 1FR NONE NT 0 0 NILSFC 0 NIL NIL 00 613_PKDK_1 NLCA_NILLA_1 $
:CABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
613_PKDK_1 NSCR 613 PKDK NONE N $ $
TABLE RATEAREA
L613_PRI_LATA1 NLCA NIL LATA1 $
TABLE STDPRTCT
PKDK ( 1) ( 0) 2
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
. 10323 10323 EA DD 5 P R323 SOR323 Y OFR4 15 10 18 Y
. . TABLE OFR4
. .    15 CND EA INTNL SK 2
. .       N D ITISUPOG2 0 D088 N
. .       CND ALWAYS SK 1
. .       N D ITISUPOG 15 D138 N
. . EXIT TABLE OFR4
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE STDPRTCT
R323 ( 1) ( 0) 3
. SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IF NP. PLEASE REFER TO
DOCUMENTATION.
. KEY NOT FOUND
. DEFAULT VALUE IS:   N NP 0 NA
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
613 Y 995 1 ( 143) ( 1) ( 84) ( 0) 3 $
. SUBTABLE HNPACODE
. 919 919 HNPA 0
. 821 821 LRTE 821
. SUBTABLE RTEREF
EXIT TABLE HNPACONT
```

Figure 11-2   Figure 1 PRI Equal Access TRAVER

```
LNP00100 SOC Option is IDLE.
LNP Info: Called DN is not resident.
LNP Info: HNPA results are used.
EA:Local override does not apply to this call.
TABLE LATAXLA
TUPLE NOT FOUND
ASSUMED TO BE DEFAULT INTRALATA, INTRASTATE, STD
TABLE OCCINFO
SOR323 0323 EAP Y Y Y Y Y Y N N Y Y Y LONG 0 FGRPC Y N Y N N N N N N Y N N N
N Y
TABLE EASAC
TUPLE NOT FOUND
OVERLAP CARRIER SELECTION (OCS) APPLIES
Using Equal Access (EA) route OFR4 15 from Pretranslation
TABLE OFR4
  15 CND EA INTNL SK 2
     N D ITISUPOG2 0 D088 N
     CND ALWAYS SK 1
     N D ITISUPOG 15 D138 N
EXIT TABLE OFR4
AIN Info Collected TDP: no subscribed trigger.
AIN Info Analyzed TDP: no subscribed trigger.

+++ TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 ITISUPOG2              0889198211001        ST

TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

 +++ TRAVER: SUCCESSFUL CALL TRACE +++
```

SERVORD

PRI Equal Access does not use SERVORD.

12 PRI Bearer Capability Routing

PRI Bearer Capability Routing ordering codes

Functional group ordering codes: NI000008, NI000014

Functionality ordering codes: not applicable

Release applicability

BCS36 and up

Prerequisites

To operate, PRI Bearer Capability Routing has the following prerequisites:

* NI0 ISDN Base, NI000007
* MDC - MDC Minimum, MDC00001

Description

PRI Bearer Capability Routing (BCR) is used when a call needs a certain bandwidth that may or may not be provided through normal translations. BCR ensures that the call will be sent over the appropriate facilities.

BCR is accomplished by special pre-translators called PXLAMAP and XLAMAP for public and private calls respectively. Each table's key fields are written in bold.

BCR is a feature that can also be used with any call type. BCR is used when a call required a certain bandwidth. For example, data or video that require 64kbps channels. Not all links in the Public Switched Telephone Network (PSTN) are 64kbps. In the illustration below, the call is between two customer locations and requires 64kbps bandwidth. The RTP office would route normal calls to Chapel Hill through the 56kbps line, but in this case, the BCR would route it to Raleigh and then Chapel Hill since the complete path is 64kbps.

Figure 12-1 Illustration of Bearer Capability Routing
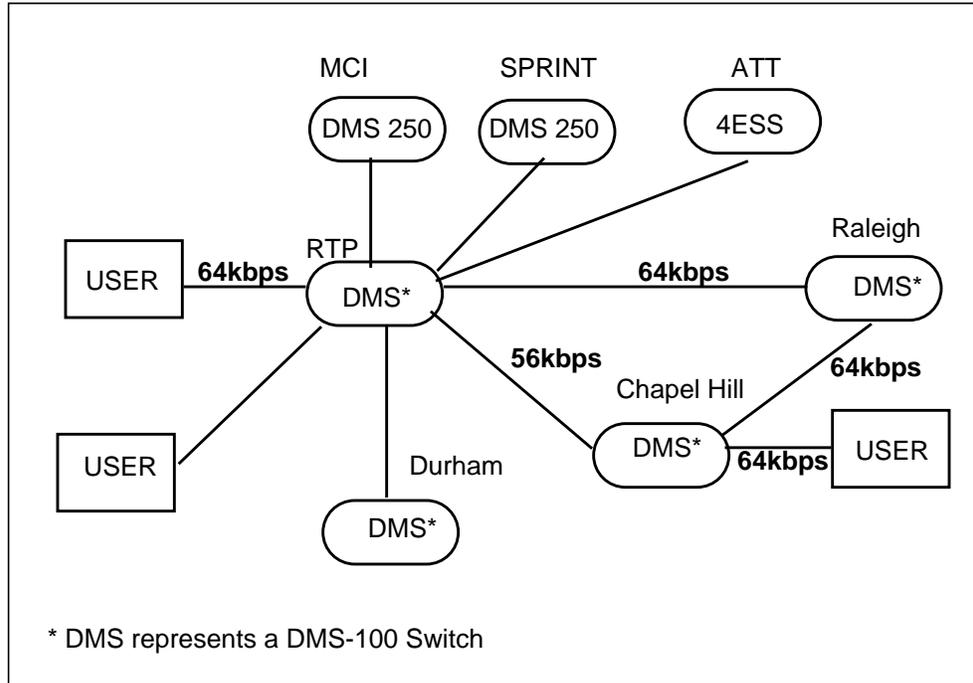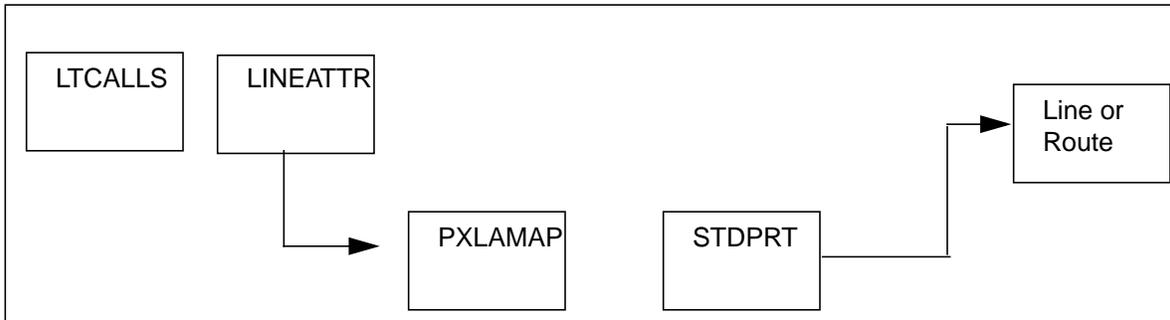

Translations table flow

The following figure illustrates Bearer Capability Routing.

Figure 12-2 Illustration of Bearer Capability Routing.

Billing

When the BD option is datafilled against the customer group in Table CUSTSMDR, and SMDR extension record is generated identifying the type of bearer capability, PRI Bearer Capability Routing affects billing.

Station Message Detail Recording

PRI Bearer Capability Routing does not affect Station Message Detail Recording.

Datafilling Table BCDEF

Table BCDEF (Bearer Capability Definition) defines the different bearer capabilities

The following tables shows the datafill specific to PRI Bearer Capability Routing for Table BCDEF.

Table 12-1 Description of Table BCDEF

Field Name	Description	Settings
KEY	BCNAME	Bearer Capability Name
BCDATA	XFERCAP	Transfer Capability SPEECH - For Voice Calls RESDIG - For 56kbps Transparent Data UNRESDIG - For 64kbps Unrestricted Data AU3_1KHZ - For 3.1kHz Audio Data Transfer Mode
	XFERMOD	CIRCUIT - Circuit Switched PACKET - Packet Data Coding Standard CCITT - CCITT
	CODINGST	NETWORK - Network Specific

The following example shows sample datafill for Table BCDEF.

Figure 12-3 MAP display example for Table BCDEF

```
            KEY                 BCDATA
_____
         64KDATA      UNRESDIG CIRCUIT CCITT
```

Datafilling Table BCCOMPAT

Table BCCOMPAT (Bearer Capability Combatability) shows which bearer capabilities are compatible with each other.

The following table shows the datafill specific to PRI Bearer Capability Routing for Table BCCOMPAT.

Table 12-2 Description of Table BCCOMPATE

Field Name	Description	Settings
KEY	CALLBC (Incoming Call Bearer Capability)	3_1KHZ - Default to NON_PRI Trunks 7_1KHZ - High Quality Audio 56KDATA - Adapted from 64K
	TERMBC (Terminating Bearer Capability)	64KDATA - Clear Channel 64KX25 - X.25 Packet Data 64_RAYE_AD_DATA - Adapted to 64K by Bit-Stuffing DATAUNIT - 56K adapted for 64K same as 56KDATA SPEECH VOICE_DATA - Used on DMS250 for backwards compatability only.

The following example shows sample datafill for Table BCCOMPAT.

Figure 12-4 MAP display example for Table BCCOMPAT

```
                    KEY
_____
            SPEECH     56KDATA
            SPEECH     DATAUNIT
            SPEECH     3_1KHZ
            SPEECH     VOICE_DATA
            64KX25     64KRES
            56KDATA    SPEECH
            56KDATA    DATAUNIT
            56KDATA    3_1KHZ
            56KDATA    VOICE_DATA
            DATAUNIT   56KDATA
            DATAUNIT   64KRES
            64KRES     64KX25
            64KRES     DATAUNIT
            3_1KHZ     SPEECH
            3_1KHZ     VOICE_DATA
            7_KHZ      SPEECH
            VOICE_DATA SPEECH
```

Datafilling Table RCNAME
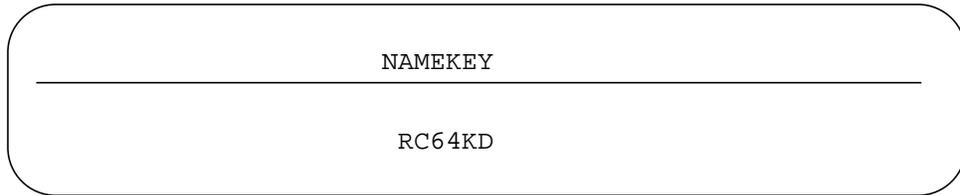
Table RCNAME (Route Characteristic Name) defines valid names.

The following table shows the datafill specific to PRI Bearer Capability Routing for Table RCNAME.

Table 12-3 Description of Table RCNAME

Field Name	Description	Settings
NAMEKEY	Routing Characteristic Name	Found in Table RTECHAR

The following example shows sample datafill for Table RCNAME.

Figure 12-5 MAP display example for Table RCNAME

```
                         NAMEKEY
 _____

                         RC64KD
```

Datafilling Table RTECHAR

Table RTECHAR (Route Characteristics) matches incoming information element data with the GROUPRC listings and determines the RCNAME.

The following table shows the datafill specific to PRI Bearer Capability Routing for Table RTECHAR.

Table 12-4 Description of Table RTECHAR

Field Name	Description	Settings
RCKEY	Routing Characteristics Name RCNAME	From RCNAME
GROUPRC	FIRSTRC	Routing Characteristics Groupings First Group RCSEL - Selector BC BC - Bearer Capability Name from BCDEF

The following example shows sample datafill for Table RTECHAR.

Figure 12-6 MAP display example for Table RTECHAR

```
            RCKEY
                                     GROUPRC
_____

            RC64KD        (BC 64KDATA $) (BC 56KDATA $) $
```

Datafilling Table XLAMAP

Table XLAMAP is the pre-translator for a private call marked with a bearer capability. This table matches the IBN translator and bearer capability then determines the new route or pre-translator.

The following table shows the datafill specific to PRI Bearer Capability Routing for Table XLAMAP.

Table 12-5 Description of Table XLAMAP

Field Name	Description	Settings
XLAKEY	RCNAME	Translations Key
	XLANAME	Routing Characteristics Name - From Table RCNAME Translator Name - From Table XLANAME
DATA	SEL NEWXLA POS EXTRTID	Selector - New Translator Pointer XLA - For Translator Name POSITION - For Operator Position ROUTE - For Route Index New Translator (XLA) in XLANAME Position (POS) TOPS, CAMA, None, etc. External Route Identification (ROUTE) TABID - Table Identifier KEY - Index into Table

The following example shows sample datafill for Table XLAMAP.

Figure 12-7 MAP display example for Table XLAMAP

```
      XLAKEY                          DATA
  _____

      RC64KD     CXLA1            (   XLA RC64XLA)$
```

Datafilling Table PXLAMAP

Table PXLAMAP is the pre-translator for a public call marked with a bearer capability. This table matches the pots translator and bearer capability and then determines the new route or pre-translator.

The following table shows the datafill specific to PRI Bearer Capability Routing for Table PXLAMAP.

Table 12-6 Description of Table PXLAMAP

Field Name	Description	Settings
PXLAKEY	RCNAME LANAME	Translations Key Routing Characteristics Name - From Table RCNAME Translator Name - From Table XLANAME, NCOS, and CUSTHEAD
DATA	SEL NEWXLA LINEATTR EXTRTID	Selector - New Translator Pointer XLA - For Translator Name LINEATTR - For Line Attribute ROUTE - For Route Index New Translator (XLA) in XLANAME Line Attribute Number External Route Identification (ROUTE) TABID - Table Identifier KEY - Index into Table

The following example shows sample datafill for Table PXLAMAP.

Figure 12-8 MAP display example for Table PXLAMAP

```
            PXLAKEY                        DATA
_____

            RC64KD PBX                   XLA DCAC
```

Datafilling Table OFCENG

Table OFCENG has the number of extension blocks needed to store routing characteristics during call processing. One extension block per call.

The following example shows sample datafill for Table OFCENG.

Figure 12-9 MAP display example for Table OFCENG

```
            PARMNAME                      PARMVAL
_____

            NUM_RC_EXT_BLKS                 200
```

Datafilling Table IBNXLA

Table IBNXLA is used for the next route or table for private calls.

The following table shows the datafill specific to PRI Bearer Capability Routing for Table IBNXLA.

Table 12-7 Description of Table IBNXLA

Field Name	Description	Settings
KEY	XLANAME DGLIDX	Translator Name - From XLANAME Digilator Index - Digits to be Replaced
RESULT	TRSEL CONTINUE REPLCODE OPPTION RCNAME	Translator Selector - REPL (Replace) Y - Continue with next Translator N - Restart from Beginning Based on NCOS Replacement Code - Replacement Digits RC - Translations Based on RCNAME

The following example shows sample datafill for Table IBNXLA.

Figure 12-10 MAP display example for Table IBNXLA

```
         KEY
                                           RESULT
_____

     CXLA1    127
              ROUTE N N N 3 N 7 15  NELSONPRI   $
```

TRAVER Examples

The following is an example of the Public BCR TRAVER within the Bearer Capability Routing.

Figure 12-11 Sample TRAVER output for Public BCR

```
>traver tr pri 14 n cdn 4762222 tns na cic '333' bc 64kdata b
Warning: Routing characteristics are present.
         Originator must be able to send in
         characteristics specified.
TABLE TRKRCSEL
.TUPLE NOT FOUND
 . Default Value is ( BC ON)(OSA OFF)(CDN OFF) l <(TNS OFF) ( SR OFF)( PF
OFF)$
TABLE RTECHAR
  . RC64KD (BC 64KDATA $) (BC 56KDATA $)$
TABLE TRKGRP
PRI14 PRA 0 NPDGP NCRT ASEQ N (ISDN 150) $ $
TABLE LTCALLS
ISDN 150 PUB XLALEC 300 $
TABLE CUSTSTN
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP NIL
TABLE LINEATTR
300 PBX NONE NT NSCR 0 902 PBX NLCA NONE 0 NIL NILSFC NILLATA 0 NIL NIL 00
N $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE PXLAMAP
.RC64KD PBX ( XLA DCAC)$
TABLE STDPRTCT
DCAC ( 1) (0) 0
.SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE BILLING. CALL TYPE
DEFAULT IN NP. PLEASE REFER TO DOCUMENTATION.
.10333 10333 S DD 5 PRI17 3 15 NONE
AIN Infor Collected TDP: no subscribed trigger.
AIN Info Analyzed TDP: no subscribed trigger
.SUBTABLE AMAPRT
.KEY NOT FOUND
.DEFAULT VALUE IS: NONE OVRNONE N

+++TRAVER:SUCCESSFUL CALL TRACE+++

DIGIT RANSLATION ROUTES
1 PRI17    N CDN E164 L 4762222 NIL_NSF BC 64KDATA
TREATMENT ROUTES. TREATMENT IS: GNCT
1 120TONE
+++TRAVER: SUCCESSFUL CALL TRACE+++
```

13 PRI Service Identifier Routing

The Service Identifier (SID) identifies a preferred route to the customer. Any call type, except PUB, can use a SID routing. The PBX routes the call by sending a specific SID in the Setup message via the NSF IE. The example shown below is used for a foreign exchange scenario, although it can also be used with long distance to access carriers.

Figure 13-1 Public-switched network

SID sends a call directly to a specific trunk with minimal call processing. This is especially useful with TIE and FX call types for which the subscriber knows the destination. DIS routing allows subscribers to do their own routing.

With the SIDXLA option selected in Table LTCALLS, the DMS switch takes the incoming SID and determines the route in Table ISAXLA. The diagrams

also show sizing through virtual facility groups. The following figure shows the table flow for Service Identifier Routing.

Figure 13-2 Table flow for Service Identifier (SID) Routing
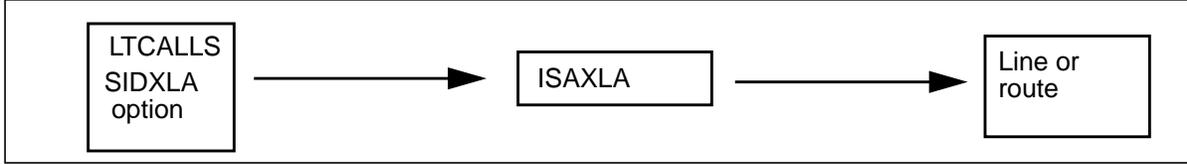
The following figure shows the table flow for routing with sizing.

Figure 13-3 Table flow for (SID) routing with sizing
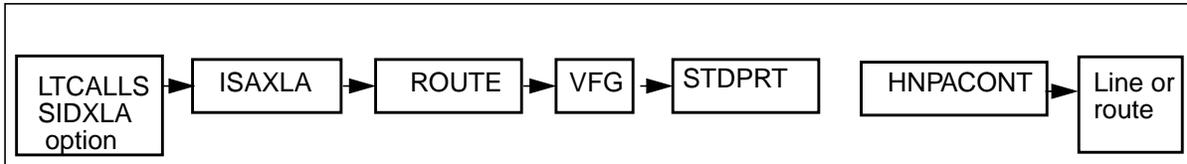
The following figure shows the table flow for routing with or without sizing.

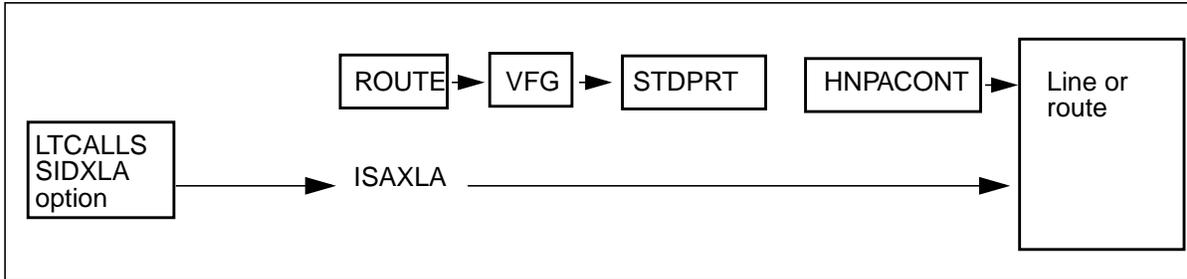**Figure 13-4 Table flow for (SID) routing with or without sizing**

Table ISAXLA

Table ISAXLA reviews the incoming SID and sends the call directly to a route. Figure 13-5 shows an example of Table ISAXLA.

Figure 13-5 Example of Table ISAXLA

```
IRTRNAME   SIDFROM   SIDTO          RTEID
-----------------------------------------------------
PRIFX      0         0              (IBNRTE     7)$
PRIFX      4         4              (IBNRTE   505)$
PRIFX      5         5              (IBNRTE  1004)$
PRIFX      6         6              (IBNRTE  1005)$
PRIFX      7         7              (IBNRTE  1006)$
```

Table 13-1 shows a description of the fields and settings in Table ISAXLA.

Table 13-1 Description of Table ISAXLA

Field	Subfield	Entry	Description
IRTRNAME		Alphanumeric (up to 128 8-character names)	Router name. Enter the router name to be used in Table LTCALLS under the XLAISA selector, or in field IRTRNAME in Table MBGXLA.
SIDFROM		0–1,023	SERVICE ID FROM. Enter the lower boundary of the service identifiers (SID) .
SIDTO		0–1,023	SERVICE ID TO. Enter the upper boundary of the service identifiers (SID).
RTEID		ROUTE ID.	TABNAME - IBNRTE (Enter IBNRTE or OFRT to indicate the table name to which translations will route.)
	TABNAME	IBNRRT2, IBNRT3, IBNRT4, IBNRTE, OFR2, OFR3, OFR4, OFRT, ITOPS	Table name. Enter the routing table name. If no route identifier is used, enter $.
INDEX		0–1,023	Index. Enter the index into the routing table.

SID route TRAVER example

When Table LTCALLS is datafilled with option SIDXLA, every call that arrives at the DMS switch with the specified call type avoids normal translations. The call is sent directly to a specified trunk. The DMS switch can only access normal translations when no SID or invalid SID is present. When a subscriber does not send a SID, Treat_No_SID defines what action is taken. When Y is selected, the call is sent to treatment. When N is selected, the translation continues using information from the NPI, NSF, XLARTE, and called digits. In some cases, a default SID that is not intended for SID routing, typically SID = 0, is transmitted. Nortel recommends that SID = 0 route to normal translations.

In the following TRAVER example, IBNRTE 7 directs the call to normal translations.

Figure 13-6 TRAVER Example

```
>traver tr pri14 n cdn e164 2222104 fx 4 b rtevfg all

TABLE TRKGRP

PRI14 PRA 0 NPDGP NCRT ASEQ N (ISDN 150) $ $

TABLE LTCALLS

ISDN 150 FX XLAIBN 300 PBXGROUP 0 0 (SIDXLA PRIFX Y Y N) $

TABLE CUSTSTN

TUPLE NOT FOUND

TABLE OFCVAR

AIN_OFFICE_TRIGGRP NIL

TABLE ISAXLA

PRIFX 4 4 (IBNRTE 505) $

TABLE IBNRTE

 505 ISA N N N SPRINTPRI PUB NONE N N 0

 . TABLE TRKGRP

 . SPRINTPRI IBNT2 0 NPDGP NCRT ISDN2 0 MIDL 0 N ANSDISC 0 Y N
N N N Y N 0 0 N 0

 .     0 0 N N N N N N N N N NATL (CALLCHR DIGDATA) (LTID ISDN
1018)

 .     (BCNAME 3_1KHZ) (SMDRITC ) $

 . TABLE LTCALLS

 . ISDN 1018 PUB XLALEC 10 $

EXIT TABLE IBNRTE

+++ TRAVER: SUCCESSFUL CALL TRACE +++



DIGIT TRANSLATION ROUTES

BC SPEECH
```

Figure 13-6 TRAVER Example

```
1 SPRINTPRI                   N CDN  E164  L  2222104 NIL_NSF


TREATMENT ROUTES.  TREATMENT IS: GNCT

1 120TONE
```

14 PRI Calling Line Identification

PRI Calling Line Identification ordering codes

Functional group ordering codes: NI000022

Functionality ordering codes: Not applicable

Release applicability

BCS36 and up

Description

Calling Line ID Incoming (CLID)- Table LTCALLS controls incoming CLID. The default allows presentation. Option CLID SUPPRESS suppresses presentation. This is shown in the Table LTCALLS example.

Calling Line ID Outgoing - Table LTDATA controls outgoing CLID. The default (ALWAYS) allows presentation, NEVER restricts presentation, and SCRENNED checks the far end PI (Presentation Indicator) to see if presentation is allowed. If the PI is set to allowed, the number is sent marked as Presentation Allowed. If the PI is set to restricted, the CLI Information is omited.

Datafilling Table LTDATA

The following table shows the datafill specific to PRI Calling Line Identification Blocking for Table LTDATA.

Table 14-1 Datafilling Table LTDATA (Sheet 1 of 2)

Field Name	Description	Setting
LTDKEY	Logical Terminal Group	LTGRP -Name of the PRI group of logical terminals.
	Logical Terminal Number	LTNUM - Enter a number to identify the logical terminal.
	Logical Terminal Data Type	DATATYPE - SERV (SERV for service related data.

Table 14-1 Datafilling Table LTDATA (Sheet 2 of 2)

Field Name	Description	Setting
LTDRST	Data Type	DATATYPE - SERV (SERV for service related data.
	Audible Treatments	AUDTRMT - N
	Calling Party Number Required	CGNREQD - Y - This field is populated, but is not used.
	Calling Party Number Delivery	CGNDELV - NEVER (NEVER indicates that the CGN information is not delivered to the PRI).
		ALWAYS - indicates that the CGN will always be delivered irrelevant of the presentation indication of the calling party.
		SCREENED - indicates that the CGN information will be screened (the CGN information element will be delivered, but the digits will only be included if the presentation indication of the number is allowed.)
	Called Party Number Delivery	CDNDELV - ALWAYS
		DFLTCGN - Enter the ten-digit directory nymber to be used as the default calling party number. The call defaults to a ten-digit CGN if it is not sent from PBX.

Datafill example for Table LTDATA

The following example shows sample datafill for Table LTDATA.

Figure 14-1 MAP display example for Table LTDATA

```
    LTDKEY                                      LTDRSLT
    _____

      ISDN   1002 SERV
    SERV Y N ALWAYS ALWAYS (TBO 899 N)$
```

Datafilling Table LTCALLS

Datafill example for Table LTCALLS

The following example shows sample datafill for Table LTCALLS

Figure 14-2 MAP display example for Table LTCALLS

```
LTID                      XLARTSEL
                                              OPTIONS
_____

ISDN  1008  PUB XLALEL 0        (INCLID SUPPRESS) $

ISDN  1009  PUB XLALEL 0                          $
```

15 PRI Network Name Delivery

Ordering codes

Functional group ordering code: NI000013

Functionality ordering code: not applicable

Release applicability

BCS36 and up

Description

The PRI Network Name Delivery capability is an NTNA PRI feature that delivers name information across a PRI network composed of DMS Family switches including Meridian-1 private branch exchanges (PBX). This capability also supports interworking with the CCS7 integrated services digital network user part (ISUP) network. With interworking, the intermediate node does the protocol conversion.

The DISPLAY information element (IE) uses SETUP or NOTIFY Q.931 messages to carry the called party name, calling party name, and response information across the PRI interface. The following are the operational parts of the capability:

* The retrieval of the calling party name (and that of the originally called party name, if redirection occurs) from the originating node. This information is transported across a network and delivered to the terminating node to be displayed on the terminating terminal.

* The retrieval of connected party name from the terminating switch. This information is transported across a network and delivered to the originating node to be displayed on the originating terminal.

* Call redirection can occur at the terminating node while the originally called party's name is not present in the call establishment message received from the originating node. In this case, the originally called party's name is retrieved from the terminating node's database, and transported in the outgoing call establishment message.

Operation

In Table NETNAMES, the subfield OPTION allows PRI Network Name Delivery. Subfield NMXCHG defines which method (SETUP or QUERY) to use to deliver the name across the PRI network.

In Table CUSTNTWK, the CLID entry in subfield OPTION determines if a line is allowed to display the connected party name for ONNEET and OFFNET calls, as defined in subfield CLIDOPT.

The actions at the originating exchange depend on the method of transfer. With the SETUP method, the called party name is included in the SETUP message. With the QUERY method, the availability of the calling party name is implied, and a request for connected party information is in the SETUP message. Refer to "Operation flow for PRI Network Name Delivery at the terminating exchange" in this document.

The actions at the terminating exchange depend on the method of transfer. With the SETUP method, when the terminating exchange receives the SETUP message (which contains the name information in the DISPLAY IE), the information is transferred to the connected party (if applicable) and the switch continues to complete the call setup. With the QUERY method, the terminating exchange determines if the connected party needs the name information and sends the request to the originating exchange using the NOTIFY message. The call continues without waiting for the name information from the originating exchange. Refer to "Operation flow for PRI Network Name Delivery at the terminating exchange" in this document.

The following shows the operation flow for PRI Network Name Delivery at the originating exchange.
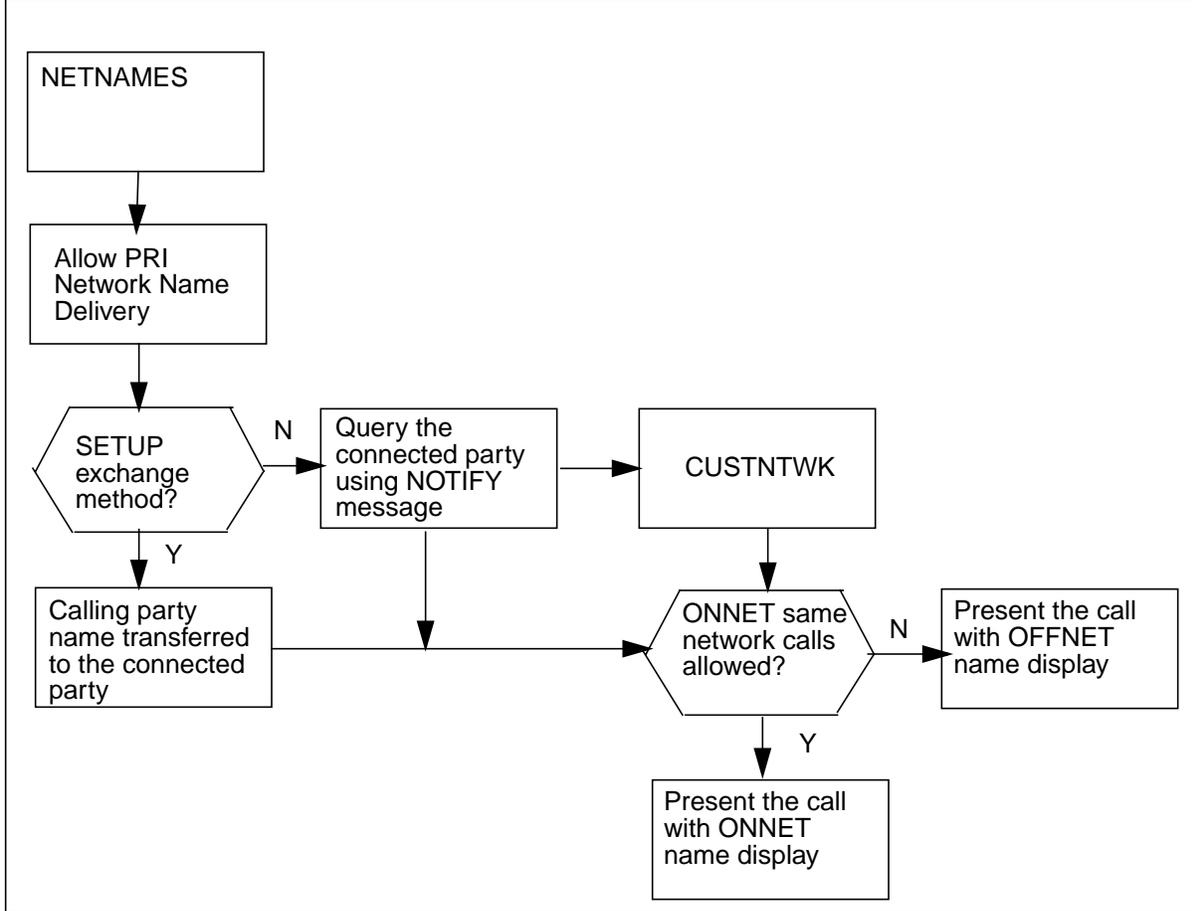
Figure 15-1 Operation flow for PRI Network Name Delivery at the originating exchange
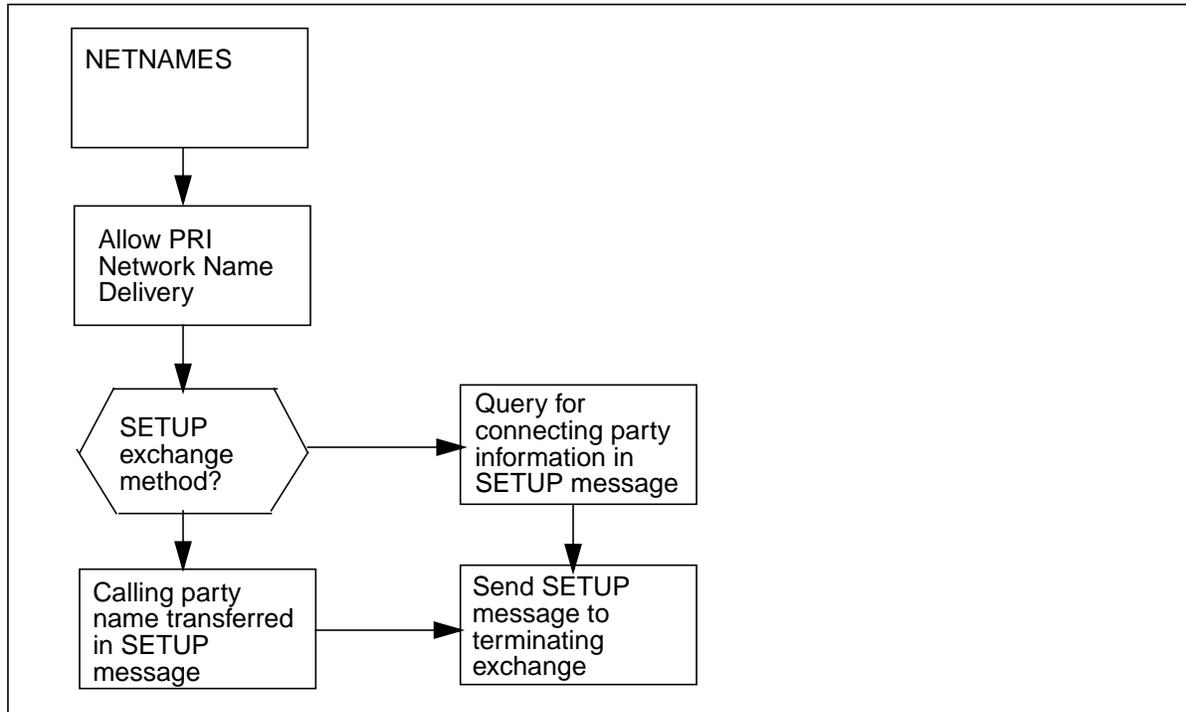
The following shows the operation flow for PRI Network Name Delivery at the terminating exchange.

Figure 15-2 Operation flow for PRI Network Name Delivery at the terminating exchange

Translations table flow

Datafill is required in Tables NETNAMES and CUSTNTWK.

Limitations and restrictions

The following limitations and restrictions apply to PRI Network Name Delivery.

- In multiple call forwarding situations, only the first redirected party name (or originally called party name) is displayed.

- For call forwarding using the QUERY transfer method, the name of the redirected party is not displayed when the first base stations are neither in the originating or terminating exchange.

- In some cases when the call configuration is modified after the call setup, the protocol control parameters are not exchanged (due to protocol limitations) and the name information is not transferred across the network.

Datafill sequence

The following table lists the tables that require datafill to implement PRI Network Name Delivery. The tables are listed in the order in which they are to be datafilled.

Table 15-1 Datafill tables required for PRI Network Name Delivery

Table	Purpose of table
NETNAMES	This table defines internal network names and their corresponding external network identifiers. The table assigns the capability to the logical network to which the end user belongs.
CUSTNTWK	This table associates an internal customer group name with a network name and calling in identification (CLID) used for the customer group throughout the network.

Datafilling Table NETNAMES

The following table shows the datafill specific to PRI Network Name Delivery for Table NETNAMES. Only those fields that directly apply to PRI Network Name Delivery are shown.

Table 15-2 Datafilling Table NETNAMES

Field	Subfield or refinement	Entry	Explanation and action
NETNAME		Alphanumeric (up to 32 characters)	Network name. Enter the name of the network to which the customer group belongs.
EXTNETID		Numeric (0–32,600)	External network identifier. Enter the unique number used to identify the network externally.
NETDIGS		Numeric (0–10)	Network digits. Enter the number of digits used to identify field EXTNETID.
NETOPTS		See subfields	Network options. This field consists of subfields OPTION and NMXCHG.
	OPTION	NMDSP	Option. Enter NMDSP for network name display. Enter $ to end the tuple.
	NMXCHG	SETUP, QUERY	Name exchange method. Enter SETUP to transfer the name information in the SETUP message. Enter QUERY to check if the name is to be presented at the destination.

Datafill example for able NETNAMES

The following example shows sample datafill for Table NETNAMES.

Figure 15-3 MAP display example for Table NETNAMES

```
 NETNAME EXTNETID NETDIGS
                                        NETOPTS
 _____

 CUSTNET1         2         7
                                    (NMDSP QUERY) $
```

Datafilling Table CUSTNTWK

The following table shows the datafill specific to Table CUSTNTWK. Only those fields that apply directly to PRI Network Name Delivery shown.

Table 15-3 Datafilling Table CUSTNTWK (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CUSTNAME		Alphanumeric (up to 16 characters)	Customer name. Enter the internal name of the customer group. *Note:* The customer group must be datafilled in Table CUSTHEAD first.
NETNAME		Alphanumeric (up to 32 characters)	Network names. Enter the internal name of the network assigned in field NETNAME in Table NETNAMES.
NETCGID		Numeric (0–4096)	Network customer group identifier. Enter the number used to identify the customer group throughout the network.
OPTIONS		See subfields	Options. This field consists of subfields OPTION and CLIDOPT.

Table 15-3 Datafilling Table CUSTNTWK (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	OPTION	CLID	Option. Enter CLID to indicate calling line identification. Enter $ to end the tuple. *Note:* To display the network name, this value must be assigned to the customer group of the party equipped with a display agent. To display the network name at the telephone, Table CUSTSTN must be datafilled to indicate that a customer supports the capability. Table DNATTRS or Table DNGRPS must be datafilled to add the name associated with a directory number.
	CLIDOPT	ONNET, OFFNET	Calling line identification option. Enter ONNET to enable Network Name Display for calls that originate and terminate in the same network. Enter OFFNET to enable Network Name Display for calls across different networks.

Datafill example for Table CUSTNTWK

The following example shows sample datafill for able CUSTNTWK.

Figure 15-4 MAP display example for Table CUSTNTWK

```
  CUSTNAME          NETNAME         NETCGID

                                              DNREVXLA
                                              OPTIONS
  _____

  GRP1              CUSTNET1        311
                                                   $
                                        (CLID ONNET) $
```

16 PRI Network Ring Again

Ordering code

Functionality group ordering code: NI000013

Functionality ordering code: Not applicable

Release applicability

BCS36 and up

Prerequisites

To operate, PRI Network Ring Again (NRAG) requires the NI000011 functional group.

Description

The PRI Network Ring Again capability allows the Ring Again feature to work when the calling and called parties are on different switches connected by PRI trunks or by a combination of PRI and Common Channel Signaling 7 (CCS7) links. An end user located in any of the switching nodes in the combined PRI/CCS7 network can apply NRAG against a busy station located in any of the nodes in the same network and customer group.

This feature allows an end user who calls a busy station to queue against that station and be recalled when it becomes idle. When the end user accepts the recall, the original call is automatically set up again.

NRAG is implemented through messages that are passed back and forth between the originating and terminating switch. There can be intermediate switches between the originator and terminator. All switches must be connected by either PRI or CCS7. The party who activates NRAG is at the originating switch. The party who is busy is at the terminating switch. The NRAG messages are passed (interworked) from one switch to another using the message routing Table MSGRTE. The messages contain the transaction capability application part (TCAP) information required by NRAG. The following figure illustrates how TCAP messages are routed over a PRI/CCS7 network using NRAG.

Figure 16-1 Routing TCAP messages thorough Table MSGRTE
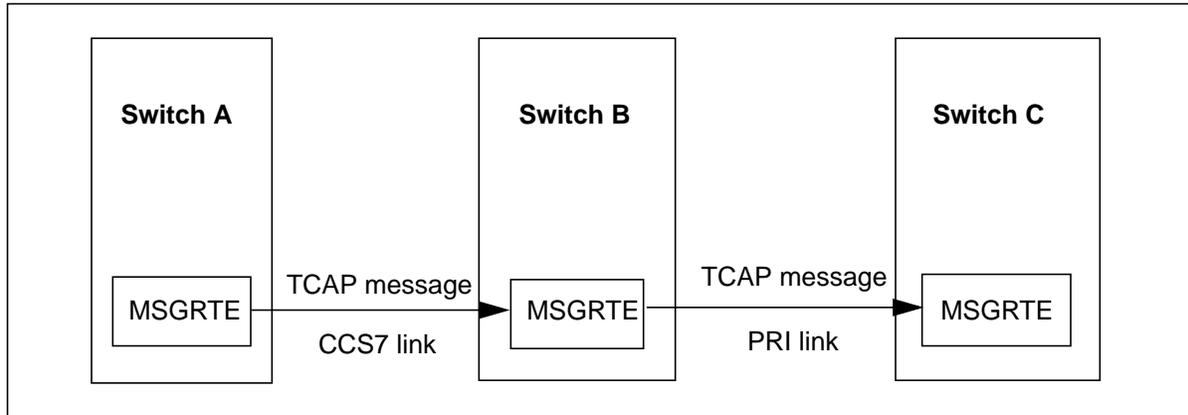
Operation

Table NETNAMES is used to define the name of the logical network to which the end user belongs. The datafill for each network must be consistent on all switches involved. If routing trough Table MSGRTE is not chosen, the TCAP messages are routed through the signaling connection control part (SCCP) NRAG subsystem.

NRAG does not require a value in subfield OPTION in Table NETNAMES to cause the TCAP messages to route through Table MSGRTE. The options NINTNRAG and NMRTNRAG are required to prevent NRAG messages from being sent through Table MSGRTE.

Table CUSTNTWK is used to associate the customer group with its logical networks and to specify NRAG.

Table MSGRTE determines where a message is routed. The table is concerned with routing messages and not with establishing call connections. All switches in the path must have appropriate datafill in Table MSGRTE.

Table MSGRTE must be datafilled for NRAG to function. The table is indexed by a three-subfield key consisting of a network identifier (NETID) and two, digit subfields (FROM DIGS and TODIGS). The data in the table is a list of routes made up of one to four route elements. Each route element in the route list requires a LOCAL, PRA, or SS7 route selector. When the selector is PRA, a PRI facility message is created and sent to the PRI facility process in the next switch. When the selector is SS7, an SCCP unit data message is created and sent to the SCCP interwork system in the switch. These messages contain the TCAP information needed by NRAG. The NRAG capability also uses Table MSGRTE. The following figure illustrates the NRAG routing process using Table MSGRTE.

Figure 16-2 MWI routing using Table MSGRTE
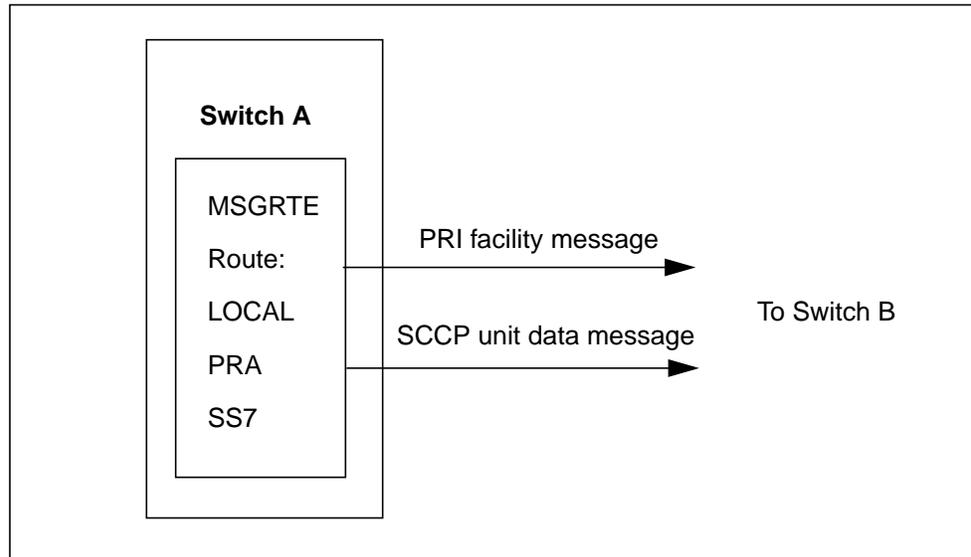
Limitations and restrictions

The following limitations and restrictions apply to PRI Network Ring Again:

- The original call must be entirely over PRI and/or SS7 trunks. NRAG is disallowed if any per trunk signaling (PTS) trunk is encountered.

- Subfield CALLTYPE in Table LTCALLS must be either PVT or TIE for the logical terminal identifier (LTID).

- Tables DNATTRS and DNGRPS may alter the digits in the orientation information element (IE). When either table has an entry for the calling directory number (DN) and network, and the ADDRESS option is datafilled with alternate address digits, these digits are sent in the origination IE. Table MSGRTE must be datafilled accordingly at the destination switch with the alternate digits.

- The calling and the called party must be members of the same network customer group. That is, the parties must belong to customer groups that have the same network customer group identifier infield NETCGID in Table CUSTNTWK. The actual names of the customer groups need not be the same at each switch.

- NRAG does not work between two switches that have different options datafilled in Table NETNAMES.

- Field NETNAME datafilled in each switch does not have to be the same. However, field EXTNETID must be the same at each switch. The EXTNETID entry is the external network identifier that is passed from switch to switch for NRAG. The DMS-100 switch converts the external

identifier to a network name at each switch and uses the network name to access Table MSGRTE.

- In order for NRAG to interwork between PRI and CCS7, the CCS7 SCCP tables must have additional datafill. Use the new subsystem (SS) name INTERWRK and the new global title (GT) name PRAGT. Also, Table TCAPTRID must have NRAG datafilled in the TCAP application field (TCAPAPPL).

Datafill sequence

The following table lists the tables that require datafill to implement PRI Network Ring Again. The tables are listed in the order in which they are to be datafilled.

Table 16-1 Datafill tables required for PRI Network Ring Again

Table	Purpose of table
NETNAMES	Defines the internal network names and their corresponding external network identifiers. Assigns the capability to the logical network to which the end user belongs.
CUSTNTWK	Associates an internal customer group name with a network name and calling line identification (CLID) used for the customer group throughout the network.
MSGRTE	Defines the routing of messages between switches.

Datafilling Table NETNAMES

The following table shows the datafill specific to PRI Network Ring Again for Table NETNAMES. Defines the internal network names and their corresponding external network identifiers. Assigns the capability to the logical network to which the end user belongs. Only those fields that apply directly to PRI NRAG are shown.

Table 16-2 Datafilling Table NETNAMES (Sheet 1 of 2)

Field	Subfield	Entry	Explanation and action
NETNAMES		Alphanumeric (up to 32 characters)	Network name. Enter the name of the network to which the customer group belongs.
EXTNETID		Numeric (0-32, 767)	External network identifier. Enter the unique number used to identify the network externally.
NETDIGS		Numeric (0-10)	Network digits. Enter the number of digits used to identify field EXTNETID.

Table 16-2 Datafilling Table NETNAMES (Sheet 2 of 2)

Field	Subfield	Entry	Explanation and action
NETOPTS		See subfield	Network options. This field consists of subfield OPTION.
	OPTION	FACREJ, NINTNRAG, NMRTNRAG	Option. Enter FACREJ for facility reject. The facility reject message is sent to the originator when the facility message cannot be routed for some reason.
			Enter NINTNRAG for no interworking NRAG. The network send its NRAG connectionless SS7 message to the feature specified by the TCAP application field (TCAPAPPL) in Table TCAPTRID.
			Enter NMRTNRAG for no message route NRAG. The network routes its NRAG connectionless SS7 message by the digits and point codes returned in the ISDN user part (ISUP) RELEASE message instead of using Table MSGRTE.
			Enter a $ to end the tuple.
			Note: Options NINTNRAG and NMRTNRAG only apply to NRAG when the original call is made over an SS7 trunk. Both options are datafilled together for a NETNAME. If both options are datafilled, Table MSGRTE is not accessed during routing.
			When NINTNRAG is not datafilled, the network uses the INTERWRK RCAP application. Option NINTNRAG can only be datafilled for a network when MNRTNRAG is datafilled.
			Not datafilling NMRTNRAG or having a pure PRI network causes the NRAG messages to be routed by Table MSGRTE.

Datafill example for Table NETNAMES

The following example shows sample datafill for Table NETNAMES.

Figure 16-3 MAP display example for Table NETNAMES

```
    NETNAME   EXTNETID   NETDIGS
                                                      NETOPTS
    _____

    CUSTNET1     1024         7
                                        ( NMSTBRTE) $
```

Datafilling Table CUSTNTWK

The following table shows the datafill specific to PRI Network Ring Again for Table CUSTNTWK. Associates an internal customer group name with a network name and calling line identification (CLID) used for the customer group throughout the network. Only those fields that apply directly to PRI NRAG are shown. For a description of the other fields, refer to the data schema section of this document.

Table 16-3 Datafilling Table CUSTNTWK (Sheet 1 of 2)

Field	Subfield	Entry	Explanation or action
CUSTNAME		Alphanumeric (up to 16 characters)	Customer name. Enter the internal name of the customer group. ***Note:*** The customer group must be datafilled in Table CUSTHEAD first.
NETNAME		Alphanumeric (up to 32 characters)	Network name. Enter the internal name of the network assigned in field NETNAME in Table NETNAMES.
NETCGID		Numeric (0-4096)	Network customer group identifier. Enter the number used to identify the customer group throughout the network.
OPTIONS		See subfield	Options. This field consists of subfield OPTION and refinements.
	OPTION	NTWKRAG	Option. Enter NTWKRAG for NRAG. Enter a $ to end the tuple.
	TIMEOUT	Numeric (10-60)	Time-out. Enter the number of seconds of ringing desired to alert the calling party that the called party is now idle.
	ORIGDUR	Numeric (5-30)	Originator during time-out. Enter the number of minutes that the NRAG request at the originating switch is to remain active.

Table 16-3 Datafilling Table CUSTNTWK (Sheet 2 of 2)

Field	Subfield	Entry	Explanation or action
	ORIGRTY	Numeric (2-10)	Originator retry time-out. Enter the number of seconds that the originator waits after sending out a TCAP QUERY message before sending out another message or ending.
	TERMDUR	Numeric (5-31)	Terminator duration time-out. Enter the number of minutes that the NRAG request at the terminating switch must remain active. *Note:* This time-out value must be greater than the entry in subfield ORIGDUR.
	TERMGRD	Numeric (1-6)	Terminator guard time-out. Enter the number of seconds that the terminator must wait after the receiver goes on hook before sending a message to the originator to indicate idleness.
	TERMQAD	Numeric (5-40)	Terminator queue advance time-out. Enter the number of seconds that the terminator switch must wait before sending out called party free messages to different originators.
	NETOPT	ONNET or OFFNET	Network option. Enter ONNET to enable NRAG for calls that originate and terminate in the same network Enter OFFNET to enable NRAG for calls across different networks.

Datafill example for Table CUSTNTWK

The following example shows sample datafill for Table CUSTNTWK.

Figure 16-4 MAP display example for Table CUSTNTWK

```
   CUSTNAME     NETNAME    NETCGID
                                              DNREVXLA
                                              OPTIONS

      FRP1     CUSTNET1    311
                                                 $
                      (NTWKRAG  10 5  2  5 1  5  ONNET)$
```

Datafilling Table MSGRTE

The following table shows the datafill specific to PRI Network Ring Again for Table MSGRTE. It defines the routing of messages between switches. Only those fields that apply directly to PRI NRAG are shown. For a description of the other fields, refer to the data schema section of this document.

Table 16-4 Datafilling Table MSGRTE (Sheet 1 of 2)

Field	Subfield	Entry	Explanation or action
MSGRTEKEY		See subfields	Message route key. Datafill subfields NETID, FROMDIGS, and TODIGS as one concatenated entry. Separate the three values with blanks. You are not prompted for the subfields individually.
	NETID	Alphanumeric (up to 32 characters)	Network identification. Enter the network name to which the customer group belongs.
	DIGRANGE	See subfields	Digit range. This is made up of subfields FROMDIGS and TODIGS.
	FROMDIGS	Up to 11	From digits. Enter a digit string for the lower bound of the digit range to which the route list applies.
	TODIGS	Up to 11	To digits. Enter a digit string for the upper bound of the digit range to which the route list applies.
MSGRTRES		See subfields	Message routes
	MSGRTSEL	LOCAL, PRA, SS7	Message route selector. Enter LOCAL from the message to terminate locally at the DMS-100 switching node. Enter PRA for the message to route over a D-channel on a PRI trunk to the next node. Enter SS7 for the message to route over a CCS7 trunk to the next node. Enter a $ to end the tuple. *Note:* LOCAL must be the first and only route in a tuple. There can only be one SS7 selector and it must be the last selector in a tuple.
	TRKCLLI	Alphanumeric (1 to 16 characters)	Trunk CLLI. Enter the trunk calling line identifier. *Note:* Use when field MSGRTSEL is PRA.

Table 16-4 Datafilling Table MSGRTE (Sheet 2 of 2)

Field	Subfield	Entry	Explanation or action
	DPC	Numeric	Destination point code. Enter the valid point code of the switch that the message is to be sent to.
			Note: Use when field MSGRTSEL is SS7.
	DELDIGS	Numeric (0-15)	Delete digits. Enter a number to specify the digits to delete from the destination address in the message routing information.
	PREDIGS	Up to 11	Prefix digits. Enter the digit string to prefix the destination address in the message routing information.
MSGRTRES	OPTION	NEWNET	Option. Enter NEWNET for new network name. Enter a $ to end this subfield.
			Use when subfield MSGRTSEL is PRA or SS7. For SS7, use NEWNET only.
			Note: This subfield is optional.
	NETNAME	alphanumeric (up to 32 characters)	Network name. Enter the new network name that is to be used to replace the network identifier in the destination address in the message routing information.
			Note: The network name must already exist in Table NETNAMES.

Datafill example for Table MSGRTE

The following example shows sample datafill for Table MSGRTE.

Figure 16-5 MAP display example for Table MSGRTE

```
   MSGRTKEY
                                              MSGRTRES

   _____

   CUSTNET1   0000001   9999999
              ( PRA    CTOD     0    0 (NEWNET CUST1PVT)$)$
```

17 PRI Release Line Trunk

Release Line trunk

The Release Line Trunk (RLT) feature is provided on NTNA PRI trunks for DMS-100. RLT optimizes the usage of PRI trunks by providing the CPE the ability to release calls that loop through and back out of the CPE. A typical example would be an operator off of a PBX who forwards calls out of the PBX. Figure 17-1 shows a typical usage for RLT.

Figure 17-1 Typical usage of RLT
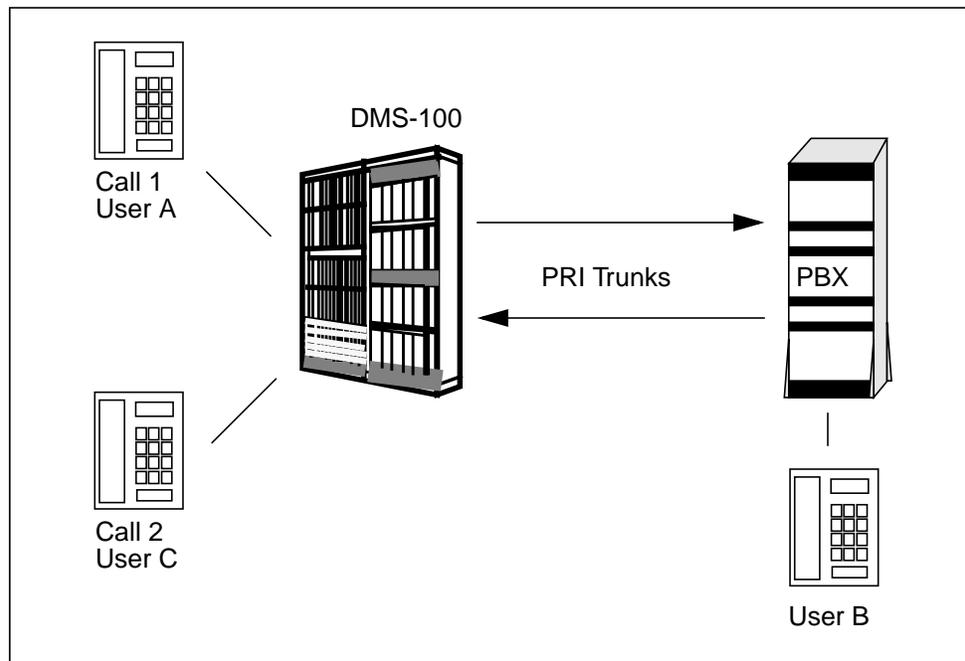
In the scenario in the figure, user A calls user B through the PBX. This call is referred to as call 1. User B then forwards or transfers the call to user C, requesting RLT. This call (call 2) is routed through the same DMS-100. Note that calls 1 and 2 can be on the same trunk or different trunk groups.

When the call (call 2) connects to user C, RLT is invoked. In this instance, the call is bridged at the DMS-100 and the PRI trunks to the PBX are released. The figure below shows the results of successfully invoking RLT.

Figure 17-2 Results of invoking RLT
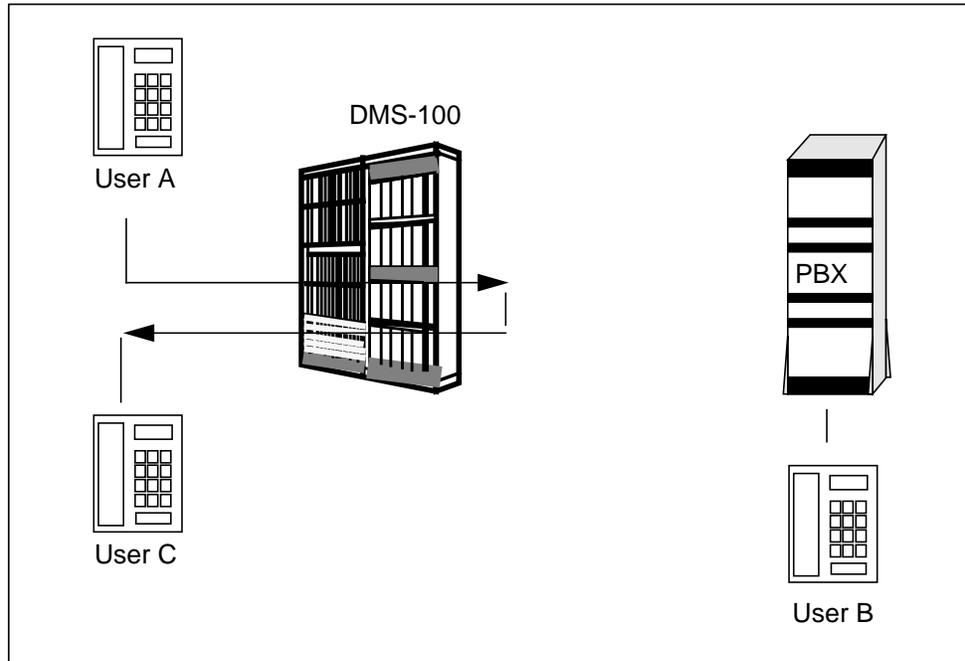
In the RLT protocol, the user side (the PBX) requests the RLT. The network side (the DMS-100) bridges the call and releases the PRI trunks.

 If the B-channels are on different PRI trunk groups, they must connect to the same DMS-100 and PBX.

Call billing occurs as if RLT was never invoked.

If RLT is not enabled for this customer or the CPE's invoke message is invalid, the call continues as if RLT was never invoked.

Enabling the RLT Option

The RLT feature is added to a PRI in Table TRKGRP.

Figure 17-3 Sample RLT entry in Table TRKGRP

```
TABLE: TRKGRP

>pos 64K1DT0

64K1DT0
PRA 0 PRAC NCRT ASEQ N (ISDN 3) (MRLT) $
```

Interactions

RLT feature interactions with both AIN 0.1 and AIN 0.2 are not supported. However, RLT feature interactions with Local Number Portability (LNP) are supported.

18 PRI with Semipermanent Packet

Ordering codes

Functional group ordering code: NI000034

Functionality ordering code: NI000034

Release applicability

NA011 and up

PRI with Semipermanent Packet was introduced in NA011.

Description

The PRI with Semipermanent Packet (Provisioning and Query Tools) feature provides X.25 primary rate B-channel packet services to meet National ISDN-2 requirements. This feature allows operating company personnel to assign a B-channel on the PRI T1 link from the customer premises equipment (CPE) to the packet handler. This feature specifies the capabilities to support a semipermanent (nailed up) X.25 packet connection on PRI. The existing X.25 services on basic rate interface (BRI) are available on PRI.

Operation

This feature addresses the requirements of those individuals who work from home and need their computers continuously connected to the packet network. The following changes occur in the provisioning and query tools to allow continuous connectivity.

The DS1 channels that carry X.25 packet services are defined as trunks for identification and maintenance purposes. The DS1 channels that carry X.25 packet services are viewed as lines for routing and translation purposes. PRI packet services has a seperate LTID, DN, and CLLI. The packet PRI trunks are similar to X.75 trunk in terms of internal connectivity.

The following diagram shows the tables that datafill for PRI with Semipermanent Packet.

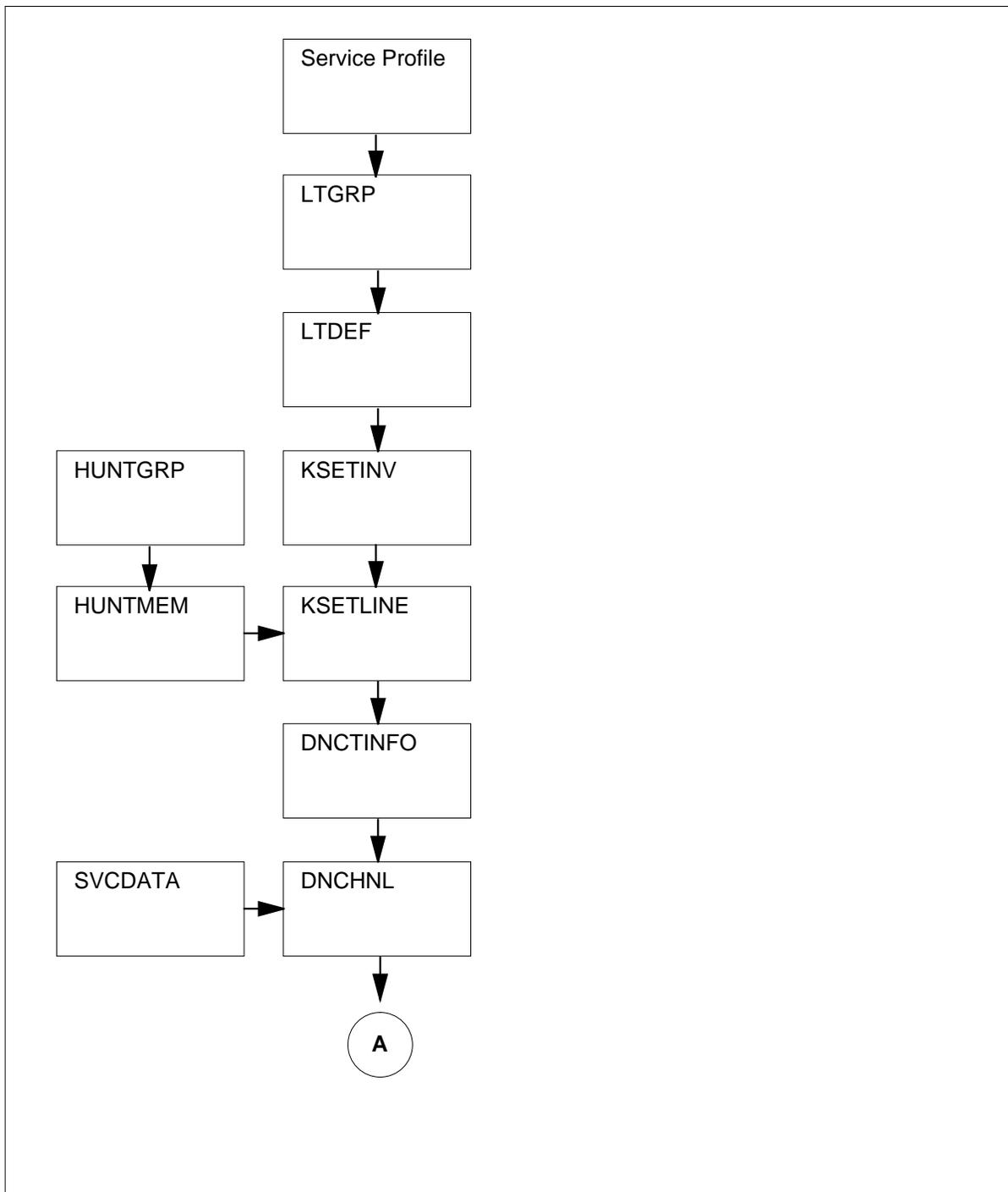**Figure 18-1 Table flow for PRI with Semipermanent Packet**

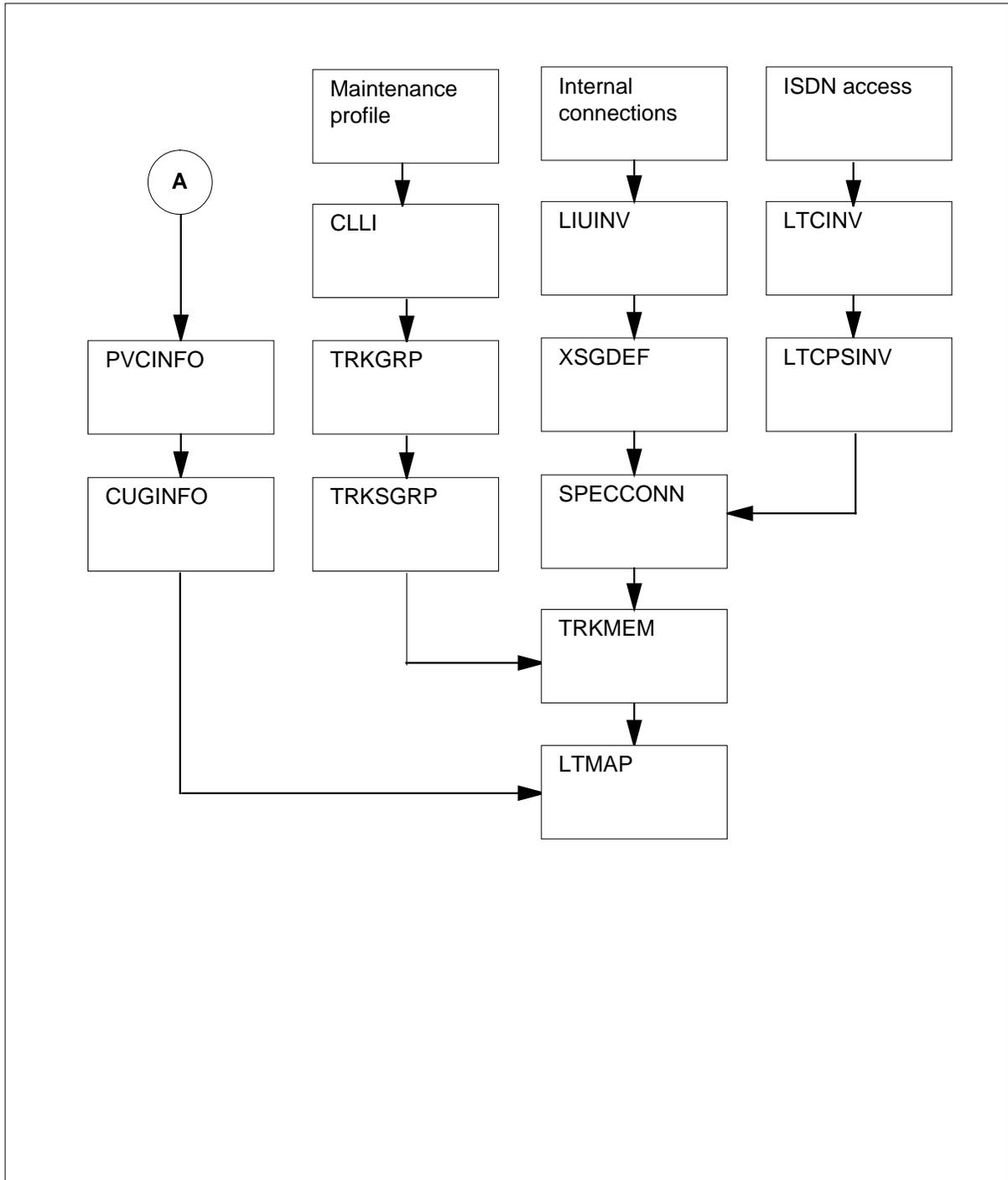**Figure 18-2 Table flow for PRI with Semipermanent Packet (continued)**

Table 18-1 DATAFILLL EXAMPLE OF PRI with Semipermanent Packet

Datafill table	Example data
LTGRP	PRAPKT 8 (SAPI16) $
LTDEF	PRAPKT 1 PB BRAFS $
KSETINV	PRAPKT 1 ISDNKSET 12 $
KSETLINE	PRAPKT 1 1 DN N 5551001 LONS634 0 0 613 $ BRI PMD
DNCTINFO	6135551001 PMD PMD (NUI N) (FSA N) (RCA N) (ICS N) (CUGS N) (TCN N) (FCPN N) (OCB N) (LCP N) (RPOAB N) $
DNCHNL	6135551001 B B (LLFSQ MOD8) (LLWS 7) 9T1 20) 9T2 2) (T3 5) (N2 3) (LCA (SLCN 1) (NPVC 0) (NOWI 0) (NNRC 1) (NOWO 0) $) (PLSQ MOD8) (NDWS N) (NDPS N) (DTCA N) $
XSGDEF	100 MS 21 0 1 30 Y
SPECCONN	XSGCHNL 100 (9) $ DS1 LTC 0 6 23 CON ACTIVE
CLLI	PKTPRI 56 5 Packet_on_PRI_CLLI
TRKGRP	PKTPRI PRA 0 PRAC NCRT ASEQ N $ $
TRKSGRP	PKTPRI 0 DS1SIG X25
TRKMEM	PKTPRI 1 0 LTC 0 623
LTMAP	PRAPKT 1 CLLIPKTPRI (MEM 1) $

Query tools
The QPHF and QLT modified commands query LT, DNs, and Line Eq for this feature on PRI.

QPHF
Use the non-menu QPHF (query packet handler function) command to display provisioning information about DNs, channels, and links. The following additional information displays with the QPHF commands:

- The QPHF LTID command shows that the LT is on an X.25 B link and is assigned to a PRI B-channel. The CLLI and MEMBER also display.
- The QPHF XSG command shows that the channel on the XSG is a PRI channel with X.25 service.
- The QPHF CHNL command shows that the channel type is PRI.

- The QPHF CLLI command shows a DN instead of a CLLI and MEMBER. The display also shows X.25 PRI for the channel type and X.25 B for the link type.

- The QPHF DN command shows X.25 PRI for the channel type.

QLT

Use the non-menu QLT (query logical terminal) command to display information about an LTID. This feature on PRI includes the following information:

- all DNs assigned to the keys on an LTID

- access privileges and the LTCLASS of the LTID

- DS0 endpoint Notice that the DS0 endpoint displays for PRI instead of a LEN, which displays for BRI.

Limitations and restrictions

The following paragraphs describe the interactions between PRI with Semipermanent Packet (Provisioning and Query Tools) and other functionalities.

- The feature does not support the SERVORD SLT ATT and SLT DFT commands.

- This feature on PRI works only on ISDN DTCI and LTCI.

Interactions

The following paragraphs describe the interactions between PRI with Semipermanent Packet (Provisioning and Query Tools) and other functionalities.

- This feature can share a DN with BRI VI and CMD. PKT BRI and PKT PRI can reside in the same hunt group.

Datafilling Table TRKMEM

The datafill for Table TRKMEM does not change with the PRI with Semipermanent Packet feature.

Error messages for Table TRKMEM

The following error messages apply to Table TRKMEM.

Table 18-2 Error message for Table TRKMEM

Error message	Explanation and action
DS0 must be nailed up in SPECCONN for X25 PRA	While Tables CLLI, TRKGRP, and TRKSGRP datafill, Table SPECCONN does not datafill. When Table TRKMEM datafills, Table TRKMEM searches for a DS0 connection on Table SPECCONN. If the DS0 connection is absent on Table SPECCONN, this error message displays.
	Datafill Table SPECCONN before Table TRKMEM.
Delete the LTMAP entry first	All the tables datafill for PKTPRI. This error message displays when operating company personnel try to change or delete a tuple in Table TRKMEM.
	Delete the tuple in Table LTMAP, then try to change the tuple in Table TRKMEM for the corresponding DS0.
Cannot use time slot 24 on DS1 for Packet on PRI	Timeslot 24 is reserved for the D-channel for the ISDN PRI trunk. This error message displays if the operating company personnel try to use timeslot 24.
	Use a timeslot other than 24 in Table TRKMEM.

Datafilling Table LTMAP

The following table shows the datafill specific to PRI with Semipermanent Packet for Table LTMAP. Only those fields that apply directly to PRI with Semipermanent Packet are shown.

Table 18-3 Datafilling Table LTMAP

Field	Subfield	Entry	Explanation and action
OPTION		MEM (values 0-19)	Member number. This option prompts operating company personnel to enter the member number of the trunk group. Option MEM specifies that the LTID is a packet on PRI LTID. (MEM is only valid for packet on PRI.)

Datafill example for Table LTMAP

The following example shows sample datafill for Table LTMAP.

Figure 18-3 MAP display example for Table LTMAP

```
OPTION
---------------------------------------------------
PRAPKT 1 CLLI PKTPRI (MEM1)$
```

Translation verification tools

PRI with Semipermanent Packet does not use translation verification tools.

SERVORD

PRI with Semipermanent Packet does not use SERVORD.

Directories and commands

The following table shows the modified directories that support PRI with Semipermanent Packet. The table also shows the modified commands that support this feature. Access these directories using commands at the CI level.

Table 18-4 Directories and modified commands required for PRI with Semipermanent Packet (Sheet 1 of 2)

Directory	Command
PROGDIR	QLT
	The QLT command displays all the information for an LTID. All of this information also displays for PRI with Semipermanent Packet with one exception: the DS0 endpoint displays instead of the LEN.
DMSCI	QPHF
	The QPHF command displays the provisioning information on all objects (DNs, channels, links) involved in the service for PRI with Semipermanent Packet.
	QPHF LTID
	The QPHF LTID command displays all the information for an LTID. The display shows that the logical terminal (LT) is on an X.25 B link type and is assigned to a PRI B-channel. The CLLI and MEMBER information also display.
	QPHF XSG
	The QPHF XSG command displays all the information for an XSG. The display shows that a channel on the XSG is a PRI channel with X.25 service by displaying channel type X.25.

Table 18-4 Directories and modified commands required for PRI with Semipermanent Packet (Sheet 2 of 2)

Directory	Command
	QPHF CHNL The QPHF CHNL command displays all the information for a channel with one exception: the display shows that the channel type is PRI. QPHF CLLI The QPHF CLLI command displays all the link information (CLLI and MEMBER) with one exception: the display shows a directory number instead of a CLLI and MEMBER. The display also shows X.25 PRI as the channel type and X.25 B as the link type. QPHF DN The QPHF DN command displays all the information for a directory number with one exception: the display shows X.25 PRI as the channel type. QPHF X75 If the operating company personnel enter an X.25 PRI CLLI using the QPHF X75 command, the following error message displays: This is a PRI CLLI. Use QPHF CLLI.

Part VIII
Maintenance

Part VIII: "Maintenance" contains the chapter, "Maintenance."

19 Maintenance

ISDN is a layered protocol. Layer 1 is the physical T1 span. It carries the messages. Layer 2 is the messaging D-channel. It has a structured format for delivery. Layer 3 is the actual messages. For example, if we consider the postal system, the mail carrier is layer 1, the envelope is layer 2, and the letter is layer 3. We can perform maintenance on Layers 1 and 2. The following will describe the maintenance commands initiated from a Maintenance Access Position (MAP), Operation Measurements (OMs), also referred to as pegs, and associated logs. This guide is an abbreviated version that addresses most simple issues. For an exhaustive maintenance guide refer to NTP 297-2401-502.

To bring the ISDN PRI trunk into service, first bring the carrier into service, (Layer 1), then bring the D-channel into service (Layer 2), and then the B-channels into service.

Once a PRI trunk group has been placed into service, it typically runs trouble-free. Beyond initially bringing the groups into service, there is no need to access the maintenance screens described below. Any fault recovery is done automatically. The OMs will only be used when troubleshooting a problem. The logs will be used to point out potential trouble.

Carrier Maintenance

To access from a MAP position:

- >MAPCI;MTC;TRKS; CARRIER

- >POST DTCI 0

Figure 24-1 Carrier Maintenance Access Position (MAP) Display

```
CM        MS      IOD       NET      LNS     TRKS       EXT        APPL


POST   CLASS      ML       OS    ALRM   SYS13      MAN13       UNEQ    OFFL
0 QUIT   TRUNKS    0        0       0        0           0           0       0
2 POST   REMOTE    0        0       0        0           0           0       0
3        TIMING    0       .0       0        0           0           0       0
4          DS1
5 LOOP N CLASS SITE DTCI CK D ALRM SLIP FRME BER ES SES STATE
6 TST      0 TRUNKS HOST 0  0 C              0       0    <7    0   0    INSV
7 BSY
8 RTS
9 OFFL
10 DispOpt
11 Disp    SIZE OF POSTED SET --1
12 Next    TRKS:
13         CARRIER:
14 Detail  POST:
15
16
17
18
   LAP2046
Time 08:58 >
```

The Carrier is Layer 1, the physical layer. The thresholds set in Table CARRMTC are listed and updated continuously on this screen and are pegged in the CARRIER OMs shown below. During normal use these pegs should be clear, as shown.

Table 24-1 Description of Carrier Maintenance Commands

Command	Results
7 or Busy	Manually busy the span or take it out of service
8 or RTS	Return the span To Service.
9 or Offl	Off-line the span. The system will not send alarms.

Table 24-2 Description of Carrier Maintenance States

States		
OFFL	Off-Line	This is how the span will come up on installation.
MANB	Manually Busy	An operator has BSY the space.
INSV	In Service	Normal operation.
SYSB	System Busy	The DMS recognizes it as non-operational.
CSBY	C-Side Busy	The peripheral C-Side links are busy.

Table 24-3 Description of Normal Carrier Maintenance Actions

Carrier	Action	Result
OFFL	7 or Busy	MB
MB	8 or RTS	INSV
SYSB	7 or Busy	MB

Carrier Operational Measurements

To access from a MAP position:

- >OMSHOW DS1CARR ACTIVE 'HOST DTCI 0 10 C
- >OMSHOW DS1CARR ACTIVE 18
- >OMSHOW DS1CARR HOLDING 'HOST DTCI 0 10 C
- >OMSHOW DS1CARR HOLDING 18

The active register is the currently updating register and the holding register is the last 15 minutes. The span can be accessed from the index number or the span location as shown.

Figure 24-2 DS1CARR Operational Measurements (MAP) Display

```
DS1CARR


                    DS1LCGA        DS1RCGA        DS1LOF         DS1SLP

                     DS1SBU         DS1MBU        DS1PBU         DS1CBU

                     DS1BER         DS1ES         DSISES         DS1UAS

                     DS1AIS         DS1ECF

 18 HOST DTCI 0       10 C

                        0              0              0              0

                        0              0              0              0

                        0              0              0              0

                        0              0
```

Table 24-4 Description of DS1CARR OM Registers

Register	Explanation
DS1AIS	DS1 Alarm Indication Signal: PM has received an alarm
DS1BER	DS1 Bit Error Rate: (C)
DS1CBU	DS1 C-Side Busy Usage: 100 second scan interval

Table 24-4 Description of DS1CARR OM Registers

Register	Explanation
DS1ECF	DS1 Echo Canceller Failure: 10 minute audit interval
DS1ES	DS1 Error Seconds: (C) (U)
DS1LCGA	DS1 Local Carrier Group Alarm: Received framing lost for 2.5 sec.
DS1LOF	DS1 Loss Of Frame: incoming LOS in 10 minute intervals
DS1MBU	DS1 Manual Busy Usage: 100 second scan interval
DS1PBU	DS1 Peripheral Busy Usage: 100 second scan interval
DS1RCGA	DS1 Remote Carrier Group Alarm: Far end is not receiving signal
DS1SBU	DS1 System Busy Usage
DS1SES	DS1 Severe Error Seconds (C) (U)
DS1SLP	DS1 Frame Slips (U)
DS1UAS	DS1 Unavailable Seconds (U) Unavailable for any reason

Carrier Troubleshooting

Verify that the physical connection exists. The physical connection may be as simple as a copper wire running between a CO patch panel and a device in the same building. On the other hand, the physical connection may be as complex as originating on an OC3, run through a digital cross connect, OC192, repeaters, and drop insert to custom equipment. In either case there is a physical path for a clear channel DS1 that can be traced from the DMS to the CPE.

Verify that the transmit pair is connected to the receive pair. The DS1 is a four-wire circuit, two wires for transmit and two wires for receive. In many cases the pairs can be flipped, which may be the case if the physical connection exists. If so, simply flip the pairs at the most convenient location.

Verify that the frame format is correct. Even with a correct connection, the carrier may still be SYSB because the frame format is incorrect. Ensure that the frame format is ESF. Refer to Table CARRMTC for an XPM or Table MNHSCARR for a SPM.

Verify that the DS1 facility is error free. A BERT (Bit Error Rate Test) is usually run during installation to determine the integrity of the facility. The DS1CARR OM provides ongoing statistics on facility integrity. All OMs should read "0", indicating there are no errors.

Once the carrier is INSV, the DMS will automatically bring it back into service if communication is lost. Instances where a carrier has been SYSB for some time may require MB and RTS to bring it back into service.

D-channel Maintenance

To access from a MAP position:

- >MAPCI;MTC;TRKS;TTP;PRADCH

- >POST GD PRATEST3 (Post Trunk-Group D-channel for PRATEST3)

Figure 24-3 PRADCH MAP Display

```
_CM       MS          IOD         NET        LNS       TRKS      EXT         APPL

PRADCH

0 QUIT    POST                    DELQ                            BUSYQL               DIG
2 POST    TTP                     6-030
3         CKT TYPE                PM NO.               COM LAN STAT SR DOT TE RESULT
4         2 W IS IS DTCI    0  0    24    PRATEST3                          D1         INS
5                   DTCI    0  0    24    PRATEST3                          D2         STB
6
7 BSY
8 RTS
9
10
11 HOLD
12 Next
13 SWACT
14
15 Cont
16 LOOPBK
17
18
          LAP2046
TIME 08:58>
```

The only difference between the TTP and the PRADCH layers is that the D-channel cannot be performed or looked at in TTP. It can be in PRADCH. PRADCH is accessed through TTP but is hidden in that it does not show on the menu.

Table 24-5 Description of D-Channel Maintenance Commands

Command	Results
7 or Busy	Manually busy the D-channel or take it out of service.
8 or RTS	Return the D-channel To Service.

Table 24-6 Description of D-Channel Maintenance States

States		
INB	Installation Busy	This is how the B-CH will come up on installation.
MB	Manually Busy	An operator has BSY the channel.
INS	In Service	Normal operation.
LO	Locked-Out	The user has not responded to requests on this channel.
PMB	PM Busy	The XPM is Out of Service.
CFL	Carrier Failure	Carrier Failure.

When using a backup D-channel a new state appears as Stand-By (STB).

D-channel Operational Measurements

To access from a MAP position:

- >OMSHOW PRADCHL2 ACTIVE DTCI0001024
- >OMSHOW PRADCHL2 ACTIVE 0
- >OMSHOW PRADCHL2 HOLDING DTCI0001024
- >OMSHOW PRADCHL2 HOLDING 0

The active register is the currently updating register and the holding register is the last 15 minutes. The D-channel can be specified by the OMs index number (0) or list PM (DTCI), PM # (000), Span (10), Circuit (24) DTC10001024.

Figure 24-4 Operational Measurements PRADCHL2 MAP Display

```
                              PRDDISCT      PRDCRC       PRDDISCR       PRDSOTX

                              PRDSORX      PRDSBMTX      PRDSBMRX       PRDRNRTX

                              PRDRNRRX     PRDREJTX      PRDREJRX       PRFLSHED

   0 DTCI0001024
         0      10      24    (DTCI, SPAN, CIRCUIT)

                                      0            0            0            0

                                      0            0            0            0

                                      0            0            0            0
```

Table 24-7 Description of PRADCHL2 OM Registers

Register	Explanation
PRDCRC	Cyclic Redundancy Check
PRDDISCR	Received Frames Discarded due to errors other than CRC
PRDDISCT	Transmit Frames Discarded due to errors other than CRC
PRDREJRX	Reject Frames Received
PRDREJTX	Reject Frames Transmitted
PRDRNRRX	Receiver Not Ready Frames Received
PRDRNRTX	Receiver Not Ready Frames Transmitted
PRDSORX	Successfully received Service Access Point Identifier (SAPI) Frames
PRDSOTX	Successfully Transmitted (SAPI) Frames
PRDSBMRX	Link Resets Received from Far-end
PRDSBMTX	Link Resets Transmitted to Far-end
PRFLSHED	Flow Shed Q931 messages shed due to flow control queue full

Notes:

- One-minute accumulation for all registers.

- These pegs are zeros during normal operation.

Each of these messages provides clues into possible protocol problems.

Table 24-8 OM Pegs Related to Possible Problems

Type of Peg	Possible Problem
Discarded frames	Layer 2 coding differences
Rejected Frames	Layer 3 coding differences
Resets	Layer 3 Maintenance coding mismatch
Shed messages	D-Channel is being overloaded. Break up the trunk group between two trunk groups on different peripherals.
Not Readies	Window size mismatch

D-channel troubleshooting

When RTSing the D-channel from an MB state, there are four states to which it may move:

- INS - Operating as expected.

- CFL - Go to carrier troubleshooting.

- RNR - Receiver Not Ready. This indicates that the CPE is not ready for traffic. This may be due to an overload at the CPE or a malfunction at the CPE. In either case, it must be cleared at the CPE.

- LO - This indicates there is no communication between the CPE and the DMS. This may or may not be a DMS issue. If this occurs:

  1. Verify the network to user connection. Table TRKSGRP class is set to network. Verify that CPE is set to user.

  2. Verify the protocol. Table LTDEF PROTOCOL is set to NIPRI ISDN, or NTNAPRI . If NTNA connects to M1, SLIPROFL is also set in LTDEF. Verify the CPE Admin end matches.

B-channel Trunk Maintenance

To access from a MAP position:

- >MAPCI;MTC;TRKS;TTP

- >POST G PRATEST1 (Post Trunk-Group for PRATEST1)

Figure 24-5 TTT MAP Display

```
CM        MS        IOD        NET      LNS      TRKS      EXT       APPL


0 QUIT    POST                  DELQ                      BUSYQL            DIG

2 POST    TTP                  6-030
3           CKT TYPE            PM NO.      COM LAN STAT SIR DOT TE   RESULT
4           2 W IS IS DTCI  0 0 23 PRATEST3                              INS
5
6
7 BSY
8 RTS
9
10
11 HOLD
12 Next
13 SWACT
14
15 Cont
16 LOOPBK
17
18
    LAP2046
Time 08:58 >
```

Table 24-9 Description of Trunk Maintenance Commands

Command	Results
5 or Busy	Manually busy the B-channels or take it out of service
6 or RTS	Return the Group of B-channels To Service.

Table 24-10 Description of Trunk Maintenance States

States		
INB	Installation Busy	This is how the B-CH will come up on installation.
MANB	Manually Busy	An operator has BSY the channel.
IDL	In Service Idle	Normal operation.
LO	Locked-Out	User has not responded to requests for this channel.
DMB	D-CH Man Busy	D-channel is Manually Busy.
PMB	PM Busy	The XPM is Out of Service.
CFL	Carrier Failure	Carrier Failure
DFL	D-CH Failure	D-channel Failed
CPB	Call process Busy	Channel is being used on a call.
CPD	Call processing Deload	Channel will go into maintenance when call is completed

Table 24-11 Description of Normal Trunk Maintenance Actions

Carrier	Action	Result
INB	7 or Bsy	MB
MB	8 or RTS	INSV
SYSB	7 or Bsy	MB

B-channel Trunk Operation Measurements

To access from a MAP position:

- >OMSHOW TRK ACTIVE PRI10

- >OMSHOW TRK ACTIVE 75

- >OMSHOW TRK HOLDING PRI10

- >OMSHOW TRK HOLDING 75

The active register is the currently updating register and the holding register is the last 15 minutes. The Trunk Group can be specified by the Administration number (Table CLLI) or the CLLI name. (75 or PRI 10)

Figure 24-6 TRK Operational Measurements MAP Display

```
        INCATOT   PRERTEAB   INFAIL   NATTMPT




        NOVFLATB  GLARE      OUTFAIL  DEFLDCA




        DREU      PREU       TRU SBU




        MBU       OUTMTCHF   CONNECT  TANDEM




        AOF       ANF        TOTU



75 PRI10    (Carrier ADMIN. number, CLLI)
2W      23   23       (Two-way trunk, # of B- CH, # avail to report)

0       0                    0          0
0       0                    0          0
0       0                    0          0
0       0                    0          0
0       0                    0
```

Table 24-12 Description of TRK OM Registers

Register	Explanation
ANF	Bad ANI Signal, AMA, or area code for trunk.
AOF	Incoming calls where far end sends bad ANI.
CONNECT	Successful connections.
DREU	Direction.
DEFLDCA	Network management.
GLARE	B-channel was simultaneously requested by network and user.

Table 24-12 Description of TRK OM Registers

Register	Explanation
INCATOT	Total Incoming Call Attempts.
INFAIL	Termination Failure.
NATTMPT	Number of Attempts Incriminated when call is routed to trunk.
NOVFLATB	Number of Overflows (ALL TRUNKS BUSY).
OUTFAIL	DMS Origination failures.
PRERTEAB	Pre-route Abandon.
PREU	Protective Reservation Usage.
SBU	System Bust Usage when not IDL or CPB.
TANDEM	Incoming calls pre-routed to specific trunk.
TOTU	Total Usage.
TRU	Traffic Busy Usage CPB or LO.
OUTMTCHF	Outgoing Matching Failure.
MBU	Maintenance Busy Usage.

Note: During normal operation all pegs are zero except for NATTMPT = CONNECTS and TRU.

B-channel Trunk Troubleshooting

PRI Trunks are virtually trouble free because they are simply 64K timeslots. Therefore the only issues with a B-channel is one that originated with a D-channel message. The messages of concern are service messages. If the D-channel is INS, the only undesirable B-channel state is LO. Verify the IID in Table LTCPSINV for XPM or Table MNPRIIID for SPM. Match the CPE's IIDs as described in the provisioning section of this document.

If a trunkgroup exhibits call outing failures indicating trunks are not available when in fact there are idle trunk group members there may be an issue where the CPE is not responding to Q.931 Disconnect messages within a 750 MS time frame. The CM waits 750 milliseconds after it releases a call before it will attempt to terminate another call on that same trunk member. This is the amount of time the trunk member is on the guard_queue.

If a PRI trunk problem is suspected to be the trunk state mismatch, investigation of the REL response time from the far end equipment is required,

as well as verification that calls are terminating to treatment even though the DMS CM is showing the trunks as IDLE.

Option 'SZGRDTM - Seize Guard Time' in table LTDEF. Addresses this issue. The option has a sub-field called "INC_250MS" which stands for 250 millisecond increments. The new CM seize guard time is specified in increments of 250ms, with a minimum value of 3 (0.75s) and a maximum value of 60 (15s). This option will allow the user to specify the CM trunk guard time for an individual LTID (Logical Terminal Identifier). This seize guard time will guard a trunk circuit to prevent the CM from attempting to terminate on that trunk circuit for the time specified in the INC_250MS field after the CM clears the previous call.

Please be aware the SZGRDTM option should not be added to an LTID of a PRI trunk group without investigation of the specific problem. Careful consideration and input from a translations/provisioning group is recommended. Specialized applications may require a trial and error approach to arrive at the appropriate SZGRDTM timer value.

The following are example timer value settings and possible effects on the trunk circuit. Recall the DISC message has already been sent down the PRI and the XPM is waiting for a REL message.

<u>T3 (TRKGRDTM + PSPDSEIZ) lowered to equal the SZGRDTM value:</u>

These are the suggested timer settings for this problem since the trunks will be guarded for the least amount of time while at the same time will allow for the trunks to go into a LO state as soon as the trunk is taken off of the guard queue to prevent a state mismatch opportunity. In order to lower the value of T3 both the TRKGRDTM & PSPDSEIZ will be manipulated.

|_____|_____|_____

T1   *T2=T3*   *T4*
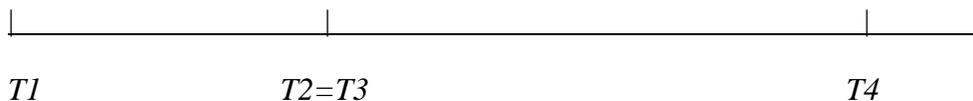
T1 = 0 sec = Disconnect event is sent from the CM. Trunk state is IDLE but not available.

T2 = New CM trunk guard time = SZGRDTM. CM will make the trunk available at this time.

T3 = (TRKGRDTM + PSPDSEIZ). Time the XPM will wait prior to automatically changing the CM trunk state to LOCKOUT if the REL has not arrived.

T4 = Elapsed time for the PBX (IVR) to respond with a RELEASE message in response to the DISCONNECT.

Example

- New SZGRDTM = 10 (250ms increments = 2.5 sec

- TRKGRDTM = 50ms

- PSPDSEIZ = 2sec

Note: The DMS may experience an increased number of lockout (LO) messages - TRK110/112 logs - if the timers are set considerably lower than the average time it takes for the far end to send a RELEASE message.

The trunk guard time will default to the hard coded CM trunk guard time of 0.75 seconds if the SZGRDTM option is not used in Table LTDEF.

List of terms

This document contains a list of terms used exclusively for ISDN Primary Rate Interface (PRI).

Other DMS-100 switch related terms can be found in the reference manual, NTP 297-1001-825, *Glossary of Terms and Abbreviations*.

2B1Q

Two binary one quaternary. The interface standard for ISDN basic rate interface (BRI) transmission between the network and the network termination 1 (NT1) as defined by the American National Standards Institute (ANSI).

access module (AM)

The unit that provides access to the network modules (NM) of a digital packet network switching system from a local end user packet data line or the digital interworking unit (DIU).

access privilege (AP)

A term used to define bearer services for an ISDN logical terminal. Northern Telecom currently defines four APs: B (circuit-switched voice and data), D (low-speed packet data), PB (high-speed packet-switched data), and BD (circuit-switched voice and low-speed packed-switched data).

access termination (AT)

The functional term to describe the part of the exchange termination which terminates the access interfaces (BRI and PRI). It defines the access privileges of the terminals on an interface, and provides the terminals on an interface with access to ISDN circuit- and packet-switching services.

agent

See telephony agent.

AM

See access module (AM).

AMA

See automatic message accounting (AMA).

AP

    See access privilege (AP).

Automatic message accounting (AMA)

    An automatic recording system that documents all the necessary billing data of end user-defined long distance calls.

basic rate access functional set (BRAFS)

    An ISDN set that uses functional signaling. The Meridian M5317T is the BRAFS for Northern Telecom. *See also* functional signaling.

basic rate access key set (BRAKS)

    An ISDN set that uses stimulus signaling. The Meridian M2317T is the BRAKS for Northern Telecom. *See also* functional signaling, stimulus signaling.

basic rate interface (BRI)

    A type of access to ISDN service provided by a set of time-division multiplexed digital channels of information, including two B-channels, one D-channel, and one or more maintenance channels, often described as 2B (channels) + D (channel). A BRI is typically used on lines between customer premises and a central office switch. Formerly known as basic rate interface (BRA).

BC

    See bearer capability (BC).

B-channel

    A 64-kbit/s digital bidirectional channel used by ISDN for carrying either circuit-switched voice or data, or packet-switched data.

Bb

    A B sub-b channel. A 64-kbit/s channel carrying multiplexed B-channel data packets to the packet handler. *See also* B-channel.

Bd

    A B sub-d channel. A DS-0 channel that carries low-speed, packet-switched data statistically multiplexed from up to 64 different sources. Bd is one of 24 channels on a DS-1 facility between the ET and the PH.

bearer capability (BC)

    A characteristic associated with a directory number (DN) to indicate the type of call (voice or data) and the rate of transmission that is allowed. Bearer capability is also an information element that is carried in the setup message for functional signaling to indicate the type of call (voice or data) and the rate of transmission required (for ISDN). *See also* authorized call type, bearer services.

bearer services

Characteristic that is associated with a logical terminal (service profile) in functional signaling. It offers a pool of bearer capabilities to a logical terminal. Also called authorized call type.

Bell Communications Research (Bellcore)

A group responsible for coordinating Bell operating company projects and setting guidelines for a switching system.

Bellcore

See Bell Communications Research (Bellcore).

BIC

See bus interface card (BIC).

B-packet

Packet data that is transmitted over a B-channel.

BRAFS

See basic rate access functional signalling (BRAFS).

BRAKS

See basic rate access key set (BRAKS).

BRAMFT

basic rate access Meridian functional signalling (BRAMFT).

BRI

See basic rate interface (BRI).

bus interface card (BIC)

A hardware interface that connects two 32-channel digroups to a maximum of 64 line cards. This card is located in the drawer of the line concentrating module (LCM).

B-voice

A pulse code modulated voice signal carried on a B-channel.

calling line identification (CLI)

In data transmission, a feature provided by the network that allows a called terminal to be notified by the network of the address from which the call has originated. Screening of CLI is performed during call setup only.

call processing

The software that handles the processes involved in setting up connections through the DMS-100 Family network between calling and called parties.

call reference

This identifies the call on the local ISDN interface to which the message applies. Stimulus call control messages have dummy call references because the network controls the call. Functional call control messages are used by the ISDN terminal to distinguish between call appearances of the same directory number, and to selectively control a number of simultaneous calls (for example, an active call, calls on hold, calls waiting).

call type

See authorized call type *and* bearer services.

CCC

See central control complex (CCC).

CCITT

See Consultative Committee on International Telephony and Telegraphy (CCITT).

CCS7

See Common Channel Signaling 7 (CCS7).

central control complex (CCC)

The part of the DMS-100 Family switch that contains all the current control (CC) functions including the central message controller (CMC), CPU, program store (PS), and data store (DS).

central office (CO)

A switching office (SO) arranged for terminating end user lines and provided with switching equipment and trunks for establishing connections to and from other SOs. Also known as a local office.

CLI

See calling line identification (CLI).

Common Channel Signaling 7 (CCS7)

A digital message-based network signaling standard, defined by the CCITT, that separates call signaling information from voice channels so that interoffice signaling is exchanged over a separate signaling link.

CDTE

ISDN cabinetized digital trunk equipment

central side (C-side)

The side of a node that faces away from the peripheral modules (PM) and toward the central control (CC). Also known as control side. *See also* peripheral side (P-side).

channel supervision message (CSM)

A message received and transmitted continuously on each connected voice channel of a peripheral module. The CSM contains a connection data byte, which includes the channel supervision bit, and an integrity byte, which issues call path integrity.

circuit-switched network

Synonym for the telephone network.

CLGE

ISDN cabinetized line group equipment

CLMI

Cabinetized line module ISDN

CO

See central office (CO).

Consultative Committee on International Telephony and Telegraphy (CCITT)

The CCITT is one of the four permanent groups within the International Telecommunication Union (ITU). The CCITT is responsible for studying technical, operating, and tariff questions. This organization also prepares recommendations relating to telephony and telegraphy, including data and program services.

CPE

See customer premises equipment (CPE).

CS-data

Circuit-switched data carried on B-channel

C-side

See central side (C-side).

CSM

See channel supervision message (CSM).

customer premises equipment (CPE)

Equipment, such as ISDN terminals, that is located on the customer's premises.

data link layer

Layer 2 in the open systems interconnection (OSI) model that is used to create logical links between ISDN terminals and the services they access. The datalink layer provides error-free, sequenced messaging over a channel.

data network address (DNA)

A number that accesses a terminal on the packet-switched network.

data network identification code (DNIC)

For ISDN, a code that is used in packet switching to identify the network being addressed.

data packet network (DPN)

A packet-switched networking system that is manufactured by Northern Telecom.

data store (DS)

One of the two distinct elements of a DMS-100 memory, DS is part of the central control complex (CCC). It contains transient information for each call as well as customer data and office parameters. The other main element of a DMS-100 memory is program store (PS). *See also* program store (PS), protected store (PROT).

D-call control

Call control information that is carried on the D-channel and used to establish, maintain, or clear a voice or circuit-switched data call on a B-channel of an ISDN.

DCC

See digroup control card (DCC).

DCH

See D-channel handler (DCH).

D-channel

For BRI, the D-channel is a 16 kbit/s, bi-directional channel. A D-channel carries call control messages between a terminal on an ISDN interface and the exchange termination. These call control messages are used to set up, maintain, or clear a circuit-switched call on a B-channel. The D-channel also carries low-speed packet data between a terminal on an ISDN interface and a terminal in the packet data network. For PRI, the D-channel is a 64 kbit/s, bi-directional channel. *See also* Bd channel, BRI, PRI.

D-channel handler (DCH)

A card in an ISDN line group controller (LGCI) or in an ISDN line trunk controller (LTCI) that provides the primary interface to all D-channels. The DCH also performs Q.921 LAPD layer 2 processing. The DCH is assigned to an ISDN loop and receives or sends messages on the signaling/packet data channel.

digital interworking unit (DIU)

The unit in a digital packet network switch that converts B-channel and D-channel data packets received in a DS-1 format from the ISDN access controller to a VR-35 format that is suitable for the access module. For packets being sent in the opposite direction, the DIU performs the reverse conversion.

digroup control card (DCC)

A circuit that makes up part of the line concentrating module (LCM) unit control complex. DCC provides eight DS30A ports for connection to the network in the host LCM or to the host interface equipment (HIE) shelf in the remote line concentrating module (RLCM).

direct memory access (DMA)

A device for moving blocks of continuous data to and from memory at a high rate.

directory number (DN)

The full complement of digits required to designate a end user's station within one numbering plan area (NPA)—usually a three-digit central office code followed by a four-digit station number.

DIU

See digital interworking unit (DIU).

DMA

See direct memory access (DMA).

DMS PH

DMS packet handler

DN

See directory number (DN).

DNA

See data network address (DNA).

DNIC

See data network identification code (DNIC).

D-packet

Packet data carried on the D-channel between the packet handler and an ISDN terminal.

DPN

See data packet network (DPN).

DS

See data store (DS).

DS-0

A protocol for data transmission that is used to represent one channel in a 24-channel DS-1 trunk.

DS-1

A closely specified bipolar pulse stream with a bit rate of 1.544 Mbit/s. It is the standard signal used to interconnect Northern Telecom digital systems. The DS-1 signal carries 24 DS-0 information channels of 64 kbit/s each.

DS30 link

1. A 10-bit, 32-channel, 2.048-Mbit/s speech-signaling and message-signaling link as used in the DMS-100 Family. 2. The protocol by which DS30 links communicate.

DS30A link

A 32-channel transmission link between the line concentrating module and controllers in the DMS-100 Family. DS30A is similar to DS30, though intended for use over shorter distances.

DTCI

See ISDN digital trunk controller (DTCI).

DTCOi

See ISDN digital trunk controller offshore (DTCOi).

DTEI

See ISDN digital trunk equipment frame (DTEI).

E.164

The public network numbering plan in accordance with CCITT Recommendation E.164.

EAEO

See equal access end office.

EISP

See enhanced ISDN signaling preprocessor (EISP).

EKTS

See electronic key telephone service (EKTS).

electronic key telephone service (EKTS)

A set of services for ISDN voice terminals on a basic rate interface. EKTS provides shared directory numbers (DN), multiple DNs for each service profile, and conference and intercom calling.

end office (EO)

A switching office (SO) arranged for terminating end user lines and provided with trunks for establishing connections to and from other SOs. *See also* central office (CO).

enhanced ISDN signaling preprocessor (EISP)

Provides call control messaging and D-channel handler maintenance functions, similar to the ISP, but with memory upgrade from 1 Mbyte to 4 Mbyte, clock speed upgrade from 16 MHz to 20 MHz, and data bus upgrade from a 16 bit width to 32 bits.

enhanced line concentrating module (LCME)

A dual-unit peripheral module that terminates ISDN 2B1Q U-type lines, ISDN S/T-type lines, plain ordinary telephone service (POTS), electronic business sets (EBS), and Datapath lines. LCME also provides access to the ISDN B-, D-, and M-channels. The LCME supports 480 POTS, EBS, or ISDN U- lines, or 240 Datapath or S/T- lines.

enhanced service provider (ESP)

A third-party vendor that supplies value-added services to the end user.

enhanced services test unit (ESTU)

A stand-alone test unit that performs metallic and digital line tests at remote or host sites for ISDN services.

EO

See end office (EO).

equal access end office

A central office that provides access to several long distance carriers.

ESP

See enhanced service provider (ESP).

ESTU

See enhanced services test unit (ESTU).

ET

See exchange termination (ET).

ETSI

European Telecommunications Standards Institute

exchange termination (ET)

The functional name for the component of the ISDN that serves as the access termination for BRI and PRI interfaces, and provides circuit-switched services to the ISDN switch.

F-bus

See frame transport bus.

feature indicator (FI)

A device that indicates the state or condition of a call when using a supplementary service on an ISDN stimulus terminal with circuit-switched service.

FI

See feature indicator (FI).

foreign exchange (FX)

A service that allows a telephone or a PBX to be served by a distant central office (CO), rather than by the CO in the immediate geographical area.

frame transport bus (F-bus)

An eight-bit bus that provides data communications between a local message switch (LMS) and the link interface units that are provisioned in a link peripheral processor (LPP). To ensure readability, two load-sharing F-buses are provided in an LPP. Each F-bus is dedicated to one of the two LMSs. *See also* link interface module.

functional signaling

An intelligent terminal in which call control functions are shared between the switch and the terminal.

FX

See foreign exchange (FX).

HFP

HDLC frame processor

HIE

See host interface equipment (HIE).

high-level data link control

The channel by which high-level control messages from the central control are carried between the digital carrier module and remote line modules.

host interface equipment (HIE) shelf

In the remote line concentrating module (RLCM) frame, this shelf provides interface circuits between the host office and the RLCM.

IBERT

See integrated bit error rate test (IBERT).

IEC

Inter-exchange carrier

initial program load (IPL)
> The initialization procedure that causes a computer operating system to start operation.

integrated bit error rate test (IBERT)
> A test that a MAP operator uses with an IBERT card to test the transmission quality of a selected data line. The card resides in the line drawer of a line concentrating module and generates the bit stream for an IBERT.

integrated services access (ISA)
> Uses call setup messages and dialed digits to permit access to public and private network services through one bidirectional common access facility. ISA provides the capability to support multiple call types (such as PUBLIC, PRIVATE, OUTWATS, INWATS, FX, and TIE) on a single trunk.

integrated services digital network (ISDN)
> A set of standards proposed by the CCITT to establish compatibility between the telephone network and various data terminals and devices. ISDN is a communications network that provides access to voice, data, and imaging services from a single type of connector.

inter-LATA
> Telecommunications services, revenues, and functions that originate in one local access and transport area (LATA) and terminate either outside that LATA or inside another LATA.

International Standards Organization (ISO)
> The organization responsible for creating a seven-layer protocol model for a data communications network.

intra-LATA
> Telecommunication services, revenues, and functions that originate in one local access and transport area (LATA) and terminate either outside that LATA or inside another LATA.

IPL
> *See* initial program load.

ISA
> *See* integrated services access (ISA).

ISDN
> *See* integrated services digital network (ISDN).

ISDN access controller
> A frame used to support ISDN access between a DMS and voice and packet services.

ISDN digital trunk controller (DTCI)

A dual-unit peripheral module that provides access for ISDN primary rate interface to a digital private branch exchange (PBX). The DTCI provides call control for PRI functional signaling, and performs functions similar to the LGC, including D-channel handling and processing, and maintenance and diagnostics.

ISDN digital trunk controller offshore (DTCOi)

A peripheral module (PM) that connects DS30 links from the network with digital trunk circuits with ISDN.

ISDN digital trunk equipment (DTEI) frame

A frame containing up to two dual-shelf ISDN digital trunk controllers.

ISDN line

The physical part of a basic rate interface (BRI) that connects the terminals to the network termination (NT1).

ISDN line concentrating array (LCAI)

A shelf in the ISDN line concentrating module (LCME). It contains four physical line drawers. The LCME consists of two line concentrating arrays, which operate in a load sharing mode with mutual takeover capability.

ISDN line concentrating equipment (LCEI)

A single-bay equipment frame containing two LCMEs.

ISDN line group controller (LGCI)

A peripheral module that connects DS30 links from the network.

ISDN line trunk controller (LTCI)

A peripheral module that is a combination of the line group controller and the digital trunk controller, and provides all of the services offered by both.

ISDN service group (ISG)

Defines the services that a D-channel handler (DCH) provides and their allocation to the channels within the DCH. ISG allows hardware-independent access to service-related functions at the MAP. The ISG MAP level provides a view of the services and the DCH MAP level provides a view of the hardware.

ISDN signaling preprocessor (ISP)

Provides call control messaging and D-channel handler maintenance functions.

ISDN switch

A DMS switch configured to provide ISDN services. Its main functional components are the exchange termination and the packet handler.

ISDN terminal

A digital telephone or personal computer that is connected to a customer premises loop which forms part of a BRI.

ISDN U-line card (U-ISLC)

An ISDN line card which terminates the U-loop in the enhanced line concentration module (LCME). When a U-ISLC is used, the network termination 1 (NT1) situated on customer premises acts as the network termination. Synonymous with ISLC and U-line card.

ISDN user part (ISUP)

A CCS7 message-based signaling protocol which acts as a transport carrier for ISDN services. The ISUP provides the functionality within a CCS7 network for voice and data services.

ISG

See ISDN service group (ISG).

ISLC

See ISDN U-line card (ISLC).

ISO

See International Standards Organization (ISO).

ISP

See ISDN signaling preprocessor (ISP).

ISUP

See ISDN user part (ISUP).

kbit/s

See kilobits per second (kbit/s).

kilobits per second (kbit/s)

A bit rate expressed in thousands of bits per second.

LAPB

See link access procedure balanced (LAPB).

LAPD

See link access procedure on the D-channel (LAPD).

LATA

See local access and transport area (LATA).

L-bus

A bi-directional link that acts as the interface between the bus interface card and the line card in an enhanced line concentrating module (LCME).

LC

See line circuit (LC).

LCAI

See ISDN line concentrating array (LCAI).

LCC

See Line Class Code (LCC).

LCEI

See ISDN line concentrating equipment (LCEI).

LCM

See line concentrating module (LCM).

LCME

See enhanced line concentrating module (LCME).

LD

See line drawer (LD).

LEN

See line equipment number (LEN).

LGC

See line group controller (LGC).

LGCI

See ISDN line group controller (LGCI).

LIM

See link interface module.

line circuit (LC)

A hardware device that provides an interface between end user lines and the digital switch. Each end user line has a dedicated line circuit. *See also* line drawer (LD).

Line Class Code (LCC)

An alphanumeric code that identifies the class of service assigned to a line.

line concentrating module (LCM)
> A peripheral module which interfaces the line trunk controller or line group controller and up to 640 end user lines, using two to six DS30A links.

line drawer (LD)
> A hardware entity located in the LCME that contains line circuit cards.

line equipment number (LEN)
> A seven-digit function-reference used to identify line circuits.

line group controller (LGC)
> A peripheral module that connects DS30 links from the network to the LCME.

line trunk controller (LTC)
> A peripheral module that is a combination of the line group controller and the digital trunk controller, and provides all the services offered by both.

link access procedure balanced (LAPB)
> ISDN access protocol that is used with links established on a B-channel. LAPB supports a single data link that operates with a fixed, single-byte address convention between the ISDN terminal and the network.

link access procedure on the D-channel (LAPD)
> ISDN access protocol that is used with links established on a D-channel.

link interface module (LIM)
> A peripheral module that controls messaging between link interface units (LIU) in a link peripheral processor (LPP). The LIM also controls messages between the LPP and the DMS-bus. An LIM consists of two local message switches (LMS) and two frame transport buses (F-bus). One LMS normally operates in a load sharing mode with the other LMS. This ensures LIM reliability in the event of an LMS failure because each LMS has adequate capacity to carry the full message load of an LPP. Each LMS uses a dedicated F-bus to communicate with the LIUs in the LPP.

link interface unit (LIU)
> A peripheral module that processes messages entering and leaving a link peripheral processor through an individual signaling data link. *See also* CCS7 link interface unit 7.

link peripheral processor (LPP)
> The DMS SuperNode equipment frame for DMS-STP that contains two types of peripheral modules: an LIM and an LIU. For DMS-STP applications, CCS7 link interface units 7 (LIU7) are used in the LPP. *See also* link interface module.

LIU

See link interface unit (LIU).

local access and transport area (LATA)

A geographic area within which an operating company may offer telecommunications-related services. *See also* inter-LATA and intra-LATA.

logical terminal (LT)

The datafilled instance of an abstract terminal that is provided with a subset of the features and services (service profile) datafilled in the access termination for the abstract terminal.

logical terminal identifier (LTID)

The unique identifier that is assigned to a logical terminal when it is datafilled in the ISDN access termination.

LPP

See link peripheral processor (LPP).

LTC

See line trunk controller (LTC).

LTCI

See ISDN line trunk controller (LTCI).

LTID

See logical terminal identifier (LTID).

maintenance trunk module (MTM)

In a trunk module equipment (TME) frame, a peripheral module (PM) that is equipped with test and service circuit cards and contains special buses to accommodate test cards for maintenance. The MTM provides an interface between the DMS-100 Family digital network and the test and service circuits.

MAP

The maintenance and administration position. MAP is a group of components that provides a user interface between operating company personnel and the DMS-100 Family systems. A MAP consists of a visual display unit and keyboard, a voice communications module, test facilities, and MAP furniture. MAP is a trademark of Northern Telecom.

Mbit/s

See megabits per second (Mbit/s).

M-channel

A 16-kbit/s, bi-directional, U-loop channel used to transfer maintenance information between the NT1 and the exchange termination.

megabits per second (Mbit/s)
> Expresses the rate of transmission of serial data bits in a time-division multiplexed frame format.

MTM
> *See* maintenance trunk module (MTM).

NAS
> *See* network administration system (NAS).

network administration system (NAS)
> A stand-alone computer that is involved in operation, administration, and maintenance for integrated services digital network (ISDN) services. The NAS uses data on service and system operation to generate files that contain information on alarms, accounting, billing, and network operation.

network interface unit
> A DMS SuperNode application specific unit (ASU) that provides channelized access for F-bus resident link interface units (LIU) using a channel bus (C-bus). The NIU resides in a link peripheral processor (LPP) frame.

network layer
> Layer 3 in the OSI model. In ISDN, the network layer is used to send call control messages.

network modules (NM)
> The basic building block of the DMS-100 Family switches. The NM accepts incoming calls and uses connection instructions from the central control complex (CCC) to connect the incoming calls to the appropriate outgoing channels. Network module controllers control the activities in the NM.

network termination 1 (NT1)
> Access point for basic rate interface to ISDN. This component is situated on customer premises and is typically located between the terminals and the exchange termination. An NT1 is required when ISDN lines are terminated by U-line cards.

NIU
> *See* network interface unit.

NT1
> *See* network termination 1 (NT1).

NTP
> Northern Telecom Publication

open system interconnection (OSI)

A 7-layer protocol model for communications networks developed by the International Standards Organization and adopted by the Consultative Committee on International Telephony and Telegraphy (CCITT) for an Integrated Services Digital Network (ISDN).

OSI

See open system interconnection (OSI).

packet handler (PH)

The CCITT term for the component of an ISDN switch that provides packet switching services.

PCM

See pulse code modulation (PCM).

PCM30 digital trunk controller (PDTC)

A digital trunk interface that has the hardware configuration of an international digital trunk controller (IDTC) but runs the software of a digital trunk controller (DTC).

PCM30

A 32-channel 2.048-Mbit/s speech-signaling and message-signaling link used in international trunks.

PDTC

See PCM30 digital trunk controller (PDTC).

peripheral module (PM)

A generic term referring to all hardware modules of DMS-100 Family systems that provide interfaces with external line, trunk, or service facilities. A PM contains peripheral processors, which perform local routines, thus relieving the load on the central processing unit.

peripheral side (P-side)

The side of a node facing away from the central control and towards the peripheral modules. *See also* central side (C-side).

permanent virtual circuit (PVC)

A continuously available virtual path between remote applications and DMS applications. The PVC eliminates the need to establish a circuit on an each call basis.

per trunk signaling (PTS)

Conventional telephony method, which multiplexes a call's control signals with voice or data over the same trunk.

PH

    See packet handler (PH).

PM

    See peripheral module (PM).

point-of-use power supply (PUPS)

    The type of power supply used for an enhanced line concentrating module (LCME). It provides 5V power supply for ISDN line cards. There is one PUPs for each line drawer.

PPSN

    See public packet-switched network (PPSN).

PRI

    See primary rate interface (PRI).

primary rate interface (PRI)

    An interface that carries nB+D channels over a PCM30 digital facility (generally 30B+D for ETSI PRI). PRI is used to link private networking facilities, such as private branch exchanges (PBX), local area networks (LAN), and host computers with a standardized architecture acting as the bridge between private switching equipment and the public network. Formerly known as primary rate access (PRA).

product engineering code

    An 8-character code that provides a unique identification for each marketable product manufactured by Northern Telecom.

program store (PS)

    In a DMS-100 switch, programmed instructions for the various procedures required to perform processing, administration, and maintenance. Program store is one of the two distinct elements of a DMS-100 memory. The other main element is data store. See also data store (DS), protected store (PROT).

PROT

    See protected store (PROT).

protected store (PROT)

    In a DMS-100 switch, store type (program or data) that must be explicitly unprotected before any write operation and protected again afterward. This type of store remains allocated and its contents remain intact over all restarts except initial program load (IPL). Protected store is used to hold the office database and translation data equipment configurations. *See also* data store (DS), program store (PS).

PS

    See program store (PS).

PSDS

    See public switched data service (PSDS).

P-side

    See peripheral side (P-side).

PTS

    See per trunk signaling (PTS).

public packet switched network (PPSN)

    Any common carrier network designed to carry data in the form of packets between public users.

public switched data service (PSDS)

    Any common carrier network designed to switch data, not necessarily in packet form, between public users.

pulse code modulation (PCM)

    Representation of an analog waveform by coding and quantizing periodic samples of the signal, so that each element of information consists of a binary number representing the value of the sample.

PUPS

    See point-of-use power supply (PUPS).

PVC

    See permanent virtual circuit (PVC).

Q.921

    The CCITT recommendation that defines protocols at the datalink layer.

Q.931

    The CCITT recommendation that defines protocols for circuit-switched call control at the network layer.

remote line concentrating module (RLCM)

    An equipment frame that provides an interface between two to six DS-1 links (from the line group controller LGC) at the host office) and up to 640 end user lines (connected locally). An RLCM is equipped with one line concentrating module (LCM), a remote maintenance module (RMM), and a host interface equipment (HIE) shelf.

remote maintenance module (RMM)

A peripheral module (PM) with a configuration similar to that of the maintenance trunk module (MTM). An RMM accommodates up to 12 service and test cards.

RLCM

See remote line concentrating module (RLCM).

RMM

See remote maintenance module (RMM).

SAPI

See service access point identifier (SAPI).

service access point identifier (SAPI)

Identifier that is used by datalink layer (layer 2) protocol to define the type of service allowed to an ISDN terminal.

signaling processor (SP)

The interface between a master processor and the control circuits in the line-side of a line module. Through the SP, the line circuits, ringing multiplexers, programmable ringing generators, and the activity circuit are controlled, and their status reported.

SO

See switching office (SO).

SP

See signaling processor (SP).

S/T bus

An eight-wire bus (of which only four wires are used to transmit and receive messages) that connects terminals to the NT1 for access to the ISDN. Also known as an S/T-interface and an S/T-loop. Formerly known as a T-bus.

stimulus signaling

For ISDN call control, stimulus signaling mode messages for call control are sent by the terminal to the network as a direct result of actions by the terminal user. Terminals that use stimulus signaling have little local intelligence and are driven by the network. These terminals do not keep records of call states. *See also* functional signaling.

S/T-interface

CCITT name for the S/T-bus.

S/T-line card

An ISDN line card that terminates the S/T-bus in the LCME. When S/T-line cards are used, the U-interface and the NT1 are not required. The exchange termination acts as a network termination. *See also* U-line card.

switching office (SO)

A node in the Common Channel Signaling 7 (CCS7) network that originates and terminates signaling messages related to the set up and take down of associated ISDN user part (ISUP) trunks.

TA

See terminal adapter (TA).

telephony agent

Any kind of line, trunk, or special service circuit that performs a telephony function. *See also* agent.

terminal adapter

A device with associated software that allows a personal computer to connect to a Northern Telecom ISDN.

TME

See trunk module equipment (TME) frame.

trunk module equipment (TME) frame

A frame containing one or more trunk modules (TM), maintenance trunk modules (MTM), or office alarm units (OAU).

U-interface

The CCITT term for a U-loop. *See also* U-loop.

U-line card

ISDN line card that terminates the U-loop in the LCME. When U-line cards are used, the NT1, situated on customer premises, acts as the network termination.

U-loop

The portion of a BRI that connects an NT1 to an ISDN line concentrating module or an enhanced line concentrating module (LCME). *See also* U-interface.

unified processor (UP)

A processor that replaces the master processor (MP), signaling processor (SP), and the memory cards associated with these processors.

universal terminal adapter (UTA)
> A device with associated software that allows non-ISDN devices such as personal computers to connect to a Northern Telecom ISDN line.

UP
> *See* unified processor.

VC
> *See* virtual circuit.

virtual circuit
> In packet switching, a network facility used for transferring data between those data stations emulating physically-connected stations.

X.31
> CCITT recommendation for support of terminal equipment by ISDN

X.121
> CCITT standard for data network address

XMS-based peripheral module (XPM)
> The generic name for peripheral modules (PM) that use the Motorola 68000 microprocessor. An XPM has two processors in a hot-standby configuration: a master processor (MP) and a signaling processor (SP).

XPM
> See XMS-based peripheral module (XPM).

XPM Plus
> XMS-based peripheral module that uses enhanced hardware and software

DMS-100 Family

NTNA ISDN Primary Rate Interface (PRI) NI-1

Service Implementation Guide

NORTEL NETWORKS

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