555-8001-101

Basic Call Service

Network Services

Document 1.0, Status: Standard, Date: August 1990

DMS/Meridian

Networking Services

Basic Call Service

Publication number: 555-8001-101
Document status: Standard
Document release: 1.0
Date: August 1990

Revision history

August 1990

Document release 1.0, Standard version.

Contents

Figures

Tables

About this document

This document is for telecommunications managers and experienced craftspersons involved in providing basic call service over ISDN networks. This group includes PBX distributors, PBX owners, interexchange carriers, Telco providers, and consultants. It provides the network parameters required to install, support, and maintain basic call service.

This manual documents:

- BCS 30 for the DMS family and Meridian 1/SL-100
- Release 15 for the Meridian 1/SL-1.

It includes the following information:

- an overview of basic call as an ISDN network service
- technical information and procedures for configuring, administering, and maintaining network links to support basic call. Network links may include any combination of:
  - Meridian SL-1
  - Meridian SL-100
  - DMS-100
  - DMS-250
- additional technical information specific to an ISDN node for basic call service.
- ESN signaling as part of basic call service.

Refer to Northern Telecom Practices (NTPs) for detailed elements of ISDN networking not presented here.

This manual was written as a high-level reference manual and assumes a working knowledge of ISDN. It is presented as a series of modules for ease of reference. Information is summarized in figures or tables wherever possible for conciseness.

How to use COMPASS with this document

The COMPASS viewer gives you the capability to search a document using keywords. You can search for single or multiple keywords within the document. When you search for multiple keywords, COMPASS generates a list of pages that contain *all* search words This helps you further define your search. For example, you can search on *DMS-250* and *installation* to find the installation procedures that apply only the the DMS-250.

It is important to note that this search procedure applies only to a document *Search*. It does not apply to the *Global Search* function for files.

This document is organized with important keywords in page headers, text headings, figure titles, and table titles to assist your search.

Using acronyms to search a document

The best way to search a document is to use acronyms. A search using acronyms finds all occurrences of relevant information. A list of important keywords and acronyms for basic call service follows.

You may also search according to individual table names (such as BCDEF) or by job function as follows: engineering planning (PLAN), installation (INS), datafill (ADMIN), traffic and operational measurements (OMs), and maintenance (MAINT).

Important keywords and acronyms for basic call

BC	Bearer Capability
CBC	Call-By-Call service
CDN	Called Number
CGN	Calling Number
CHID	Channel Identifier
CSE	Cause
E.164	North American public dialing plan
ESN	Electronic Switch Network
ETN	Electronic Tandem Network
IE	Information Element
IID	Interface Identifier
ISA	Integrated Services Access
ISL	ISDN Signaling Link
NCOS	Network Class of Service
NPI	Numbering Plan Indicator
NSF	Network Specific Facility
PI	Progress Indicator
PUB	Public call type
PVT	Private call type
SWACT	Switch Activity
TCOS	Traveling Class of Service
TNCOS	Terminal Number Class of Service
TNS	Transit Network Selector
TN	Transit Number
TON	Type of Number

General list of acronyms

A/B	A and B bit signaling
BARS	Basic Alternate Route Selection
B8ZS	Bipolar 8-Zero Substitution
CLLI	Common Language Location Identifier
CNAC	Call Not Accepted
DMI	Digit Manipulation Index
DMS	Digital Multiplex System
DRAM	Digitally Recorded Announcement
DTCI	ISDN Digital Trunk Controller
IBN	Integrated Business Network
IEC	Interexchange Carrier
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
LEC	Local Exchange Carrier
LTID	Logical Terminal Identifier
NARS	Network Automatic Route Selection
NPA	Numbering Plan Area
OM	Operational Measurement
PBX	Private Branch Exchange
POTS	Plain Old Telephone Service
PRI	Primary Rate Interface
PTS	Per Trunk Signaling
Q.931	ISDN protocol for D-channel messages
RAN	Recorded Announcement
SS7	Signaling System #7
SWACT	Switch Activity
VFG	Virtual Facility Group

Overview

This section provides an overview of basic call service and ESN signaling in Integrated Services Digital Network (ISDN) networks.

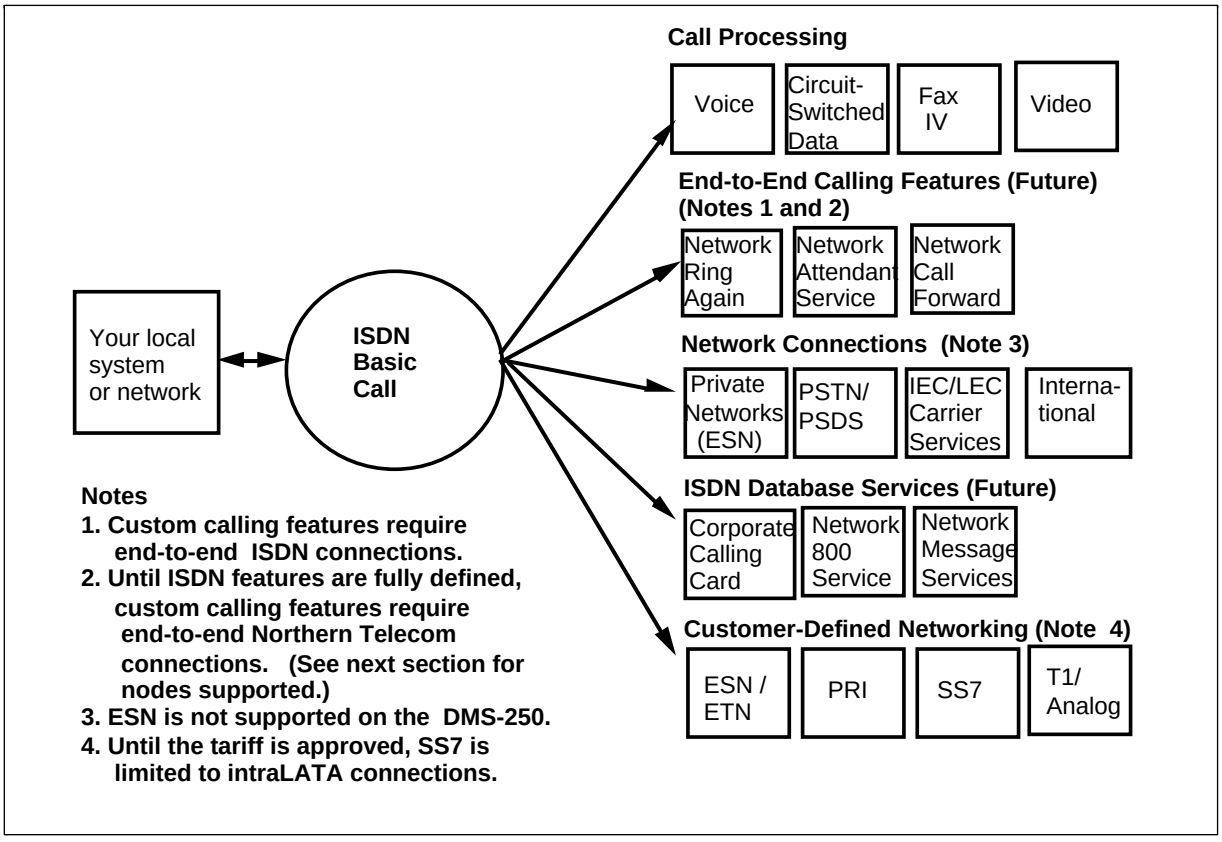
ISDN network characteristics of basic call

Basic call service provides end-to-end connections for ISDN calls. Call connections are made using Primary Rate Interface (PRI) or Signaling System 7 (SS7) protocol across any link. These are message-based protocols that use common channel signaling for faster call setup and response times. Information elements within messages activate networkwide calling features (such as network ring again) and applications. Figure 1 summarizes the major network characteristics of basic call.

Basic call service includes voice and circuit-switched (not packet-switched) data calls. Voice, data, facsimile, and video calls are switched transparently using the same transmission facilities.

Two dialing plans are supported: North American 10-digit numbering plan and Electronic Switching Network (ESN), Northern Telecom's private network dialing plan. Access to Electronic Tandem Network (ETN) nodes is also supported for some connections.

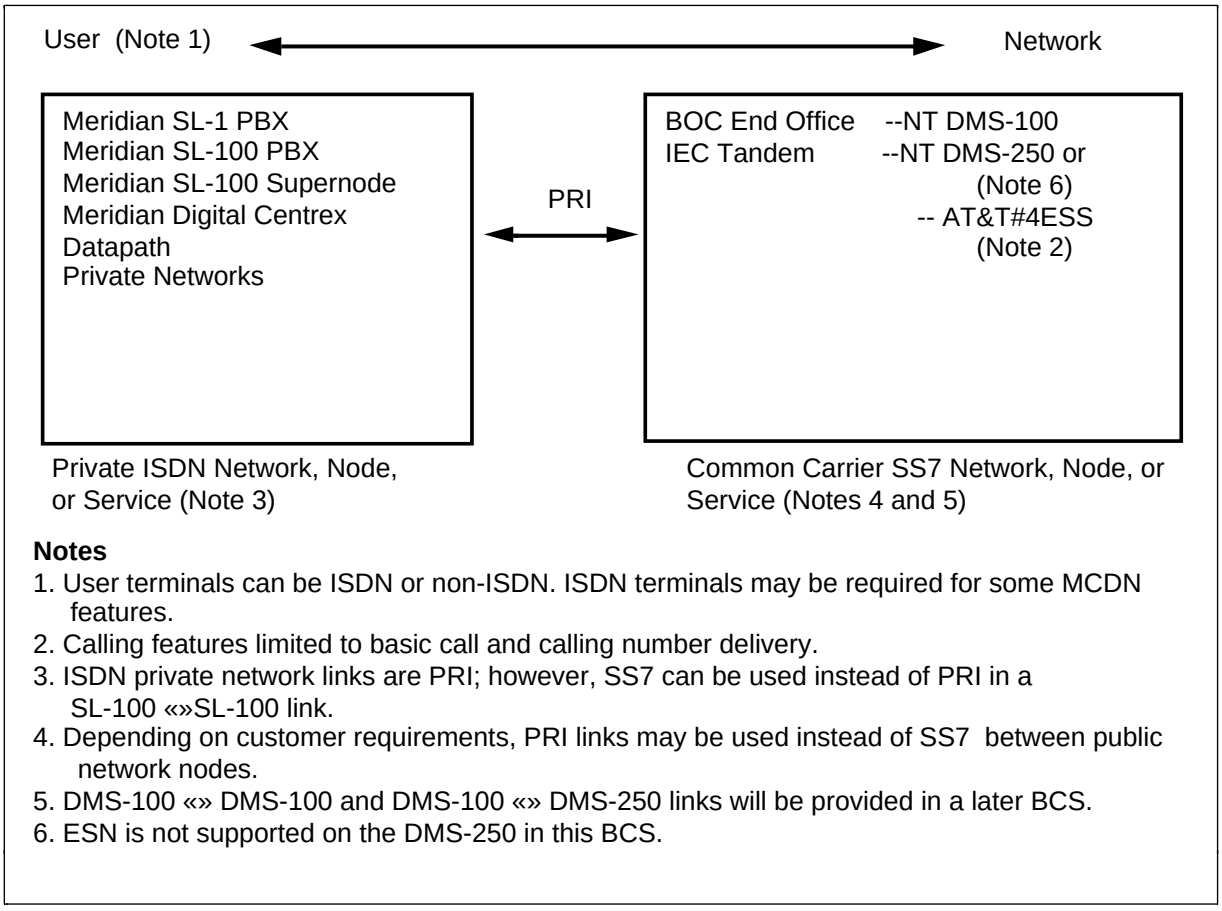
Figure 1
Basic call network characteristics



Network implementation of basic call

PRI protocol links private network facilities to other private network facilities or to public networks (see Figure 2). Although public networks typically use SS7 links, they may also use PRI links.

Figure 2
Network elements of basic call



Notes

1. User terminals can be ISDN or non-ISDN. ISDN terminals may be required for some MCDN features.
2. Calling features limited to basic call and calling number delivery.
3. ISDN private network links are PRI; however, SS7 can be used instead of PRI in a SL-100 «»SL-100 link.
4. Depending on customer requirements, PRI links may be used instead of SS7 between public network nodes.
5. DMS-100 «» DMS-100 and DMS-100 «» DMS-250 links will be provided in a later BCS.
6. ESN is not supported on the DMS-250 in this BCS.

Basic call connections

An ISDN node can function as an endpoint (originating or terminating) or as a direct access tandem in a public or private network. Table 1 lists compatible ISDN connections by switch type.

Note 1: Because ISDN is an evolving product, connectivity to other vendors equipment and ISDN services will increase with each software release.

Note 2: A single customer group can have a mix of ISDN/non-ISDN terminals, access, and facilities.

Table 1
ISDN connections supported

Meridian SL-1	Meridian SL-100	DMS-100/MDC	DMS-250
PRI	PRI	PRI	PRI
	SS7	SS7	SS7
ESN	ESN	ESN	
ETN	ETN	ETN	ETN (limited availability)
ISDN AP (Meridian Link)	ISDN AP (Meridian Link)		
	FGD		FGD (EANTs)
			FGA (ONALs)
			FGB/C (ONATs)
		PVN	
		POTS	
		CENTREX	
		Centrex Data Service	
		ACD	
			DAL
			FXS DAL*
Analog/Digital PTS			PTS IMT*
			T100/T102 Test Lines
			OP250 Operator Center Tie Trunks

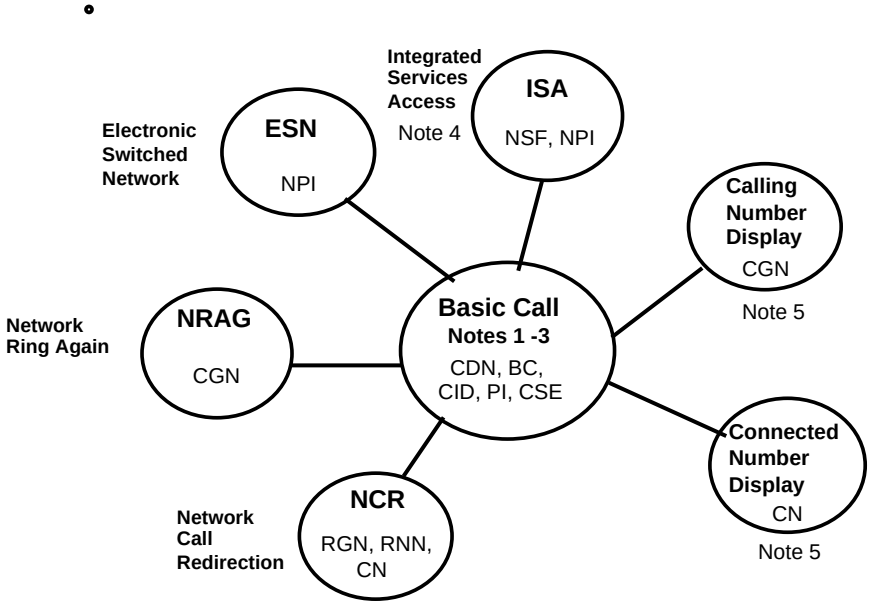
* Limited connectivity.

Network calling features

Information elements within call control messages enable other ISDN services. Figure 3 shows information elements (IEs) for ISDN features currently supported on PRI/SS7 trunk group types. Table 2 describes these message elements. Only PRI message elements are identified; similar IEs are used for SS7 call processing.

Note: If non-ISDN links are included, basic call provides call control functions only; no feature processing is available. Interaction with existing non-ISDN features is transparent.

Figure 3
PRI information elements for network features



Notes

1. PRI IEs used for basic call are defined in Table 2.
2. Message elements are derived from datafill parameters and collected digits (translations).
3. The Call Reference, Protocol Discriminator, and Message Type information elements are mandatory in all messages.
4. Also known as Call-by-Call service.
5. ISDN terminals or terminals with display are required for some features.

PRI information elements

PRI call control messages include the information elements (IEs) listed in Table 2. Figure 3 shows the IEs that associated with different calling features. The Call Reference, Protocol Discriminator, and Message Type information elements are mandatory in all messages.

- The Call Reference identifies messages associated with the call request at the local user-network interface (does not have end-to-end significance).
- The Protocol Discriminator distinguishes call control messages from other message types, such as maintenance messages.
- Message Type identifies the call message, such as setup or disconnect.

Information elements that deliver other ISDN services are described in detail in the Network Services Guide for that feature.

Table 2
PRI message elements

Element	Definition	Options	Comments
BC	**B**earer **C**apability defines the transmission characteristics associated with a call.	Speech (*Note 1*) 3.1 KHz 64 Kbps clear 64 Kbps restricted 56 Kbps	Voice Voiceband data B8ZS data ,64 Kbps B7 data, 56 Kbps (*Note 2*) DS-1 data, 56 Kbps
CDN	**C**alle**D** **N**umber		Used for routing.
TON	Type of Number	International, National, Local (DN), Unknown	
NPI	Numbering Plan Indicator	Public (E.164) or Private (ESN)	
IA5 Digits	Dialed Digits	0 through 9, * and #	
CID	**C**hannel **ID**		Identifies the PRI trunk. Must be coordinated with far end.
IID	The interface ID identifies the DS-1 span	2-15 (SL-1 only) or 0 to 31	In the SL-1, 0 is reserved for the D-channel; 1 is reserved for backup D.
Channel Number	Channel number on that DS-1	1-23 (SL-1 only) or 1 to 24	Channel 24 is reserved for the D-channel in SL-1.

PRI information elements (continued)

Table 2 (continued)
PRI message elements

Element	Definition	Options	Comments
PI	The **P**rogress **I**ndicator describes events than may affect call handling.	Call is not end-to-end ISDN.	Used when call originates or terminates on non-ISDN trunk.
		In-band information now available.	When call terminates to non-ISDN line, audible ringing or tones sent inband to originating PRI.
CSE	**C**au**SE**	See Cause tables in each switch section.	Identifies why a call cannot be completed or that there is an inband treatment, (such as busy).
NSF Service Selector Service ID	**N**etwork **S**pecific **F**acilities (used for ISA routing).	The Service Selector specifies the type of call service (FX, TIE, etc.). The Service ID selects a specific trunk facility.	The NSF explicitly identifies the network facilities requested for call routing. Applies to incoming and outgoing calls.
RGN	**R**edirectin**G N**umber	Includes TON, NAP, IA5 Digits, and reason for redirection.	Identifies the number invoking call redirection.
RNN	**R**edirectio**N N**umber	Includes TON, NAP, IA5 Digits, and reason for redirection.	Identifies the number to which call redirection is invoked.
TNS	**T**ransit **N**etwork **S**elector	To be supported in a later release.	The TNS requests a transit network, such as an IEC, for call routing.

Note 1:. All non-ISDN sets are assumed to have speech BC.

Note 2: Also referred to as AMI, ZCS, and inverted HDLC. With 64K restricted, the encoding scheme produces an effective data rate of 56 Kbps.

PRI interface characteristics

ISDN calls are processed using a sequence of call set up and release messages provided by the PRI interface. The message elements for routing and features as well as parameters for error control are configured as part of PRI installation.

> ***Note:*** Several interface and transmission parameters configured in datafill must be coordinated at the near end and far end during PRI installation.

The following sections summarize PRI interface characteristics. Not all of these characteristics apply to all equipment types.

B- and D-channel configuration

The PRI access structure is typically 23B + D, in which 23B, or "Bearer," channels are controlled by a D, or signaling, channel. Each channel occupies one timeslot on a DS-1 span. (A DS-1 span carries 24 channels.) The D-channel carries call control (or supervisory) information according to CCITT recommendation Q.931.

In non-associated signaling, nB+D, the B-channels are controlled by a D-channel on another DS-1 span. For nB+D, the DS-1 span for the B-channels must be appropriately identified across the PRI interface using the channel ID IE.

The B-channels are 56 Kbps or 64 Kbps trunks and can be used for any user information (voice or data). PRI trunks provide bidirectional, simultaneous digital transmission.

> ***Note:*** The 56 Kbps option is provided to accommodate all equipment types.

The B-channel trunk group is defined in software. A PRI trunk can carry voice calls or data calls, as defined in software.

Each B-channel can be used independently and simultaneously. The D-channel is also 56 or 64 Kbps. The datarate configured in software applies to the DS-1 span (both the D- and B-channels).

PRI interface characteristics (continued)

Backup D-channel (SL-1 to SL-1 only)

For reliability, a backup D-channel can be configured if the primary D-channel fails. The backup D-channel is configured in datafill.

Note: Backup D-channel will be provided in a later BCS for the SL-100, DMS-100, and DMS-250.

When a backup D-channel is configured, the system automatically switches to the backup D-channel when the D-channel fails. There is no interruption in service when call control is transferred to the backup D-channel.

If the primary D-channel recovers, the system can be configured to switch control back to the primary D-channel (SL-1 only). This option is configured in software..

Channel identifier

B-channels are uniquely identified using the channel identifier (CID) IE. The CID includes the interface identifier (IID), or DS-1 span, anD-channel number. The trunk group can contain multiple CIDs.

Note: The CIDs must be identical end-to-end or the call cannot be completed.

If the IID field is omitted, the receiving node assumes that the channel specified is on the same DS-1 as the associated D-channel.

B-channel allocation

For outgoing calls, the B-channel (DS-1 timeslot) is always identified by the originator and dedicated to that call. The switch selects the next idle member in the trunk group according to the search method defined in software and reserves it for that call. No B-channel negotiation is supported. The selected B-channel is identified in the call setup message using the CID IE.

Note: The channel ordering sequence for channel format D2 is different than that used for formats D3,D4, and ESF.

If all B-channels in the PRI are busy, the call is routed to the next trunk group in the route list.

For incoming calls, the network allocates the B-channel in the same manner.

PRI interface characteristics (continued)

User vs. network

In a PRI connection, one end functions as the *user* and the other end functions as the *network* for the exchange of call control messages. These parameters define the ends of the link for the local connection only--they do not have end-to-end significance. The user or network function is identified in software for the trunk group.

B-channel glare

Glare occurs when a call termination and origination occur simultaneously on a single trunk member. Opposite ends of a PRI connection should be datafilled to minimize glare. This is accomplished by opposite ends of the interface to allocate B-channels in a different selection sequence. This is configured in software

If a call collision occurs, that is, the *network* is terminating a call and a *user* selects the same B-channel to originate a call, the terminating call is allowed to proceed if the network is defined in software to "stand." If the network is datafilled to "yield," the originating call is allowed to proceed, and another member is selected for the terminating call or the call is rerouted.

If the user is originating a call and the network detects a call termination, the network selects another member to terminate the call regardless of the datafill.

Note 1: If the node is configured as the network for the PRI interface (see below), it should also be datafilled to "stand" for B-channel glare. If the node is configured as USER (see below), then it should also be datafilled to "yield." This is consistent with the PRI protocol (Q.931) standard.

Note 2: This does not apply to the SL-1. The SL-1 always yields to the connected switch, unless the connection is SL-1 to SL-1. In this instance, the SL-1 identified as "slave" in software always yields to the SL-1 identified as "master."

Cause information

A cause information element (CSE) is used to supply status or diagnostics messages during call processing. Cause information is provided for normal call processing events, such as normal disconnect, subscriber busy, or network congestion, and to indicate protocol errors or interworking. Cause is also provided when there is an inband treatment applied to a call.

Cause information is transparent to craftpersons and applies only to the DMS-100.

PRI interface characteristics (continued)

Call treatments

Note: This discussion of call treatments does not apply to SL-1.

Call treatments are inband tones or announcements (such as subscriber busy) applied during call processing.

When a call is routed to treatment, an attempt is made to map the treatment to a cause (CSE), with the following results:

- If the treatment can be mapped to a cause, then the PRI interface is sent a disconnect message with the CSE element. The CSE is pegged in the OMs.
- If the CSE cannot be mapped to a treatment (or if the call originator is not an ISDN node), then a default treatment is supplied inband to the originator.

The source of the treatment is determined as follows:

- The caller is supplied with an inband treatment from the local public network node or at the originating office, according to datafill.
- If the call is not end-to-end ISDN, then treatment is supplied at the node where interworking occurs.

DRAMs and RANs

The use of Digital Recorded Announcement Machines (DRAMs) or Recorded ANouncements (RANs) (SL-1 only) to provide announcements to PRI interfaces is fully supported. DRAMS may be used when specifying a route list or when specifying an announcement to be applied to a treatment.

PRI interface characteristics (continued)

Interworking with SS7 trunks

PRI provides the user-to-network interface to SS7 networks. PRI interworks with SS7 ISDN User Part (ISUP) trunks to provide a “backbone” for ISDN connections and services.

Note: SS7 connections are not supported for SL-1.

ISUP provides the signaling functions for switched voice and non-voice services in the SS7 network. (PRI uses Q.931 signaling protocol for call control.)

Note: Signaling System 7 (SS7) is the North American standard for Common Channel Signaling #7 (CCS7).

PRI/SS7 interworking maps the PRI messages to SS7 messages and PRI information elements to SS7 parameters. PRI/SS7 interworking is transparent to users.

Note: Not all messages are mapped; for example, none of the maintenance diagnostic messages are interworked.

In the case of interworking with SS7 trunks, the PRI node must supply the BC, CGN, and CDN.

- BC is mapped to the User Service Information element in SS7.
- The mapping of CGN is determined by the NPI. If the NPI =Private, then the ISUP field is coded to “subscriber number.” If NPI=Public, then the ISUP field is coded according to the number of digits as international, national, or subscriber.
- CDN mapping is generated by translation.

Interworking with non-ISDN trunks

PRI interworks with the following non-ISDN trunks: IBN trunks, POTS local trunks, EA IEC trunks, CAMA trunks, PBX trunks, and Intertoll trunks. If a call terminates to a non-ISDN trunk, a “call is not end-to-end ISDN” message is sent to the originating PRI, and the call proceeds as normal.

If interworking with non-ISDN links is required, basic call provides call control functions only; no ISDN feature processing is available. Interaction with existing non-ISDN features is transparent to users.

PRI interface characteristics (continued)

Warm SWACT

Note: This discussion of Warm SWACT does not apply to SL-1.

The Warm SWACT (SWitch ACTivity) capability allows the active ISP and MP in the DTCI to become inactive while the standby ISP and MP become active. If a fault occurs in the active unit, the standby unit take over full control. This provides full backup for the D-channel handler functions.

When a Warm SWACT is initiated, calls that are in the process of being established are lost. However, all existing calls in the active state (talking) are not affected. The maximum time required to re-establish the logical link so that calls can be processed is less than 200 msec.

A SWACT can also be initiated at the MAP with the command SWACT at the DTCI level of the MAP.

Basic call processing

ISDN calls are processed using a sequence of call setup and release messages provided by the PRI interface. The message elements for routing and features, as well as parameters for error control, are configured in datafill as part of PRI installation.

> ***Note:*** Several interface and transmission parameters configured in datafill must be coordinated at the near end and far end during PRI installation.

The following sections summarize call control procedures for basic call service. Not all of these characteristics apply to all equipment types.

Bearer capability

Bearer capability (BC) can be assigned to user terminals or to PRI trunks. For example, a 500/2500 set would be assigned a voice BC; an ISDN set may be assigned multiple services. A PRI trunk would be assigned a BC of voice or data.

When BC is assigned to a terminal, it defines the bearer services that can be accessed by a user. Each call is assigned a specific BC, which is sent out as part of the call setup message. There must be a BC associated with each call request. The BC assigned to the call is used by the terminating switch to ensure that calls are connected only between compatible terminals. This is called BC screening.

When a BC is assigned to a trunk, it defines the transmission characteristics associated with a call. BCs assigned to terminals must be compatible with the trunk route selected or the call will not be allowed to terminate to the trunk. Similarly, on tandem calls, the BCs of incoming trunks are screened to ensure their compatibility with the BCs of outgoing trunks. A trunk may be assigned multiple BCs.

> ***Note:*** The SL-1 performs limited line-to-trunk BC screening. See *BC screening* on the next page.

A set of default BCs are provided in software.

> ***Note 1:*** BC is service-changeable on the SL-100, DMS-100, and DMS-250, but not on the SL-1.

There are no new table parameters provided for assigning BCs in the SL-1. Table 2 in *PRI information elements* in this section summarizes the BCs supported for basic call processing.

> ***Note:*** The SL-1 supports all BCs on incoming calls, but assigns only three BCs to outgoing calls: speech, 64KC, or 56K.

Basic call processing (continued)

BC screening

Bearer capability screening can be implemented on three levels depending on switch type: station-to-station (DN-to-DN), line-to-trunk, and trunk-to-trunk.

> ***Note:*** BC screening is a network option for the SL-100, DMS-100, and the DMS-250., but not on the SL-1. BC screening is always performed by the SL-1 and is transparent to users for PRI calls. The SL-1 screens for voice and data compatibility only between terminal BCs. This screening capability is provided by the Class of Service (COS) assigned to user terminals.

When BC screening is implemented between originating and terminating DNs, the terminating switch screens all call requests to ensure the compatibility of the user terminals before the connection is completed. The BC in the setup message from the incoming call is checked against the BC assigned to the terminating DN. If software shows the terminals to be compatible, then the call is completed. If the BCs are not compatible, then the call is not completed, and the originator may be given call not accepted (CNAC) treatment.

On outgoing calls, the BC information is used to determine if a device with that BC can terminate to that PRI trunk group. For example, a device with a Speech BC is not compatible with a trunk configured for 64 Kbp Clear data. (If BC indicates a data call, no PADs are inserted.) If the call BC is compatible, it is passed to the outgoing call setup message. No BC screening is done for non-PRI trunks.

> ***Note:*** The SL-1 uses trunk BCs only to disallow 64K clear data calls over non-PRI trunks.

On tandem calls , calls originating on trunks configured with a particular BC will only be allowed to terminate to trunks with a compatible BC when BC screening is implemented.

BC compatibilities are provided in software

> ***Note 1:*** BC compatibilities are service-changeable on the SL-100, DMS-100, and DMS-250, but not on the SL-1.
>
> ***Note 2:*** ISDN terminals do not require this feature since they have the capability to screen incoming calls on the basis of information sent to them by the network.

Basic call processing (continued)

Routing

Two types of routing are available: dedicated trunk routing and Integrated Services Access (ISA), a call-by-call type service (see NTP 555-8001-102).

Note: This book describes dedicated trunk routing only.

Dedicated trunk routing for PRI ESN and POTS calls uses existing translations tables and routing procedures. A call type of Public or Private is associated with each incoming and outgoing call .

For all outgoing and incoming calls, the call type is obtained from the call setup message and is used select the appropriate translation and routing tables.

Incoming calls

For incoming calls, the switch looks at the CDN, which includes the Type of Number (TON), Numbering Plan Indicator (NPI), and called digits.

Note: The NSF IE, if included, applies only to ISA calls.

These elements are then mapped to a call type according to the following rules:

- If the NPI is specified, than call type=NPI (PUBLIC or PRIVATE).
- If there is no NPI, then the default for the call type is PUBLIC.

Note: If the dialed digits in the CDN include any prefix digits, they are translated to the appropriate NPI. The CDN may also include prefix digits for a Preferred InterLATA Carrier (10xxx) since the Transit Network Selector (TNS) is not supported.

The following call types are supported for incoming PRI calls:

SL-1	SL-100 or MDC	DMS-100	DMS-250
COT	PUB	PUB	PUB
DID	PVT	na	PVT
TIE	TIE	na	TIE
WAT	WATS	WATS	WATS
FEX	FX	FX	FX (from SL-1 only)
		na	INWATS (from SL-1 only)

PVT (from DMS-250)

Note that not all call types for incoming calls are supported by all switches.

Basic call processing (continued)

For calls incoming to the SL-1, existing translations and routing apply. TIE calls are treated as Private calls; all other call types are treated as Public calls.

Table 3 summarizes incoming call processing and routing combinations for the SL-100, DMS-100, and DMS-250.

Table 3
PRI routing for incoming calls (SL-100, DMS-100, DMS-250)

IE	Call Type	Dialing Plan	XLARTSEL	Comments
NSF	FX TIE INWATS	The NSF is used for ISA routing. See ISA Network services guide (NTP 555-8001-102).		
NPI	PRIVATE	ESN or ETN	XLAIBN	PBX or MDC
			RTEREF table name	Direct routing--no translation but may require digit manipulation (e.g., WATS or FX application)
			XLAIEC (DMS-250 only)	References CALLATTR table
	PUBLIC	standard E.164	XLALEC	POTS translations; references LINEATTR table
			RTEREF table name	Direct routing--no translation but may require digit manipulation (e.g., WATS application)
			XLAIEC (DMS-250 only)	References CALLATTR table.

Basic call processing (continued)

Outgoing calls

The following call types are supported for outgoing calls:

SL-1	SL-100 or MDC	DMS-100	DMS-250
COT	PUB	PUB	PUB
DID	PVT	na	PVT
TIE	TIE	na	TIE
WAT	WATS	WATS	
FEX	FX	FX	FX
		na	INWATS

PVT (to DMS-250 only)

Note that not all call types for outgoing calls are supported by all switches.

On outgoing calls, the setup message incorporates the TON, NPI, and call digits in the CDN. The BC is also included (see *Bearer capability screening* in this section).

In the SL-1, the ISDN route and trunk type for the call type are configured in the customer database. Normal translations and routing apply. The facility selected determines the route for the call. TIE calls are treated as Private calls; all other call types are treated as Public calls.

In the SL-100, DMS-100, and DMS-250, calls are translated and routed according to standard routing selectors. Dialed digits are collected and translated according to datafill. The translations tables index the appropriate routing table, which references the trunk group CLLI (or ISA is specified for call-by-call routing; see NTP 555-8001-102). The CLLI table indexes table TRKGRP to obtain the LTID, which is then used to access the service tables.

A call type is defined for each route (trunk LTID) in table LTCALLS. The call type maps to the NPI for the setup message for the outgoing call. The translation attributes are obtained from XLARTE in LTCALLS and the translated digits are added to the CDN IE for the outgoing setup message.

Note: All digits must be present before sending the setup message.

Table 4 summarizes valid routing combinations for PRI routing on outgoing calls for the SL-100, DMS-100, and DMS-250..

Note that the only valid call types for dedicated trunk routing are:

- PRIVATE with an NPI of PRIVATE and nil NSF.
- PUBLIC with PUBLIC NPI and nil NSF.

Basic call processing (continued)

Table 4
PRI routing for outgoing calls (SL-100, DMS-100, DMS-250)

CALLTYPE	NPI	NSF *(Note 1)*	XLARTE	Comments
PRIVATE (PBX to PBX)	PRIVATE (PBX to PBX) *(Note 2)*	nil	XLAIBN or RTEREF	Private dialing plan over a direct PBX-PBX connection.
	PRIVATE	PRIVATE (ISA only)	XLAIBN or RTEREF	Private dialing over private facilities.
	PUBLIC *(Note 4)*	PRIVATE (ISA only)	XLAIBN or RTEREF	E.164 dialing over private facilities.
PUBLIC	PUBLIC *(note 3)*	nil	XLAIBN, XLALEC, XLAIEC (DMS-250 only) or RTEREF, such as IBNRTE.	E.164 dialing over public network facilities (PSTN).
TIE	PRIVATE	TIE (ISA only)	XLAIBN or RTEREF	Private dialing plan over CO-provided facilities. The FACNUM is ignored.
WATS	PUBLIC	WATS (ISA only)	XLAIBN, XLALEC, XLAIEC (DMS-250 only) or RTEREF, such as IBNRTE.	A zone number can be specified or auto zoning can occur.
FX	PUBLIC	FX (ISA only)	XLALEC or RTEREF	The FACNUM is ignored.

Note 1: The call type maps to an NSF for ISA calls only.

Note 2: When call type = PRIVATE, the dial plan is determined by the translations datafill. Calls can be routed over the private network with overflow to the public network as configured in datafill.

Note 3: The NPI is not included in the setup message for PUBLIC calls. If no NPI is specified in an incoming call, the default call type is PUBLIC.

Note 4: When an ISA selector is specified and CALLTYPE = PUBLIC, an NPI field with options PVT or PUB is required.

Basic call processing (continued)

Tandem calls

In a PRI-to-PRI tandem call, the CGN of the originating call is delivered to the outgoing route.

ESN calls

There are various types of dialing plans that can be defined for a network. Electronic Switched Network (ESN) is one type of dialing plan traditionally used for Northern Telecom private networks. PRI supports all PBX/Centrex ESN features for ISDN networking or provides identical features in MCDN calling services. ESN calling is supported over private or CO-provided facilities.

ESN signaling is enabled in the CDN. The CDN includes the call type, call subtype, and TNCOS or TCOS in addition to the standard IE fields. Based on these values and the existing translations capabilities in the switch, the call is routed according to its COS.

ESN is implemented on PRI links by configuring the trunk type as TIE. (in SL-1 only) or the calltype (NPI) as PRIVATE in the database.

Calls are processed using standard ESN call processing procedures. The user dials the access code, location code, and extension number. The access code is removed, and the NPI is set to private. The node then appends the NCOS to the digits in the CDN for routing within the private network. Incoming calls use the NCOS and destination digits to terminate to the desired station.

> ***Note:*** For compatibility with existing ESN facilities, ESN call processing uses inband call control and DTMF digit collection.

Because ESN-related information is included with the CDN, ESN signaling is also supported by SS7 links.

ETN compatibility

ESN is compatible with Electronic Tandem Network (ETN) dialing. ETN is a type of private network dialing plan. ETN calls are processed identically to ESN calls, except that a TCOS is appended to the outgoing CDN and for incoming calls, the PRI changes the TCOS to an NCOS.

When NCOS information that includes Traveling Class of Service (TCOS) information is received, a NT switch can provide access to AT&T's Electronic Tandem Network (ETN). The NCOS and TCOS class of service can be used interchangeably as long as the NCOS assignments are uniform throughout the network.

Basic call processing (continued)

Data calls

A data call is a normal call over PRI (using standard PRI signaling) with a BC of 56 or 64 Kbps. Voiceband data calls (with modems) are assigned a BC of 3.1 KHz.

Note: 64 Kbps calls will not terminate to 56 Kbps trunks, but 56 Kbps calls will terminate to 64 Kbps or 56 Kbps trunks.

All data calls over a PRI B-channel are transported with bit transparency by removing the PADs associated with the PRI trunk.

Note: 64KC tandem data call has to switch to voice PAD with 00 value.

The following data devices are supported: Asynchronous Interface Module (AIM), AILU, Low Speed Data Unit (LSDU), and High Speed Data Unit (HSDU).

Call authorization

In the DMS-250, each call originating over a PRI interface is associated with an authcode. Call authorization on the DMS-250 is performed against four characteristics: Authcodes, Personal Identification Number (PIN) digits, Account Codes, and Calling Line ID. The valid authcodes for a call type are provided in datafill.

In the Sl-1, authcodes include network authcodes and basic authcodes,

ESN signaling

ESN signaling is supported for PRI and SS7 links in addition to traditional private line links between PBX and Centrex offices.

ESN feature support

The following ESN services are provided over ISDN PRI:

- Call back queuing
- Coordinated dialing plan
- ESN route selection
- Network authorization codes
- Network call detail recording (CDR) or station message detail recording (SMDR)
- Network control signaling
- Network speed call
- Network traffic and operational measurements
- Off-hook queuing
- Priority queuing

The features provided only on the Meridian SL-1 are as follows:

- Coordinated call-back queuing
- Call-back queuing to conventional main
- Network call transfer

Requirements

There are special datafill requirements for ESN signaling for the SL-100 and DMS-100 when connected to an SL-1. Tables PACMAN, COSMAP, and COSDATA must be datafilled to accommodate ESN digits incoming from the SL-1, and table DIGMAN must be datafilled for calls outgoing to the SL-1. These considerations apply only to BCS 30.

Restrictions

The DMS-250 provides limited support of ESN signaling in private networking applications. See ESN Implementation in the DMS-250 section.

Meridian 1/SL-1

Basic call service is supported by the following Meridian 1/SL-1 network configurations:

- SL-1 «» SL-1
- SL-1 «» SL-100
- SL-1 «» DMS-100 /Meridian Digital Centrex
- SL-1 «» DMS-250
- SL-1 «» AT&T #4ESS

ESN signaling is supported by the following Meridian 1/SL-1 network configurations:

- SL-1 «» SL-1
- SL-1 «» SL-100
- SL-1 «» DMS-100

This section documents X11 Release 15 for the SL-1 and BCS 30 for the SL-100, DMS-100, and DMS-250.

In this document, the Meridian 1/SL-1 product is referred to as SL-1 to facilitate searching in COMPASS.

Engineering planning SL-1 network options

The SL-1 supports only Primary Rate Interface (PRI) links for ISDN networks. A *link* includes the signaling link and associated trunks. Table 5 provides a summary of the SL-1 network options for basic call.

- PRI links use a message-based, common channel signaling protocol, 23B + D. Call control signaling (Q.931) is provided by the D-channel; the B-channels serve as voice/data trunks. The B and D-channels are carried on the PRI interface on one or more DS-1 spans (also called T1 spans).
- Integrated Services Access (ISA) links combine PRI signaling with routing parameters from the PRI database so that multiple call types can be carried by a single trunk. ISA is a routing application on a PRI link.
- ISL links add an out-of-band D-channel to existing analog (ATI) or digital (DTI) trunk facilities for a PRI-like interface, providing ISDN features and faster connections over non-ISDN trunks. In shared (SHA) mode, the D-channel supports both PRI and ISL trunks. In dedicated (ISLD) mode, the D-channel supports ISL trunks only.

Table 5
SL-1 ISDN network options

Trunk	PRI	ISA	ISL *(notes 1-2)*
DCH Mode	PRI	PRI	ISLD or SHA
Restrictions	none	Not available on SL-1«»SL-1.	TIE trunk (SL-1 to SL-1 only)
X11 Software	Release 13 min	Release 13 min	Release 13 min
Capacity (Varies by system type, see the *Data Engineering Guide*.)	Up to 16 DS-1 spans (1D +383B) Min: 1D +23B Max: 1D + 383B *(note 3)* D-channel: 1 min to 8 max B-channel: 1 min to 383 max		Up to 16 ISL links **SHA mode** Min:1D +1B +1 ISL Max: 1D + 383B or ISL **ISLD mode** Min:1D +1 ISL Max: 1D + 383 ISL (for DTI) Max: 1D +nISL (for ATI) *(note 4)*
ESN support	yes	yes	yes

Note 1: ISL supports Calling Line ID (CLID), CLID in CDR, ESN, Network Ring Again, and Network Call Redirection.

Note 2: ISL is not the same as inband ANI (also called digital inband, PTS trunks, or T1 with AB signaling), which is non-D-channel.

Note 3: One D-channel supports up to 383 B-channels. However, for reliability, a ratio of 1 D:47B is recommended. A backup D-channel capability is available for SL-1 to SL-1 PRI or ISL.

Note 4: The maximum number (n) of ISL trunks that can be supported is a function of the signaling data rate (2400 to 6400 bps). At 2400 baud, the maximum is 100.

PRI interface considerations

Basic call is configured as part of PRI interface installation. Table 6 lists PRI interface requirements and networking considerations and provides a brief overview database implementation

- Refer to ISA Network Services Guide (NTP 555-8001-102) for the database parameters associated with ISA.
- Refer to the *PRI Interface* section in the *Overview* section for a general description of PRI interface characteristics.

Table 6
SL-1 PRI interface considerations

Mode	PRI	SHA	ISLD
Feature Packages	PRA, ISDN. IEC is required for DMS-250 or ESS#4 connection.	ISDN, ISL, PRA	ISDN, ISL, PRA
Implementation	D-channel signaling is provided by the DCHI card. The PRI card provides the DS-1 link, which is synched to an external clock.	Requires a PRI interface with an active D-channel.	D-channel signaling is provided by a dedicated connection via a dedicated leased line, dial-up modem, or DTI trunk.
Requirements	For 64 Kbps clear end to end, all repeaters and DS-1 interfaces must be set to B8ZS.	The QPC720 pack is not required to implement ISL. For ISLD operation, external clock (CLOK in LD17) requires a modem or ASIM. The HSDM is required for ISL SHA.. Channel IDs (see *SL-1 Database*) must match at the endpoints.	
Networking Considerations	The D-channel occupies channel 24 on the DS-1 link. A DS-1 span can carry only one D-channel. Backup D-channel is only available for SL-1 «» SL-1 PRI links. Compression is not allowed on D-channels implemented over existing T1 networks (T1 multiplexers).	Does not require a B-channel on the PRI. Must be configured as TIE. This is the only trunk type allowed for an SL-1 to SL-1 link. With auto recovery, when the D-channel fails, ISL-configured trunks automatically revert to inband trunk signaling (Release 14 and later). Backup D-channel is available for ISL links. Compression is not allowed on D-channels implemented over existing T1 networks (T1 multiplexers).	

PRI interface considerations (continued)

Table 6 (continued)
SL-1 PRI interface considerations

Database Configuration (see *SL-1 Database*)	The D-channel mode is identified in LD17, prompt USR); the D-channel is associated with the trunk group in LD17, prompt PRI.	ISL trunks are enabled on a per trunk group basis. • The D-channel type is identified in LD17, USR. • The ISL trunks are assigned a channel ID (CHID) in LD14 for the trunk group.

Basic call service considerations

Table 7 lists basic call service requirements and networking considerations and provides a brief overview of datafill for basic call service service on the SL-1.

- Refer to the *Call Processing* section in the *Overview* for a general description of basic call processing on PRI links.

Table 7
SL-1 basic call service considerations

Link	PRI
Feature Packages	Requires ISDN PRI feature packages only.
Implementation	Basic call is configured as part of PRI installation. Bearer capability screening uses the CLS (VCE or DTA) assigned to the SL-1 set in LD11. There is no BC screening for the route or trunk, except that data calls with a BC=64KC are not allowed over non-PRI trunks.
Requirements	SL-1 «» DMS-100 links require a uniform dialing plan (CDP or NARS) configured on the SL-1.
Networking Considerations	Route selection should be set up to select the PRI trunk first with overflow re-routing to the non-PRI trunks. The SL-1 supports the following BC for incoming calls: Speech, 3.1 KHz, 64KC, 64KR, 56K. For outgoing calls, the SL-1 assigns BCs of Speech, 64KC or 56K. Outgoing data calls (CLS=DTA) are 56K unless the unit is QMT21 (HSDU) and is set for 64K clear, then BC = 64KC. All outgoing voice calls are assigned a BC of Speech. Incoming calls with a BC of Speech or 3.1 KHz must terminate to a voice terminal (CLS=VCE). Incoming calls with a BC of 64KC, 64KR, and 56K must terminate on a terminal with CLS=DTA. Data calls with a BC=64KC are not allowed over non-PRI trunks.
Database Configuration for Basic Call (see *SL-1 Database)*	Basic call is configured as part of PRI installation. There is no datafill for bearer capability; this is handled transparently by the switch.
Feature Interactions	None

ESN signaling considerations

ESN signaling is offered as part of the basic call service. Table 8 provides an overview of the SL-1 requirements for implementing ESN signaling on PRI links.

Table 8
SL-1 ESN signaling considerations

X11 Software	Release 1 minimum
Feature Packages	No new options are required for ISDN networking.
Implementation	ESN-dialed numbers are translated by parameters entered in overlays 15, 16, and 86. These parameters must be coordinated with the far end so that the call type is correctly translated at each end.
Requirements	None additional.
Networking Considerations	ESN signaling in ISDN networks is supported by both PRI and ISL links. ISL supports the same ESN features PRI supports.
Database Configuration for ESN (see *SL-1 Database*)	ESN is implemented on PRI links by configuring the trunk type as TIE in LD16 and LD14 and specifying ESN = Y(LD16). Call types for outgoing ESN calls are assigned automatically and modified as specified in LD90. This call type must be recognized by the far end switch. Incoming ESN calls must be correctly translated by the receiving switch. The appropriate NARS or BARS access codes are inserted as required (these options apply only to TIE trunk calls): • when the digit insertion option, INST, in LD16 is enabled; • when the INAC prompt in LD16 is enabled for NARS/BARS routing (the digit insertion option is then bypassed). The AC2 prompt in LD15 maps the incoming call type to the appropriate translator based on the type of number (TON) information element in the PRI message flow.

ESN feature support

Table 9 lists the ESN features supported in Release 15.

Table 9
SL-1 ESN feature support

Network class of service	
Network control: NCOS and TCOS *(Note 1)*	
Network Automatic Route Selection (NARS)	
NARS access codes	Digit manipulation
Uniform dialing plan	Auto on-net to off-net overflow
Time of day routing	Automatic least cost routing
Network routing controls	Network speed call
Satellite link control	Automatic OCC access
Digit screening	Expensive route warning tone
ESN queuing	
Off-hook queueing	
Network authorization codes	
Coordinated dialing plan for up to 10 digits	
The following ESN features will be provided in a later Release: • Network queueing: coordinated call-back queueing and coordinated call-back queueing to conventional main. • Network call transfer	
Note 1: When NCOS information that includes Traveling Class of Service (TCOS) information is sent to a DMS-100, the DMS switch can provide access to AT&T's Electronic Tandem Network (ETN). The NCOS and TCOS class of service can be used interchangeably as long as the NCOS assignments are uniform throughout the network.	

Software requirements

Table 10 shows the software dependencies for basic call service. ESN requires no new options for ISDN networking.

Table 10
Meridian SL-1 basic call and ESN feature packages (Release 15 and later)

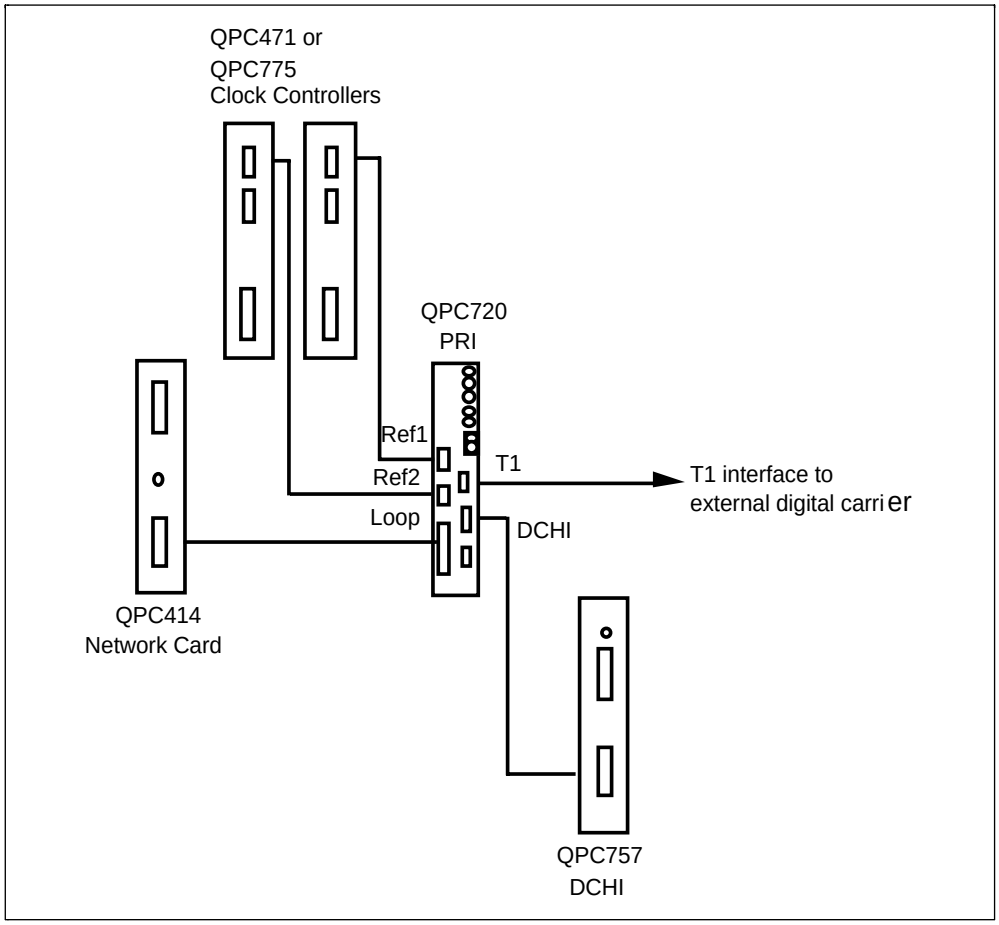
Basic Call		
SW0000A	Base package	• Includes PBX interface (PBXI) for DTI/CPI (Option 75).
SW0300A ISDN (Option 145 and 118)	Basic ISDN features	• Requires base package • Includes ISDN signaling, calling line ID (CLID), and CLID in CDR.
SW0301A PRA (Option 146)	ISDN primary rate access	• Provides basic call on PRI and ESN signaling on PRI • Requires base package and SW0300A.
SW0302A ISL (Option 147)	ISDN signaling link	• Requires base package and SW0300A.for dedicated mode. • Also requires SW0301A for shared mode.
SW0304A IEC (Option 149)	Inter-exchange carrier	• Requires SW0301A. • Required with DMS-250 and AT&T #4ESS connection
SW0305A CBC (Option 117)	Call-by-call service	• Refer to *ISA Network Services Guide* (NTP 555-8001-102).

Hardware requirements

Figure 4 shows the basic hardware architecture for PRI links.

- For ISL SHA operation, the configuration is the same as below with the D-channel also supporting ISL (DTI or ATI) trunks.
- For ISLD operation, a dedicated data connection (ATI, DTI, or PRI) and DCHI is required for D-channel signaling. The DCHI is dedicated to ISL use. The D-channel communicates with the far end by means of a dedicated leased line, dial-up modem, or DTI trunk. (See NTP 553-2901-200 for details.)
- For additional information, refer to *ISDN product description* (NTP 553-2901-100).

Figure 4
SL-1 PRI hardware configuration



Hardware requirements (continued)

Table 11 shows the important hardware requirements for PRI links.

Additional hardware or ROM may be required depending on your system configuration, such as channel service unit (CSU), echo canceller (satellite transmission), X.25 packet assembler/disassembler (PAD), and QMT21 high-speed data module (HSDM). Refer to *SL-1 PRI/DCHI installation* (NTP 553-2901-200) for a detailed list of requirements, including cabling.

Table 11
SL-1 PRI and ISL hardware description

Card	Abbreviation	PEC	Comments
D-Channel Interface	DCHI	QPC757D	• Only one DCHI per PRI card. • Up to 8 DCHI cards allowed. One D-channel port (J2) per card. • Port # switch settings must match DCHI in LD17. • Set jumpers for high or low speed (ISL).
Primary Rate Interface (DS-1 span) *(Note 1)*	PRI	QPC720B	Each PRI provides 24 channels. Up to 16 cards per D-channel (DCHI).
Clock Controller *(Note 2)*	CC	QPC471 or QPC775	Release 15 or later requires vintage B. Canada and International only.
Network Card	n/a	QPC414	One network loop per PRI card.
4-wire E&M tie trunk	n/a	QPC237	**ISL only.**
High-speed Data Module	HSDM	QMT21	**ISL only.** Required for DTI 64K Clear data. Requires B8ZS line coding on PRI in LD17. Replaces ASIM and ADM in Release 15 *(note 3)*.

Note 1: Because PRI is T1-compatible, QPC720 can also be used for DTI applications (Release 5 and up). However, with extended superframe format (ESF) PRI and DTI, Release 13 (minimum) is required.

Note 2: The QPC471 and QPC775 clock controllers cannot be mixed in one system.

Note 3: The ISLD link requires ASIM or HSDM with DTI.

Installation rules

There are no special installation rules for basic call service at the network level.

- For installing PRI interface hardware, refer to PRI/DCHI installation (NTP 553-2901-200).
- For configuring the customer database, refer to *SL-1 database* on the following pages.

Important installation considerations

The following installation considerations apply:

- Either the DCHI or PRI card may be installed first. However, PRI loops must be configured in software before defining D-channel association.
- Use LD96 to enable the DCHI after it is installed with the command: ENL DCHI n (where n equals the number of the DCHI).

SL-1 database PRI datafill considerations

The following tables show the database parameters associated with configuring PRI, ISL, and ESN capabilities.

- The PRI interface datafill dependencies are listed in table 13.
- Correlation tables show the parameters that must be coordinated with the far end for network service. See *Correlation Tables.*
- These tables describe datafill for dedicated trunking only. To configure ISA on the PRI link, refer to the ISA Network Services Guide (NTP 555-8001-102).

  Refer to *the X11 I/O Guide* (553-3001-400) for a complete list of SL-1 ISDN database and applications parameters.

Datafill presentation

In the following datafill tables, defaults are presented in **boldface**. Not all fields in a table may be shown. Only those fields important to PRI, ISL, basic call service, or ESN signaling are presented. Prompts in lower case mark the end of sections of prompts that are not relevant to these capabilities.

Important datafill considerations

The following datafill considerations apply:

- PRI loops must be configured in software before defining D-channel association.

Datafill sequence

Table 12 summarizes datafill sequence for installing the PRI interface.

- To configure PRI or ISL links, datafill the SL-1 overlays in the following sequence.
- To configure ISA, refer to the *ISA Service Guide* (NTP 555-8001-102).

Table 12
SL-1 PRI datafill sequence

		Initial install
1. LD73 (DDB)	Set error detection thresholds and clock synchronization control.	X
2. LD15 (CDB)	Equip customers with PRI capability	X
3. LD17 (CFN)	Configure all PRI loops (DS-1 spans) before associating the D-channel	X
4. LD17 (CFN)	Add the associated D-channel (DCHI card) and configure the D-channel link	X
5. LD16 (RDB)	Configure PRI routes	X
7. LD14	Configure PRI trunks (B-channels)	X
5. LD86 (DGT)	Add ESN dialing capability (if you do not require ESN, skip this step)	OPT

LD73

Step 1: LD73 (DDB) Set maintenance thresholds and clock control for PRI loop.

Note: See *SL-1 Maintenance* section for associated alarm and status messages.

Prompt	Options	Description	Requirements	Comments
PREF	0-159 or **<cr>**	primary clock or free run		
SREF	0-159 or **<cr>**	secondary clock or free run		Appears if PREF= 0-159.
TRSH	0-15	reference #	Match TRSH in LD17 on DLOP	
RALM	1-**3**-128	yellow alarm 24-hr out-of-service limit	Must be enabled in LD60.	Service must be manually restored
BIPC	0-**2**-128	24-hr limit for times returned to service	Uses BIPV out-of-service limit	0 restores service automatically
LFAC	0-**3-**128	24-hr limit for times returned to service	Uses LFAL out-of-service limit	0 restores service automatically
BIPV	1-**3**-4 1-**2**-4	bit error rate main-tenance and out-of-service limits (BPV and CRC)	1=>10K in 6.6 sec 2=>10K in 66 sec 3=>10K in 660 sec 4=>10K in 6600 sec	
SRTK	1-**5**-24 1-**30**-360	slip count (tracking) maintenance and out-of-service limits		Appears if PREF=0-159. Service must be manually restored
SRNT	1-**15-**1024 1-**3-**1024	slip rate (free run) maintenance and out-of-service limits (time, in secs, for 10 slips)		Appears if PREF = <cr>. If AUTO = NO, service must be manually restored
LFAL	1-**17**-10240 1-**511**-10240	loss of frame align-ment main-tenance and out-of-service limits (daily count)		If condition clears for 15 secs, service is automatically restored.

LD15

Step 2: LD15 (CDB) Define PRI customer.

Prompt	Options	Description	Requirements	Comments
CUST	0-31			
...awu	<cr>			
ISDN	YES	change ISDN parameters		
PNI	1-32700	customer private network identifier	Must be unique. Must be the same through-out the network. Must match PNI in RDB (LD16)	Prompted if ISDN=Y in LD17 and at least 1 PRI link is configured.
HNPA	100-999	area code for your SL-1		
HNXX	100-999	CO prefix (exchange) for your SL-1		
HLOC	100-999	home location code (NARS)		
LSC	1-9999 or <cr>	1- to 4-digit local steering code in coordinate dialing plan (CDP). Press <cr> to transmit CDP DN.		Appears only if user has a 5- or 6-digit dialing plan.
CNTP	LDN or **PDN**	Select customer's listed DN or the set's prime DN as default for CLID		Attendant consoles can have only a LDN.
RCNT	0-**5**	maximum internode hops in a network redirection call	Enter 0 to disallow network redirection; otherwise,enter a number greater than 0.	The RCNT prompt is only checked for redirected calls when LD15 prompt ISDN is Yes.

LD15 (continued)

Step 2: LD15 (CDB) (continued)

Prompt	Options	Description	Requirements	Comments
AC2	aaa =	Call types that use access code 2.		Appear only when ISDN=Y and NARS is installed. Multiple responses are permitted. If a call type is not entered here, it automatically defaults to access code 1.
	NPA	E.164 national		
	NXX	E.164 subscriber		
	INTL	international		
	SPN	special number		
	LOC	location code		

LD17

Step 3: LD17 (CFN) Configure PRI network loops.

Prompt	Options	Description	Requirements	Comments
PWD2	**<cr>**			
ISDN	**<cr>**			
PARM	**<cr>**			
CEQU	YES	**IMPORTANT: You must configure all PRI network loops before associating the D-channel for those loops (step 4).**		
...xct				
DLOP	lll dd ff lll = 0-159 dd = 0 ff= D2-**D3**-D4-ESF	lll= network loop# dd= # of data calls ff=frame format	dd=0 for PRI. Bearer capability (voice or data) is handled by basic PRI. No additional parameters need to be configured.	See PRI *datafill dependencies*, table 13.
MODE	PRI			No default.
LCMT	**B8S** or AMI	AMI=B7 (or ZCS) B8S=B8ZS	Use B8S for SL-1 to SL-1. AMI requires 56K for DRAT. B8S requires 64KC for DRAT.	See PRI *datafill dependencies*, table 13.
YALM	**FDL** or DG2	facility data link (FDL) or digit 2 (DG2) yellow alarm signaling	Use FDL with ESF in U.S.; use DG2 with ESF in Canada.	Prompted only when frame format is ESF. If not prompted, DG2 was set.
TRSH	0-15	PRI threshold set	Same as TRSH, LD73.	
DTIC	0-159	starting network loop card slot for PRI	The loop# must be even.	Do not input loop numbers that take the system out of bounds.

LD17 (continued)

Step 4: LD17 (CFN) Add DCHI and configure D-channel link.

Prompt	Options	Description	Requirements	Comments
PWD2	**<cr>**			
ISDN	YES	**IMPORTANT: You must configure all PRI network loops before associating the D-channel for those loops**		
DCHI	1-15	I/O port address of DCHI card (J2) for primary D-channel	Must match switch settings on DCHI card	J2 is always odd.
BCHI	1-15	I/O port address of DCHI card (J2) for backup D-channel	Must match switch settings on DCHI card	J2 is always odd.
USR	PRA-ISLD-SHA	D-channel signaling mode		No default.
RCVP	**NO** or YES	recovery to backup D (N) or primary D when primary re-established (Y)	If this does not match the far end, both sides default to NO.	
ISLM	1-382	count of ISL trunks controlled by the D-channel		Prompted if MODE=ISLD or SHA.
DCHL	0-159	network loop for primary D-channel	You must configure all PRI network loops served by the D-channel first.	Not prompted if USR=ISLD (the D-channel does not require a PRI channel.
BCHL	0-159	network loop for backup D-channel	You must configure all PRI network loops served by the D-channel first.	Not prompted if USR=ISLD.
OTBF	1-**16**-127	# of output request buffers		
DRAT	**56K**-**64KC**-64KI	D-channel transmission rate: 56 Kbps (56K), 64 Kbps clear (64KC), or 64 Kbps restricted, inverted HDLC (64KI).	Must match the far end.	56K is the default when LCMT=AMI. 64KC is the default when LCMT=B8S

LD17 (continued)

Step 4 (continued): LD17 (CFN) Add DCHI and D-channel link.

Prompt	Options	Description	Requirements	Comments
PRI	lll xx lll= 0-159 xx=2 -15	lll=network loop for primary D-channel xx= interface ID for identifying multiple DS-1s per trunk group	Same as DCHL. Must match the far end. A unique xx must be used for each DS-1.	0 (primary D) and 1 (backup D) are assigned automatically for field xx. Not prompted if USR=ISLD.
IFC	**D100**-ESS4-SL1-S100 - D250	near end node		
SIDE	MAS or **SLAV**	identify controlling side for channel allocation in case of all collisions	MAS allocates channels in ascending sequence (1 to 24). SLAV allocates in descending sequence (24 to 1).	Prompted if IFC=SL1.
RLS	xx	Release ID for the D-channel for network features NRAG, NMS-MC, or NACD	Enter a 1. This applies to SL-1, SL-100, DMS-100, DMS-250, and AT&T.	These features are described in separate Network Service Guides.
CLOK	**EXT** or INT	D-channel clock	Use INT for DCHI loopback testing only	See *PRA maintenance* (NTP 553-2901-500)
LAPD	**NO** or YES	Change LAPD parameters (Y) or use defaults(N) for timers T23 through K.		Refer to NTP 553-3001-400 for associated error messages.
T23	1-**20**-31	Interface guard timer (timeout for DCHI response to system)	Enter in 1/2 sec units (e.g., 20=10 secs)	Appears if LAPD = Y See *Maintenance, Status Messages.*

LD17 (continued)

Step 4 (continued): LD17 (CFN) Add DCHI and D-channel link.

Prompt	Options	Description	Requirements	Comments
T200	2-**3**-40	re-transmission timer	Enter in 1/2-second units.	Appears if LAPD = Y.
N200	1-**3**-8	Maximum # of transmissions		Appears if LAPD = Y.
N201	4-**260**	maximum # of octets in information field		Appears if LAPD = Y.
T203	2-**10**-40	maximum time (secs) allowed without frame exchange	Release 15 requires a non-zero value.	Appears if LAPD = Y.
K	1-**7-**32	maximum # of NAKS (unacknowledged or outstanding frames)		Appears if LAPD = Y.

LD16

Step 5: LD16 (RDB) Configure PRI routes.

Prompt	Options	Description	Requirements	Comments
CUST	0-99	customer #		
ROUT	0-127 or 0-511	route #: 0-511 for system options NT, RT, ST, XT, 21, 51, 61,and 71; 0-127 all others		Route 31 is no longer reserved for private route (Release 14 and later).
TKTP	COT-FEX-WAT, DID-TIE-ISA	ISDN route being configured	TIE is required for SL-1 to SL-1 (PRI or ISL mode)	Only TIE appears if USR=ISLD or SHA in LD17. Refer to ISA service guide (NTP 555-8001-102) for configuring ISA routes.
...rcls				
DTRK	**NO** or YES	analog (N) or digital (Y) trunk		
DGTP	DTI or PRI	digital trunk type	Use DTI for ISLD only.	Prompted if DTRK=Y.
ISDN	YES	ISDN customer		Prompted if PRA=Y in LD15.
MODE	PRA or ISLD	mode of D-channel that controls the ISA route	Use PRA for ISL SHA.	No default. Prompted if TKTP=ISA. See ISA service guide (NTP 555-8001-102) for configuring ISA routes.
DCHI	1-15	DCHI port number	Must match DCHI in LD17.	Prompted only when MODE=ISLD.

LD16 (continued)

Step 5: LD16 (RDB) Configure PRI routes (continued).

Prompt	Options	Description	Requirements	Comments
PNI	1-32700	customer private network identifier	Must be unique. Must be the same throughout the network. Must match PNI in CDB (LD15)	Prompted if ISDN=Y in LD17 and at least 1 PRI link is configured.
IFC	**D100**-ESS4-SL1-S100-D250	near end node	Same as IFC in LD17	
SRVC	ACC-SDN-M800-MEG	service type for AT&T #4ESS connection: Accunet data service (ACC), switched digital network (SDN), MEGACOM 800 service (M800), or Megawats (MEG).	Requires TKTP=TIE.	Prompted if IFC=ESS4.
NCNA	**No** or Yes	Network call name allowed		
NCRD	**No** or Yes	allow (Y) network call redirection message (including CLID) or disallow (N)		
CHTY	**ABCH** or BCH	D-channel (BCH) or AB bit signaling (ABCH) for B-channels	Use BCH for PRI or ISL trunks. ABCH is used for DTI.	Prompted if DTRK=Y.

LD16 (continued)

Step 5 (continued): LD16 (RDB).

Prompt	Options	Description	Requirements	Comments
CTYP	UKWN-INTL-NPA-NXX-LOC-CDP-SPN	identifies call type for ESN access code insertion at receiving switch: unknown (UKWN), international # (INTL), national # (NPA), subscriber # (NXX), location code (LOC), coordinated dialing plan (CDP), or special # other than international format (SPN)		Prompted if TKTP = TIE. Applies only to direct dialing using trunk access codes (not NARS or BARS dialing).
INAC	**NO** or YES	insert access code to incoming ESN call from a private network.		Prompted if TKTP = TIE. If INAC=Y, the digit insertion option (INST) is bypassed.
ISAR	**N**	designate ISA route	Enter N for No for dedicated trunks.	See ISA service guide (NTP 555-8001-102) for configuring ISA routes.
IEC	001-999	interexchange carrier ID		Prompted if ISDN = Y and TKTP = COT, FEX, or WAT.

LD16 (continued)

Step 5 (continued): LD16 (RDB).

Prompt	Options	Description	Requirements	Comments
SRCH	**LIN** or RRB	linear (LIN) or round robin (RRB) search for outgoing trunk	Coordinate with far end to minimize B-channel glare. See *Correlation tables.*	Applies to outgoing trunk selection.
SIGO	ESN2-ESN3-ESN5-STD-ETN	ESN signaling arrangement: ESN2, ESN3, ESN5, non-ESN (STD), or electronic tandem network (ETN)	Requires BARS, NARS, and CDP software.	Prompted if TKTP=TIE. Use ESN5 for DTI for data applications.

LD14

Step 6: LD14 Configure PRI trunks.

Prompt	Options	Description	Requirements	Comments
TYPE	COT, FEX, WAT, DID, TIE, ISA	trunk type	TIE is required for SL-1 to SL-1 (PRI or ISL mode).	Refer to ISA service guide (NTP 555-8001-102) for configuring ISA trunks.
TN	l ch or l s c u l =0-159 ch=1-23 s=0-1 c=1-10 u=0-7	terminal # address: PRI loop# PRI channel#	Must match DLOP lll in LD17. Use loop# anD-channel# for PRI links; use loop# shelf#, card# and unit# for ISL links	Refer to ISA service guide (NTP 555-8001-102) for configuring ISA TNs.
...rtmb				
CHID	1-382	channel# for ISL trunk	Must match the far end.	The number of ISL trunks allowed for the D-channel is specified in LD17, ISLM.

LD86

Step 7: LD86 (DGT) Add ESN dialing capability.

Note: Skip this step if you do not require ESN.

Prompt	Options	Description	Requirements	Comments
CUST	0-99	customer#		
FEAT	DGT	digit manipulation data block	**Note:** Digit manipulation tables are required for home location codes. Home location code assignments are made in LD90 prompt HLOC.	
DMI	1-255	digit manipulation index (number table) for NARS/BARS		
CTYP	NCHG-INT-NPA-NXX-LOC-CDP-SPN-UKWN	Modifies the calltype according to the DMI: no change (NCHG), special international # (INT), area code (NPA), local exchange (NXX), location code (LOC), coordinated dialing plan (CDP), special # (other than international), and unknown (UKWN)	The call type must be recognized by the far end switch.	

PRI datafill dependencies

Table 13 lists the datafill dependencies in the DS-1 span. These parameters are entered in LD17.

Table 13
SL-1 PRI datafill dependencies

Signaling	DLOP ff	LCMT	LCMT	YALM	error checking
A/B for D2, D3, D4 (12 frames) *(see note)*	D2, D3, or D4 (SF format)	AMI	56K or 64KI	DG2	BPV
		B8S	64KI	DG2	BPV
A/B/C/D (24 frames)	ESF	B8S	64KC	DG2 or FDL	BPV and CRC

Note: Channel bank format D3 interface one DS-1 span; channel bank format D4 interfaces two DS-1 spans.

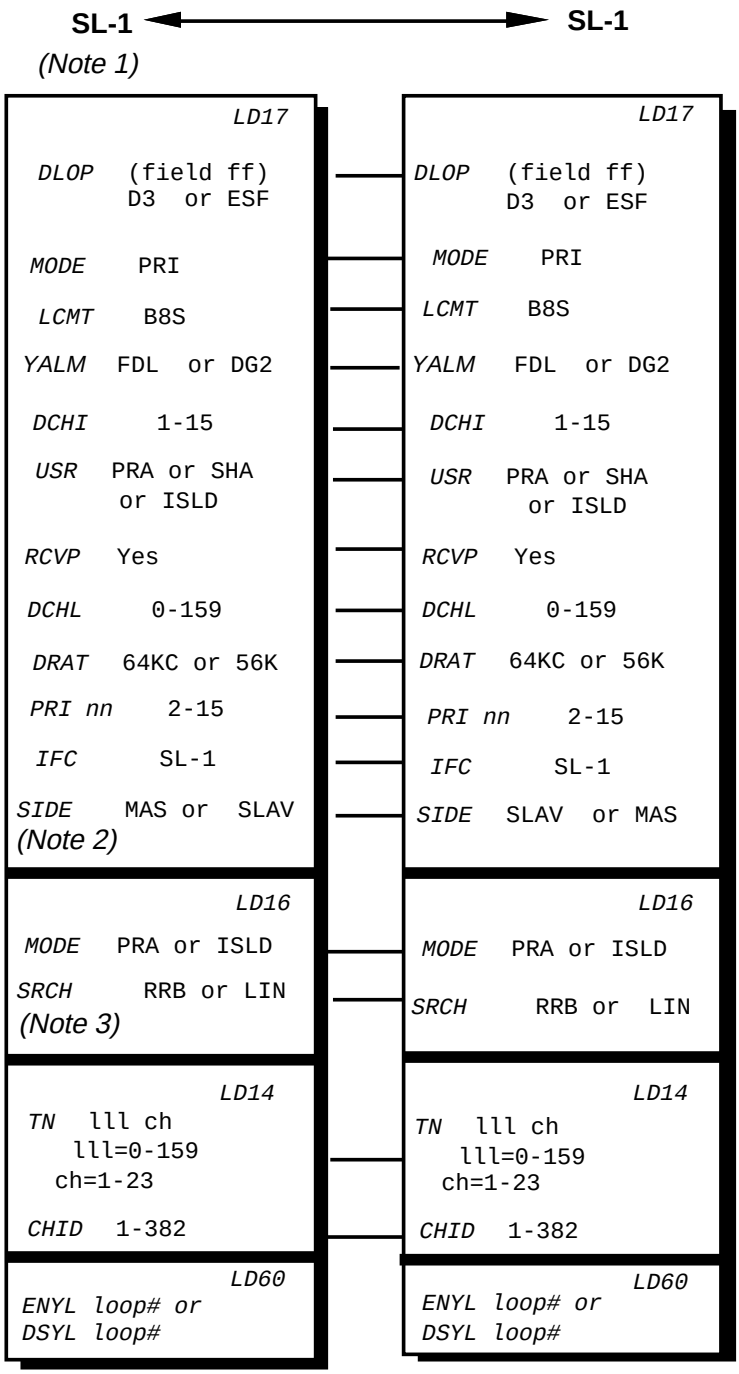
Correlation tables

The correlation tables that follow show the parameters that must be coordinated with the near end and far end for network service.

- Refer to *ISDN PRI administration* (553-2901-300) for a complete list of SL-1 ISDN database and applications parameters.

  Note: Because ISDN is an evolving architecture, there may be some differences in datafill between different product types.

SL-1 to SL-1 correlation table



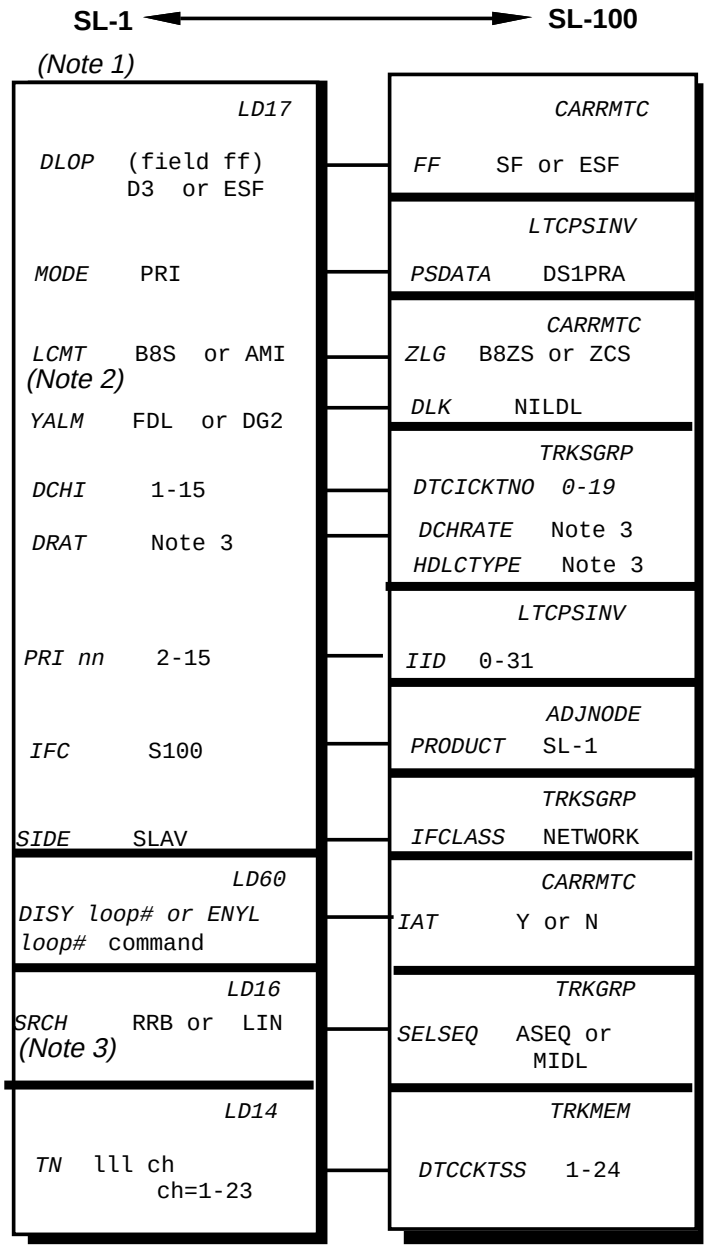
Note 1:
Refer to *SL-1 datafill , PRI datafill dependencies* for required consistencies in the PRI interface at the node level.

Note 2:
The endpoints must have opposite values.

Note 3:
The endpoints must be identical: both must be LIN or both must be RRB.

Key
Prompts appear in *italics*
Defaults appear in **boldface**

SL-1 to SL-100 correlation table



Note 1:
Refer to *SL-1 datafill , PRI datafill dependencies* for required consistencies in the PRI interface at the node level.

Note 2:
The following combinations are valid:

SL-1	SL-100
B8S	B8ZS
AMI	ZCS

Note 3:
The following combinations are valid:

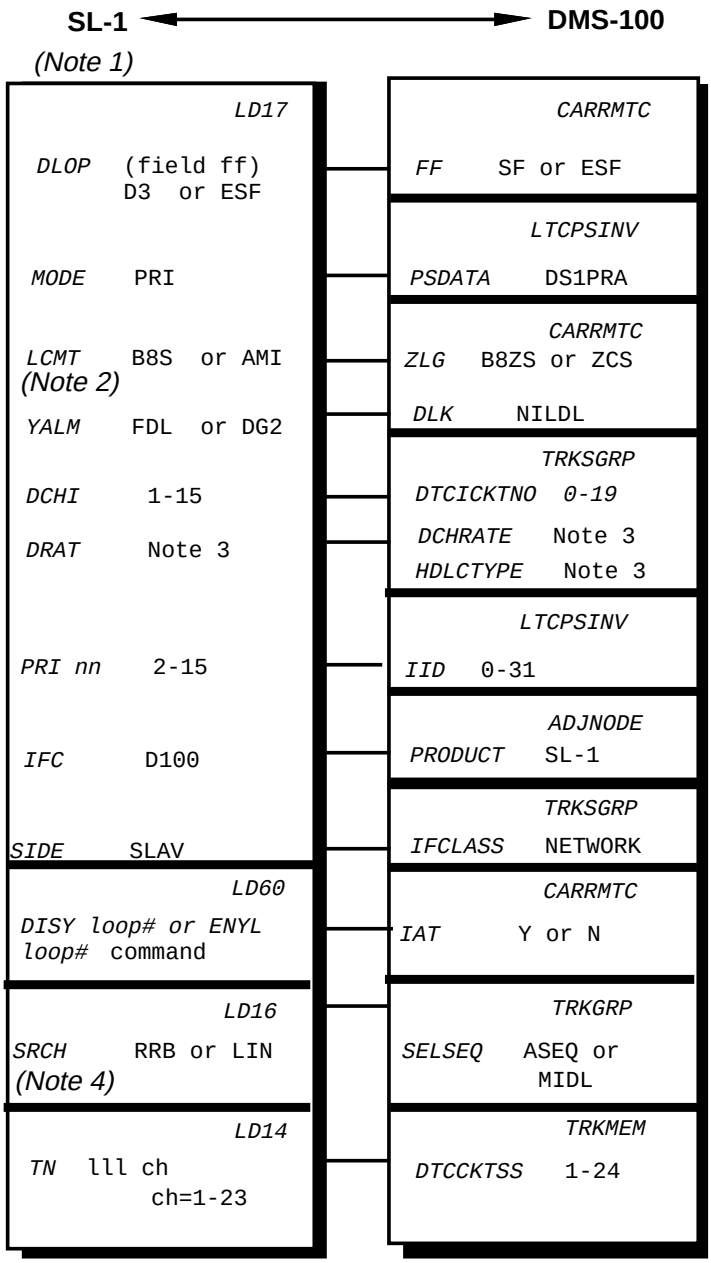
SL-1	SL-100	
DRAT	*DCHRATE*	*HDLCTYPE*
56K	56K	HDLC
64KC	64K	HDLC
64KI	64K	INVHDLC

Note 4:
The following combinations are valid:

SL-1	SL-100
LIN	ASEQ
RRB	MIDL

Key
Prompts appear in *italics*
Defaults appear in **boldface**

SL-1 to DMS-100 correlation table



Note 1:
Refer to *SL-1 datafill*, *PRI datafill dependencies* for required consistencies in the PRI interface at the node level.

Note 2:
The following combinations are valid:

SL-1	DMS-100
B8S	B8ZS
AMI	ZCS

Note 3:
The following combinations are valid:

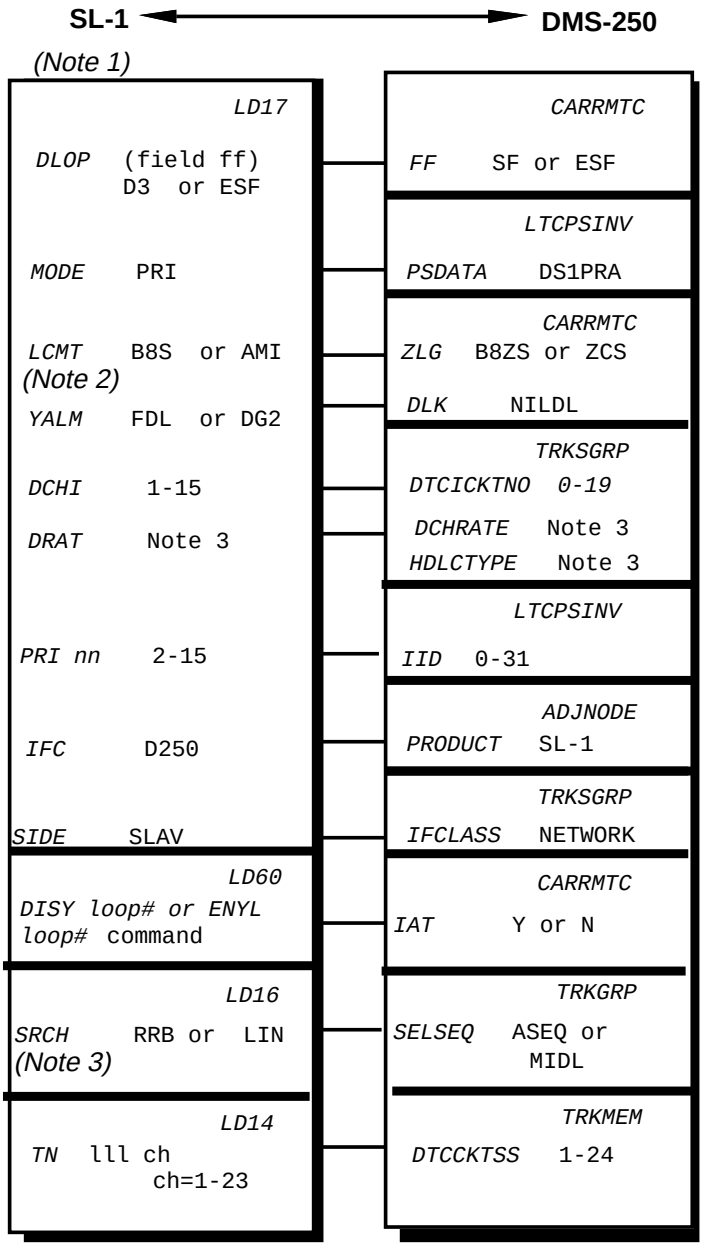
SL-1	DMS-100	
DRAT	*DCHRATE*	*HDLCTYPE*
56K	56K	HDLC
64KC	64K	HDLC
64KI	64K	INVHDLC

Note 4:
The following combinations are valid:

SL-1	DMS-100
LIN	ASEQ
RRB	MIDL

Key
Prompts appear in *italics*
Defaults appear in **boldface**

SL-1 to DMS-250 correlation table



Note 1:
Refer to *SL-1 datafill , PRI datafill dependencies* for required consistencies in the PRI interface at the node level.

Note 2:
The following combinations are valid:

SL-1	DMS-250
B8S	B8ZS
AMI	ZCS

Note 3:
The following combinations are valid:

SL-1	DMS-250	
DRAT	*DCHRATE*	*HDLCTYPE*
56K	56K	HDLC
64KC	64K	HDLC
64KI	64K	INVHDLC

Note 4:
The following combinations are valid:

SL-1	DMS-250
LIN	ASEQ
RRB	MIDL

Key
Prompts appear in *italics*
Defaults appear in **boldface**

Traffic measurements

This section describes traffic measurements associated with PRI or basic call service. For a complete list of traffic measurements, refer to *Traffic measurements*, NTP 553-2001-450.

Trunk and route (TFC002)

Traffic measurements on PRI trunk routes are reported as normal according to group number. There are no additional traffic measurements specific to basic call service. The trunk and route report (TFC002) is obtained as part of the scheduled traffic report run.

D-channel statistics (TFS009)

To include D-channel measurements in the scheduled traffic reports, use the Set System Traffic Options (SOPS) command. For example, to enable option 9 use:

LD2

SOPS 9

To print current D-channel measurements, use the Invoke System Traffic (INVS) command. For example, to enable option 9, use:

LD2

INVS 9

The TFS009 report (see Figure 5) provides measurements by D-channel port number as follows.

Traffic measurements (continued)

Figure 5
SL-1 TFS009 report format

TFS009	
DCH <port #>	
VAS IS <VAS ID #>	
<# inc msgs>	<# out msgs>
<# inc CP msgs>	<# out CP msgs>
<# of inc MGMT msgs	<# of out MGMT msgs
<# of inc MTCE msgs>	<# of out MTCE msgs>
<avg inc bytes/msg>	<avg out bytes/msg>
<inc DCH usage time>	<out DCH usage time>
<avg queue size RQBUF>	
<# fails to output msg (no output req buffer available)>	<# of msgs with no EOM>
<# of protocol errors>	
<# times DCH down since last report>	<DCH down time (in 2-sec units, e.g., if value is 10, downtime = 20 sec>

Circuit Traffic

Circuit statistics for PRI links use existing traffic measurements. There are no new statistics for circuit traffic.

Maintenance Logs

The count of D-channel errors is stored in the Protocol Log (PLOG). (see Figure 6).

- The PLOG is printed automatically when a protocol counter overflows.
- PLOG counters are cleared after the PLOG log is printed or the DCHI card is enabled.
- If there are high error counts in counter 10, assume there is a PRI problem. If there are low error counts in these counters but high error counts elsewhere, report a protocol problem to the National Support Center.

To print the D-channel statistics log use:

LD 96

PLOG DCHI port#

Figure 6
SL-1 protocol log format

```
DCHI n I xxxx
yy zz  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
       1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16
where:
n= D-channel #
xxxx= system real time (in hexadecimal)
yy = maintenance indication primitive ID
zz = maintenance indication task ID

counter 1 = count of missing PRI handshakes
counter 2 = count of peer-initiated re-establishment link
counter 3 = count of unsuccessful retransmit N200 of SABME
counter 4 = count of unsuccessful retransmit N201 or DISC
counter 5 = count of N(R) errors
counter 6 = count of I fields with length greater than N201
counter 7 = count of undefined frames
counter 8 = not used
counter 9 = count of FRMR frames
counter 10 = count of CRC error frames
counter 11 = count of REJ frames
counter 12 = count of messages with less than 4 octets
```

Logs (continued)

Figure 6 (continued)
SL-1 protocol log format

counter 13 = count of undefined protocol discriminators

counter 14 = count of undefined message types

counter 15 = count of messages missing one or more mandatory information elements

counter 16 =count of messages missing one or more undefined information elements

Alarms

Table 14 lists common PRI alarms that affect basic call service. The system provides automatic detection and recovery for most faults.

Table 14
SL-1 Alarms

Message	Effects	Remedy
Yellow alarm (remote alarm) T1 connection exists but far end not ready. (FAR END FAULT)		
DTA005 Yellow alarm	PRI is disabled; YEL and DIS LED on PRI ON; yellow alarm counter incremented.	1. Contact far end. 2. PRI is restored when yellow alarm no longer received.
DTA006 24-hr out-of-service limit	PRI is taken out of service when count reaches RALM in LD73; red alarm is raised; the error counter is cleared.	1. Cleared when far end is up. When fault clears, type: **LD 60** **DISL** loop# **ENLL** loop# 2. Run a loopback test.
DTA007 Cleared	PRI is restored.	
DTA008 Disabled		To enable, type: **LD 60** **ENYL** loop#
Red alarm (local alarm) PRI card or transmission fault (NEAR END FAULT)		
(no message)	PRI is taken out of service; RED and DIS LED on PRI ON;yellow alarm pattern sent to far end.	1. Check PRI status: **LD 60** **STAT** loop# 2. Check PRI counters: **LD 60** **LCNT** loop# The PRI is automatically restored to service when the condition clears, provided the 24-hr threshold is not exceeded.

Alarms (continued)

Table 14 (continued)
SL-1 alarms

Message	Effects	Remedy
DCHI alarm: DCHI card disabled (NEAR END FAULT)		
(no message)	DCHI LED is ON. PRI is taken out of service.	Run DCHI self tests (see *Maintenance, Tests* in this section). **Note:** If both ports are configured, the LED is ON only when both ports are disabled.
Bit error rate alarms: link transmission errors (NEAR END FAULT)		
DTA011 Maintenance limit	Counter is incremented.	Midnight routines print # of errors and clear the counters.
DTA012 Out-of-service limit	PRI is taken out of service; red alarm is raised.	PRI automatically returned to service when rate improves.
DTA013 24-hr out-of service limit	If BIPC=0 in LD73, trunks re-stored automatically. Otherwise, PRI taken out of service; red alarm is raised.	To restore service manually, type: **LD 60** **DISL** loop# **ENLL** loop#
DTA014 Cleared	PRI is restored	
Frame slip*:* clock sync error (NEAR END FAULT)		
DTA015 Maint limit (tracking mode)	Counter is incremented	Midnight routines print # of errors and clear the counters
DTA016 Out-of-service limit (tracking mode)	PRI taken out of service; red alarm is raised.	To restore service, type: **LD 60** **DISL** loop# **ENLL** loop#
DTA017 Maint limit (free run mode)	Counter is incremented	Midnight routines print # of errors and clear the counters
DTA018 Out-of-service limit (free run mode)	PRI taken out of service; red alarm is raised.	Check DLOP, LCMT, DRAT, and YALM (LD17) with far end. To restore service, type: **LD 60** **DISL** loop# **ENLL** loop#

Alarms (continued)

Table 14 (continued)
SL-1 alarms

Message	Effects	Remedy
DTA026 Guard timer started for automatic recovery	PRI taken out of service and guard timer started according to SRGT in LD73	1. Disable and enable loop: **LD 60** **DISL** loop# **ENLL** loop# 2. Run a loopback test to isolate the problem to the near or far end.
DTA027 Guard timer expired	PRI kept out of service.	1. Disable and enable loop: **LD 60** **DISL** loop# **ENLL** loop# 2. Check tracking status in LD60 with the TRCK PCK command.
DTA028 SRIM timer expired without improvement in slip rate; maintenance message count (SRMM in LD73) is exceeded..	PRI kept out of service; guard timer restarted.	Same as DTA027.
DTA029 The # of allowable maintenance messages (SRMM in LD73) is not exceeded.	PRI is restored.	Same as DTA027.
Frame alignment: out-of-frame error		(NEAR END FAULT)
DTA019 Maint limit		Check DS-1 connection to far end.
DTA020 Out-of-service limit	If LFAC=0 in LD73, trunks restored automatically. If not, PRI is taken out of service ; red alarm is raised; the error counter is cleared.	1. To restore service, type: **LD 60** **DISL** loop# **ENLL** loop# 2. If alarm is raised again, run a loopback test.

Alarms (continued)

Table 14 (continued)
SL-1 alarms

Message	Effects	Remedy
DTA021 Errors continued for 3 secs	PRI taken out of service	1. To restore service, type: **LD 60** **DISL** loop# **ENLL** loop# 2. Run a loopback test.
DTA022 Errors cleared for at least 15 secs	PRI serviced restored.	
DTA023 PRI loop is up		
PRI automatic loop test : status		(NEAR END FAULT)
DTA024 Self test failed.	All channels disabled; red alarm	1. For repeated failures, replace the DTI card. 2. Check all other hardware, including cabling.
DTA025 Self test passed after being disabled.	Channels restored and red alarm removed.	

Status messages

Table 15 lists common status messages that affect basic call service. For a complete list of maintenance messages refer to the X11 I/O Guide (NTP 553-30001-400).

Table 15
SL-1 status messages

Message	Remedy
Yellow alarm	
DTI031 Loop is enabled but PRI is in yellow alarm	Wait for far end to respond. Contact the far end to resolve the situation.
B-channel	
PRI100 loop# ch# The B-channel specified is locked out because far end is using a different channel.	Disable and enable the channel (using the ENCH and DNCH commands) to try to seize the channel. If it fails, contact the far end to resolve the problem.
PRI101 loop# ch# c# B-channel specified is locked out. Cause (c#) = 82 channel does not exist; c=44 requesteD-channel not available; or c=6 alternate section acceptable.	If cause = 82, contact the far end to program the channel. If cause = 44, trace the channel to see if there is a valid call on it. Call the far end to resolve the problem. If cause = 6, check the routing tables.
D-channel	
DCH1003 device# protocol layer# error# protocol error	Check DLOP, LCMT, DRAT, and YALM (LD17) with far end. For D-channel status (see note): **LD 96** **STAT DCHI** port# ***Note :*** For ISL links, use **LD36**, **STAT** loop# shelf# card# unit# to check D-channel status. To print protocol log: **LD 96** **PLOG DCHI** port# To test DCHI: **TEST** 100 channel# **TEST** 101 channel# **TEST** 200 channel# **TEST** 201 channel#
DCH1006 Far end D-channel is down	1. To check D-channel status: **LD 96** **STAT DCHI** port# 2. Check PRI and DCHI cable. 3. Contact the far end.

Tests

Table 16 lists the tests for verifying network operation at the trunk or link level. For a complete list of SL-1 system tests, refer to *SL-1 ISDN PRI/DCHI maintenance* (NTP 553-2901-500).

Table 16
SL-1 tests

Manual Tests		
PRI Self Test (or Local Loopback Test)	Tests transmitted and received DS-1 signal. (XMT signal sent to REC signal on PRI card.) LBK LED is ON.	1. Disable DCHI: **LD96** **DIS DCHI** port# 2. Disable PRI and start test: **LD60** **DISL** loop# **SLFT** loop# (all channels) or **SLFT** loop# ch# Responds SLFT OK or DTAxxx if test fails.
DCHI Self Test		1. Disable DCHI and start test: **LD96** **DIS DCHI** port# **SLFT DCHI** port# 2. To test DCHI: **TEST** 100 channel# **TEST** 101 channel# **TEST** 200 channel# **TEST** 201 channel#
Remote Loopback Test	Checks PRI integrity to far end and back. Causes far end to raise and clear yellow alarm.	1. Contact craftsperson at the far end to set up loopback mode (specify frame or channel): **LD96** **DIS DCHI** port# **LD60** **DISL** loop# **RLBK** loop# 2. After loopback mode is confirmed, start test: **LD96** **DIS DCHI** port# **LD 60** **DISL** loop# **RMST** loop# A DTIxxx message is received if the test fails.

Tests

Table 16 (continued)
SL-1 tests

Automatic Tests		
PRI Self Test	Performed when PRI card is plugged	Test failure shows: **DTI009** loop# channel#
PRI Automatic Loop Test	Same as PRI Self Test but run automatically with midnight routines. This automatically clears all counters.	1. Ensure ATLP=1 for all channels or ATLP= 0 for one channel (random channel selected) in LD60.

Meridian 1/SL-100

Basic call service is supported by the following Meridian 1/SL-100 network configurations:

- SL-100 «» SL-1
- SL-100 «» SL-100
- SL-100 «» DMS-100
- SL-100 «» DMS-250

ESN signaling is supported by the following Meridian 1/SL-100 network configurations:

- SL-100 «» SL-1
- SL-100 «» SL-100
- SL-100 «» DMS-100

This section describes PRI links for basic call and ESN signaling. Because SS7 is a mature product, SS7 links are not discussed in detail.

This section documents BCS 30 for the SL-100 and Release 15 for the SL-1.

In this document, the Meridian 1/SL-100 product is referred to as SL-100 to facilitate searching in COMPASS.

Engineering planning SL-100 network options

The SL-100 supports PRI and SS7 links for ISDN networks. An ISDN *link* includes the signaling link and associated trunks. Table 17 provides a summary of the SL-100 network options for basic call.

- PRI links use a message-based, common channel signaling protocol, nB + D. Call control signaling (Q.931) is provided by the D-channel; the B-channels serve as voice/data trunks. The B and D-channels are carried on the PRI interface on one or more DS-1 spans.
- SS7 (or CCS7) links also use a message-based, common channel signaling protocol that separates the signaling link for call control from the voice/data trunks. SS7 trunks are ISDN User Part (ISUP) trunks. ISUP is the call control signaling protocol in SS7.

For PRI and SS7 signaling, the signaling link can reside on the same facility as the voice/data trunks, or it can be a separate facility.

Table 17
SL-100 network options

Trunk	PRI		SS7
Mode	PRI only	ITA (PRI + T1 A/B) *(note 1)*	SS7
Restrictions			Not available for SL-1 «» SL-100 links.
BCS Software	BCS 29 minimum		BCS 26 minimum. ESN signaling requires BCS 27.
Capacity	Up to 20 DS-1 spans (1D + 479 B) D-channel: 1 min to 32 max B-channel: 1 min to 479 max.*(note 2)* One DS-1 link can carry multiple D-channels.		Refer to the appropriate SS7 NTP.
ESN Support	yes		yes

Note 1: With Integrated Trunk Access (ITA), both PRI trunks and PTS trunks (trunks with inband A/B signaling) are allowed on the same DS-1 span. However, special tone receivers (STRs) cannot be used on A/B trunks in ITA configurations.

Note 2: One D-channel supports up to 479 B-channels. However, for reliability, a lower D-channel to B-channel ratio (1D:47B or one D-channel per two DS-1 links) is recommended.

PRI interface considerations

Basic call is configured as part of PRI or SS7 interface installation. Table 18 lists PRI interface requirements and networking considerations and provides a brief overview of PRI datafill for the SL-100.

Refer to the *PRI Interface* section in the *Overview* section for a general description of PRI interface characteristics.

Table 18
SL-100 PRI interface summary

Link	PRI
Feature Packages (see *Software*)	ISDN PRI, PRI/CCS7 Interworking, Backup D (future BCS)
Implementation	The PRI interface is provided by the DTCI PM. The DTCI is similar to the DTC PM, except that it supports both PRI and non-PRI trunk signaling and does not support the Special Tone Receiver (STR) card. All trunk types valid on DTCs are valid on DTCIs, except for SS7. An ISDN Signaling Preprocessor (ISP) card provides D-channel signaling for the PRI interface. The B and D-channels are associated with DS-1 spans in datafill.
Requirements	The DTCI requires the 6X69AB message switch card, the BX01AA ISP card, and a special load that includes the load for the ISP card. Four C-side ports should be datafilled in LTCINV to connect the DTCI to the network.
Networking Considerations	A DS-1 channel can be a B-channel, a D-channel, or a nailed up (provisioned) channel. By convention, the D-channel is assigned to channel 24. A DS-1 span can carry multiple D-channels. The D-channels only support B-channels on the same DTCI. Because the DTCI also supports non-PRI trunks, backup trunk groups can be configured on the same DTCI. However, for reliability, non-PRI trunk groups should be used for backup, preferably on a different PM. All data calls over a PRI B-channel are transported with bit transparency by removing the PADS associated with the PRI trunk.

PRI interface considerations (continued)

Table 18 (continued)
SL-100 PRI interface summary

Database Configuration for PRI (see *SL-100 Datafill*)	A PRI trunk group is defined by: • Entering IBNT2 for the trunk type in table TRKGRP. • Entering ISDN for the signaling type and defining the D-channel in table TRKSGRP. • Defining each B-channel in table TRKMEM. • Assigning an LTID to the PRI interface (as defined in tables LTDEF, LTMAP, and LTCALLS) which is used to route calls.

Basic call service considerations

Table 19 lists basic call service requirements and networking considerations and provides a brief overview of datafill for basic call service service on the SL-100.

Refer to the *Call Processing* section in the *Overview* for a general description of basic call processing on PRI links.

Table 19
SL-100 basic call service services

Link	PRI
Feature Packages	Requires ISDN PRI feature packages only.
Implementation	Basic call is configured as part of PRI installation.
Requirements	None additional.
Networking Considerations	Route selection should be set up to select the PRI trunk first with overflow re-routing to the non-PRI trunks. Bearer capability allows you to restrict trunk groups to carry data only, voice only, voiceband data, or a combination of services. If the capability is disallowed, calls requiring that service may not originate or terminate on the PRI interface. Bearer capability is compatible with all existing features, although it is not fully supported in hunt groups. BC is not supported on UCD or ACD lines. For conference calls, only speech BC is supported. All private call originations on a PRI are considered to be intragroup. This can be overriden in IBN translations by datafilling the INTRAGRP flag to N in table IBNXLA.

Basic call service considerations (continued)

Table 19 (continued)
SL-100 basic call service considerations

Database Configuration for Basic Call (see *SL-100 Datafill*)	The call type (received in the setup message NSF IE) and LTID associated with the trunk indexes table LTCALLS for translations and routing. An NPI of private or public is supported. Normal routing applies. Authorized bearer services for the PRI trunk are datafilled in LTDEF as a characteristic of LTID, field OPTIONS. Tables BCDEF, BCCOMPAT, and KSETFEAT define the bearer capabilities, BC compatibilities, and assign BCs for SL-100 terminals. If the SL-100 tables show that the BCs are compatible, the call is completed. If the BCs are not compatible, the call is not completed and the originator is given a CNAC. No BC screening is done for non-PRI trunks. Access to a particular network can be accomplished in several ways: • Datafilling the DFLNET option in table NCOS to allow stations within a customer group and NCOS to automatically access a particular network. • Datafilling the LOGNET option in table IBNXLA to allow stations in a customer group to use dialed codes to access different networks.
Feature Interactions	None

ESN signaling considerations

ESN signaling in ISDN networks is supported by both PRI and SS7 links. SS7 supports the same ESN features PRI supports.

Table 20 provides an overview of the SL-100 requirements for implementing ESN signaling on PRI links.

Table 20
SL-100 summary for ESN signaling

Link	PRI
BCS Software	BCS 25 minimum
Feature Packages	In addition to the ISDN PRI packages, the current ESN packages are required to support ESN on PRI.
Implementation	PRI supports all PBX/Centrex ESN features for ISDN networking or provides identical features in MCDN calling services.
Requirements	There are special datafill requirements for ESN signaling for the SL-100 when connected to an SL-1. Tables PACMAN, COSMAP, and COSDATA must be datafilled to accommodate ESN digits incoming from the SL-1, and table DIGMAN must be datafilled for calls outgoing to the SL-1. These considerations apply only to BCS 30.
Networking Considerations	None additional.
Database Configuration for ESN (see *SL-100 Datafill)*	A call type of PRIVATE is defined for the LTID in table LTCALLS and the translations attributes are obtained from the translations selector (XLARTE) specified in table LTCALLS. Table COSDATA maps TCOS to NCOS for compatibility between two SL-100s (See *SL-100 Datafill, NCOS to TCOS Mapping*.)

Software requirements

Table 20 shows the software dependencies for basic call service and ESN signaling for BCS 30 and above. Only those capabilities related to PRI, basic call service, or ESN signaling on a PRI link are included.

Table 21
Meridian SL-100 PRI basic call and ESN feature packages

Number	Description	Comments
NTX790AB	ISDN PRI	• PRI links to SL-1, SL-100, and DMS-250 • Includes ESN signaling support
NTX794AA	PRI/SS7 Interworking	Call completion between PRI and SS7 switches

Hardware requirements

Figure 7 shows the basic hardware architecture for PRI links. The necessary equipment includes:

- An ISDN Digital Trunk Controller (DTCI)--the DTCI uses the same two-shelf arrangement used by the DTC.
- A Network Termination (NT1)--the NT1 performs the terminating functions for the T1 transmission loop and is usually located on the subscriber premises.

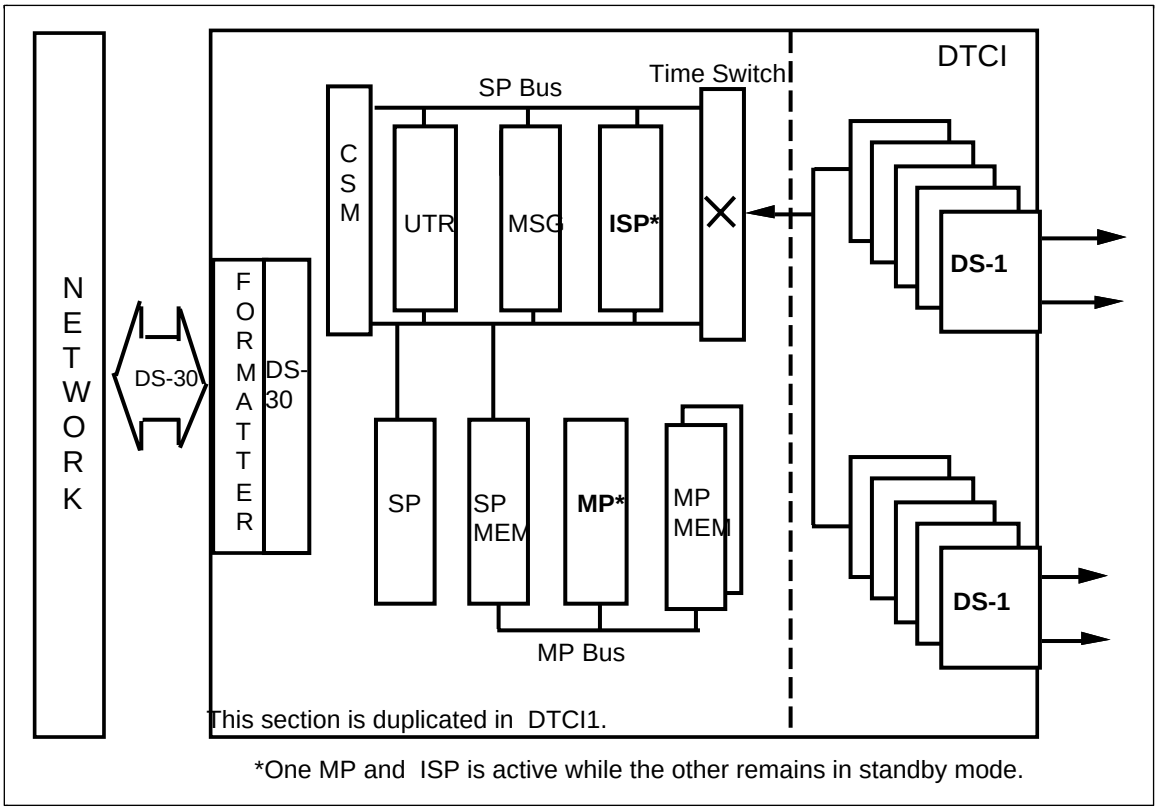
The DTCI can accommodate both PRI and A/B bit trunks within the same shelf. With Integrated Trunk Access (ITA), both A/B bit trunks and PRI trunks can be provisioned on the same DS-1 span.

Note 1: The DTCI does not support SS7 (CCS7 ISUP) trunks.

Note 2: The ISP16, UTR15, and MSG6X69 are also required.

Note 3: The DTCI does not support the STR card.

Figure 7
SL-100 PRI hardware configuration



Hardware requirements (continued)

Table 22 shows the important hardware requirements for PRI links.

Table 22
SL-100 PRI hardware description

Card	Abbreviation	NT_PEC	Comments
ISDN Common Peripheral Controller or ISDN Cabinet Trunk Module	CPEI (SL-100) (*note 1)* MCTM-I (Cabinetized Meridian SL-100)	6X01AB NX33AA	Up to 2 DTCI units: DTCI1 and DTCI2.
ISDN Digital Trunk Controller	DTCI	n/a	The DTCI consists of two shelves (0 and 1) supporting up to 20 DS-1 links (10 DS-1 cards) for 480 channels. DS-1 cards per shelf:1 min, 5 max . Each DS-1 card serves both DTCI units and is controlled by the currently active DTCI unit.
DS-1 Interface Cards	DS-1	6X50AA or 6X50AB *(note 2)*	Slots 0-5 in DTCI. Each card supports two DS-1 links (24 channels). Set switch settings according to distance to cross-connect.
ISDN Signaling Preprocessor	ISP	BX01AA	Slot 16 in DTCI. Supports up to 32 D-channels.
Master Processor	MP	6X45AC	Slot 8 in DTCI.

Note 1: The DTEI (used on other equipment types) is essentially the same as the CPEI.

Note 2: NT6X50AB card supports both ZCS (AMI) and B8ZS coding and SF or ESF framing formats. NT6X50AA supports ZCS and SF only. See *PRI datafill dependencies* in Table 24.

Installation rules

The following rules and recommendations apply to PRI installations. This section assumes that the PRI hardware is properly installed and configured.

Node

1. Install a maximum of 20 DS-1 links for each DTCI.
2. Datafill the SL-100 according to the sequence in Table 71 and with the appropriate entries, as described in the SL-100 datafill section.
3. The following recommendations apply to configuring channels:
    - Each 6X50 card supports two DS-1 spans. Install one DS-1 card for every 2 D-channels (assuming 23B +D).
    - Distribute the D-channels over as many DS-1 cards as possible.
    - A minimum of one D-channel for two DS-1 links is recommended.
    - Leave unused B-channels undatafilled or provision them as PTS trunks.

    Note:If the DS-1 is being configured for Integrated Trunk Access (ITA), A/B trunks may be datafilled on non-PRI channels of the DTCI.

6. After datafill, load the DTCI and return it to service from the PM level of the map using the following commands:

    PM POST DTCI <DTCI#>

    BSY PM

    RTS PM

7. Return the carrier to service using the following commands:

    MAPCI;TRK;CARRIER

    POST DTCI <DTCI#>

    BSY ALL

    RTS ALL

Installation rules (continued)

8. Post the B-channels from the MAP and return the B-channels to service using the following MAP commands:
   - to enter the PRADCH level of the MAP--

     MAPCI;MTC;TRKS;TTP;PRADCH
   - to post the B-channels--

     POST G <trunk CLLI>
   - to MB the DCH if INB--

     BSY ALL
   - RTS the posted DCH--

     RTS ALL

     The D-channels will go to DMB state (D-channel mode busy).
9. Post the D-channels from the MAP and return the D-channels to service using the following MAP commands:
   - to enter the PRADCH level of the MAP--

     MAPCI;MTC;TRKS;TTP;PRADCH
   - to post the D-channel--

     POST GD <trunk CLLI> or **POST D** <circuit#>
   - to MB the DCH if INB--

     BSY
   - RTS the posted DCH--

     RTS
10. Run internal continuity tests on the D-channel. See *Maintenance,Tests.*

Network

11. When service is available end-to-end, run external continuity tests on the D-channels. See *Maintenance, Tests.*

SL-100 datafill PRI datafill considerations

The following tables show the database parameters associated with configuring PRI and ESN capabilities. These tables describe datafill for dedicated trunking only. To configure ISA on the PRI link, refer to the *ISA Network Services Guide* (NTP 555-8001-102).

- Only entries for the DTCI configuration are listed.
- The PRI interface datafill dependencies are listed in table x.
- Correlation tables show the parameters that must be coordinated with the far end for network service. See *SL-100 datafill, correlation tables.*

Datafill presentation

In the following datafill tables, defaults are presented in **boldface**. Example tuples are presented at the end of a table. An example that is one continuous record may be shown on more than one line due to space limitations. Not all fields in a table may be shown. Only those fields important to PRI, basic call service, or ESN signaling are presented.

Important datafill considerations

The following datafill considerations apply:

- The CLLI name for the trunk group must be consistent throughout the datafill tables.
- Before deleting a code from the CLLI table, it must first be deleted from all tables that reference it (except for the CLLI maintenance table, which requires that the name first be deleted from table CLLI).
- To extend the CLLI or TRKGRP table, change the value of the field SIZE for the table in the System Data Table (SYSDATA) and do a cold restart. To increase the size of table TRKMEM, change field TRKGRSIZ in table CLLI--no restart is required.
- With the table editor in interactive mode, to increase the value of the trunk group size, delete all trunk members in TRKMEM (the trunk group size is set to 0). Then reset to the higher value.
- When changing data for a trunk member, that member must be placed in the INB state.
- A TRKSGRP tuple cannot be changed or deleted unless the D-channel is in INB state.

PRI datafill sequence

Table 23 shows the datafill sequence for the PRI interface and basic call service on the SL-100. The PRI interface is configured first (steps 1-10), then the basic call service tables are filled (steps 11-15).

Steps 11 through 15 must be completed to define the type and level of services to be provided on the PRI interface, including bearer capabilities for the PRI trunks. The mapping of these logical attributes to the physical interface is done through table LTMAP.

The bearer services tables are datafilled last. These are described in the SL-100 section, *Bearer services datafill considerations*.

Table 23
SL-100 PRI datafill sequence

		Initial install	*Add a trunk mem-ber*	*Add DS-1 span*	*Add a C-side link*
1. CLLI	Define the trunk group name and size.	X			
2. PADDATA	Define the transmit and receive pad values for the trunk group. (Optional; a default pad set is provided.)	OPT			
3. TRKGRP	Configure the trunk group.	X			
4. OFCENG	Define the number of allowable simultaneous PRI/SS7 calls.	X			
5. LTCINV	Identify the DCTIs to the system software (C-side port #).	X			X
6. CARRMTC	Configure DS-1 carrier and set error rates and alarms. (Optional; a default tuple for 64K clear is provided.)	OPT			
7. LTCPSINV	Identify the DS-1 cards that are associated with a DTCI to the software (P-side port #) and datafill IID for PRI.	X		X	X
8. ADJNODE	Define the connection type and software versions of adjacent nodes.	X			

PRI datafill sequence (continued)

Table 23 (continued)
SL-100 PRI datafill sequence

		Initial install	*Add a trunk member*	*Add DS-1 span*	*Add a C-side link*
9. TRKSGRP	(sub of TRKGRP) Define the D-channel for the trunk group	X			
10. TRKMEM	Define the trunks (B-channels) for the trunk group.	X	X	X	X
11. LTDEF	Define the logical terminal (LT) and access privileges	X			
12. LTDATA	Specify additional service-related data for the LTID.	X			
13. LTCALLS	Reference the initial translations associated with the call.	X			
14. LTMAP	Maps an LTID to the trunk group CLLI.	X			
15. CUSTNWK	Define the customer networking features, including the display.	X			

CLLI table

Steps 1 through 10 define the PRI facilities for basic call processing.

Step 1: CLLI Define the trunk group name and size.

Note:The maximum number of CLLI codes is 8191.

Field	Entry	Description	Requirements	Comments
CLLI	alphanumeric (up to 12 characters)	trunk group name	Same as GRPKEY in TRKGRP. Use a period (.) or underline (_) to separate fields (leave no blanks).	It is recommended that you include PLACE, PROV, BLDG, TRAFUNIT, SUFX in this entry.
ADNUM	0 or 1 less than the CLLI table size	administrative trunk group number		
TRKGRSIZ	0-2047	the # of trunk group members	Use a number greater than the number of initial working trunks.	Because the trunk members must be on the same DTCI, the maximum number of PRI trunks is 480.
ADMININF	alphanumeric (up to 32 characters)	administrative information used by the operating company.	Use alphanumeric characters and underscores only. Use a period (.) or underline (_) to separate fields (leave no blanks).	It is recommended that you use TRAFCLS, OFFCLS, TRKGRTYP for this entry.
Example: **K2CPR64CL 100 24 PH_43_IT**				

PADDATA table

Step 2: PADDATA Define the transmit and receive pad values (optional).

Note: Use the default pad values provided or enter new values according to distance and hardware constraints.

Field	Entry	Description	Requirements	Comments
PADKEY		= subfields PADGRP1 and PADGRP2	Must match field PADGRP in table TRKGRP.	Memory is automatically allocated for 64 pad groups. Up to 23 pad groups can be customer defined.
PADGRP1	alphanumeric (up to 4 characters)	pad group 1 name	Enter NPDGP if no PADS are desired.	PRAP is reserved for SL-100 PRI.
PADGRP2	alphanumeric (up to 4 characters)	pad group 2 name	Enter NPDGP if no PADS are desired.	Use a reserved or a customer-defined pad group.
PAD1TO2	0 to 14L	the network transmit pad		If a reserved pad group is used, this value is automatically set.
PAD2TO1	0 to 14L	the network receive pad		If a reserved pad group is used, this value is automatically set.
Example: **PRAP PRAP 0 0**				

TRKGRP table

Step 3: TRKGRP Configure the trunk group.

Note: Maximum Size = 2048 trunk groups; maximum # of LTIDs = 1022.

Field	Entry	Description	Requirements	Comments
GRPKEY		= subfield CLLI		
CLLI	alphanumeric (up to 12 characters)	CLLI name for the trunk group	Same as trunk group name in CLLI table.	
GRPTYP	IBNT2	trunk group type	Use IBNT2 for SL-100 PRI.	This entry determines what fields are required.
TRAFSNO	0-15 or 0-127	Traffic separation number for the trunk group. Allows peg counts by type of call.	If not required, enter 0.	0-127 with optional software NTX085AA.
PADGRP	alphanumeric (up to 10 characters)	pad group name assigned to the trunk group	Enter NPDGRP if no PADS are desired. Must match PADKEY in table PADDATA.	
NCCLS	NCRT, NCTC, NCLT, NOSC, NCBN, NCID, NCOT, NCIT, NCIC, NCON, NCOF	No Circuit Class type-used to select OM register for unavailable facilities and GNCT		

TRKGRP table (continued)

Step 3: TRKGRP Configure the trunk group (continued).

Field	Entry	Description	Requirements	Comments
SELSEQ	ASEQ, DSEQ, or **MIDL**	Select sequence--selects the next idle trunk member in ascending (ASEQ), descending (DSEQ), or most idle (MIDL) sequence.	To SL-100, DMS-100, and DMS-250: Must have opposite values (ASEQ or DSEQ) at each end. To SL-1: Use ASEQ with LIN in the SL-1, or use MIDL with RRB in the SL-1.	Used to reduce B-channel glare. See *SL-100 datafill, correlation tables*.
NCOS	0-255	Network class of service defines the access privileges of a user.		Index to NCOS table.
BILLDN	N	Use CGN (N) or DN (Y) for billing for PRI interface		

TRKGRP table (continued)

Step 3: TRKGRP Configure the trunk group (continued).

Field	Entry	Description	Requirements	Comments
LTID	$	= subfields LTGRP + LTNUM	Enter a $. An LTID is required for each trunk CLLI.	This is a read-only field. If the trunk group is not associated with an LTID in table LTMAP, this field will display $ and the PRI is inaccessible.
LTGRP		logical terminal group name	This field will be updated with the LTGRP entry in LTMAP.	Not prompted.
LTNUM		logical terminal group#	This field will be updated with the LTNUM entry in LTMAP.	Not prompted.
Example**:** **K2CPR64CL** **IBNT2 0** **NPDGP NCRT** COMKODAK 0 **ASEQ 60 N** ... **(ISDN 6) $**				

OFCENG table

Step 4: OFCENG Define the number of allowable simultaneous PRI/SS7 calls.

Field	Entry	Description	Requirements	Comments
PARMNAME	NO_OF_HIS _CONTROL _BLKS	parameter name		
PARMVAL	1	parameter value	One HCB per trunk member is recommended.	
PARMNAME	NO_OF_HIS_ DATA_BLKS	parameter name		
PARMVAL	1	parameter value	One HDB per trunk member is recommended.	

LTCINV table

Step 5: LTCINV Identify the DCTIs to the system software (C-side port#).

Note: Memory is automatically allocated for a maximum of 128 tuples.

Field	Entry	Description	Requirements	Comments
LTCNAME		= subfields XPMTYPE + XPMNO		Automatically adds entries to LTCPSINV.
XPMTYPE	DTCI	peripheral module type		
XPMNO	0-127	peripheral module#		
FRTYPE	CPEI	frame type for the XPM		Enter MCTM for cabinetized DMS-100.
FRNO	0-511	frame# for FRTYPE		
SHPOS	18, 32, 51, or 65	shelf position of the frame (inches)		
FLOOR	0-99	floor location of PM		
ROW	A-H, J-N, P-Z, AA-HH, JJ-NN, PP-ZZ	row location of PM		
FRPOS	0-99	bay position in row of PM		
EQPEC	6X01AB	the PEC of the XPM (CPEI)		
LOAD	alphanumeric (up to 8) characters	issue of the peripheral module software		The ISP load is included in the DTCI load.

LTCINV table (continued)

Step 5: LTCINV (continued).

Field	Entry	Description	Requirements	Comments
EXECTAB	vector with 1-8 members	= TRMTYPE + EXEC subfields	PRAB DTCEX must be entered for PRI. At least one entry is required.	For ITA, the SL-100 supports two execs for the DTCI: •ABTRK DTCEX •PRAB DTCEX
TRMTYP	PRAB or ABTRK	PM terminal type: ABTRK for A/B bit trunks or PRAB for PRI trunks		
EXEC	DTCEX	Specifies the set of executive programs for TRMTYP.	Maximum # is 8.	
CSLINKTAB	vector with 3-16 members	= subfields NMNO + NMPORT + CONTMARK		
NMNO	0-31	the network module# assigned to XPM	Must correspond to C-side links 0-15 of the PM.	
NMPORT	0-63	network port# for NMNO		
OPTCARD	ISP16, MSG6X69, and UTR15	Defines XPM optional cards	Enter ISP16, UTR15, and MSG6X69--all are required for the DTCI.	UTRs, if installed, are supported only in slot 15.
PECS6X45	6x45AC	PEC for Master Processor	One PEC is required for each unit of the XPM. Enter PEC for unit 0 first.	
OPTATTR	$	optional attributes	Enter $.	Applies only to DTC CCS7 ISUP trunks.

LTCINV table (continued)

Step 5: LTCINV Identify the DCTIs to the system software (C-side port#) (continued).

Field	Entry	Description	Requirements	Comments
PEC6X40	**6X40AA,** 6X40AB, or 6X40AC	PEC for DS-30 interface card.		
Example: **DTCI 0** **DTE 0 18 0 A 7 6X01AB DTI29BP1** **(PRAB DTCEX) (ABTRK DTCEX) $ (0 20) (0 21) (1 20) (1 22) (0 4) (1 4) (0 6) (1 6) (0 22) (1 21) (0 23) (1 23) (0 5) (1 5) (0 7) (1 7) $** **(UTR15) (MSG6X69) (ISP16) $** **6X45AC 6X45AC $ 6X40AC**				

CARRMTC table

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (optional).

Note 1: You may use the default tuple for 64K clear provided or enter new values in the CARRMTC table. If DEFAULT is entered for CARRIDX in table LTCPSINV, the table does not appear.

Note 2: Data contained in this table is referenced in table LTCPSINV, field CARRIDX. Data in this table must be consistent with the datafill in TRKSGRP. See *SL-100 datafill, PRI datafill dependencies* in table 24.

Field	Entry	Description	Requirements	Comments
CSPMTYPE	DTCI	C-side node PM type.		
TMPLTBM	**DEFAULT** or alphanumeric (up to 16 characters)	the template name for the PM	DEFAULT is the initial entry provided. DEFAULT templates cannot be deleted and can be changed only by Telco.	Referred to in table LTCPSINV to provide maintenance for DS-1 links. If DEFAULT is selected, fields RTSMAL, RTSOL, ATTR, and SELECTOR are omitted.
RTSML	0-**255**	warning limit for times returned to service during the audit interval.		Enter 255 to disable this feature.
RTSOL	0-**255**	out-of-service limit for the audit interval		Enter 255 to disable this feature.
ATTR		= subfield SELECTOR		

CARRMTC table (continued)

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (continued).

Field	Entry	Description	Requirements	Comments
SELECTOR	DS1	carrier type	Enter DS1 when CSPMTYPE = DTCI.	This entry determines what fields are required.
CARD	NT6X50AA, **NT6X50AB,** or NT6X50EC	PEC code for DS-1 card.	See *SL-100 datafill*, *PRI datafill dependencies*, table 24.	NT6X50AA does not support 64K clear data links or ESF.
If CARD = NT6X50EC, the following field is required:				
ECHOI	ACCESS or NETWORK	Specify that echo cancellers are positioned on the ACCESS side or on the NETWORK side.		
The following fields are required for all CARD types:				
VOICELAW	MU_LAW or A_LAW	voice law used by the carrier	Enter MU_LAW.	This is the 1.544 Mbps, 24-channel PCM system used in North America. A_LAW is used mainly in international switches.
FF	SF or ESF	frame format: superframe (SF) or extended superframe (ESF)	Must correspond with DS-1 card code. See *SL-100 datafill*, *PRI datafill dependencies*, table 24.	

CARRMTC table (continued)

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (continued).

Field	Entry	Description	Requirements	Comments
ZLG	ZCS or B8ZS	zero logic line coding scheme for the DS-1	Use ZCS if repeaters or near end switch can't handle B8ZS. See *PRI datafill dependencies*, table 24.	ZCS results in 56 Kbps data rate; B8ZS results in 64 Kbps (64K clear).
BERB	BPV or CRC	bit error rate base	See *PRI datafill dependencies*, table 24.	
DLK	**NILDL**, FDL1, or FDL2	data link	Enter NILDL for nil data link. See *PRI datafill dependencies*, table 24.	FDL is used for transmitting yellow alarm. Currently, only NILDL is supported.
IAT	Y or **N**	inhibit alarm transit; transmit yellow alarm (N) or inhibit yellow alarm (y).		
LCGAST	1-**250**-9999	local carrier alarm group set threshold in units of 10 msecs		

CARRMTC table (continued)

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (continued).

Field	Entry	Description	Requirements	Comments
LCGACL	1-**1000**-9999	local carrier alarm clear threshold in units of 10 msecs		
RCGAST	1-**50**-9999	remote carrier alarm set threshold in units of 10 msecs	For problems bringing carrier into service, use 1000 (10 secs).	
RCGACL	1-**50**-9999	remote carrier alarm clear threshold in units of 10 msecs	For problems bringing carriers into service, use 1000 (10 secs).	
AISST	1-**150**-9999	alarm indicator signal set threshold in units of 10 msecs		
AISCL	1-**1000**-9999	alarm indicator signal clear threshold in units of 10 msecs		
BEROL	**3**-6	BER out-of-service limit		3=>10K in 6 secs 4=>10K in 66 secs 5=>10K in 660 secs 6=>10K in 6600 secs

CARRMTC table (continued)

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (continued).

Field	Entry	Description	Requirements	Comments
BERML	4-**6**-7	BER maintenance limit		4=>10K in 66 secs 5=>10K in 660 secs 6=>10K in 6600 secs 7=>10K in 66000 secs
ES	0-**864**-9999	error second threshold in units of 10 msecs		
SES	0-**100**-9999	severe error second threshold in units of 10 msecs		
FRAMEML	0-**17**-9999	maintenance limit for frame loss		Table OFCENG also records this limit.
FRAMEOL	0-**511**-9999	lout-of-service limit for frame loss	FRAMEOL should be larger than FRAMEML or only FRAMEOL will be used.	Table OFCENG also records this limit.

CARRMTC table (continued)

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (continued).

SLIPML	0-**4**-9999	maintenance limit for frame slip		Table OFCENG also records this limit.
SLIPOL	0-**255**-9999	out-of-service limit for frame slip.	SLIPOL should be larger than SLIPML or only SLIPOL will be used.	Table OFCENG also records this limit.

Example for 64K clear (this is the default tuple):

```
DTCI   DEFAULT  255    255  DS1   NT6X50AB  MU_LAW  SF  B8ZS BPV
NILDL          N  250  1000  50  50  150  1000  3 6  864  100
               17  511   4    255   $
```

Example for 64K restricted and 56K:

```
DTCI        ZCS        255   255  DS1  NT6X50AB  MU_LAW  SF  ZCS BPV
NILDL                  N  250  1000  50  50  150  1000  3 6  864  100
                       17  511   4    255   $
```

LTCPSINV table

Step 7: LTCPSINV Identify the DCTIs to the system software (P-side port #) and datafill field IID for PRI.

Note: An entry in this table is automatically added when you add a DTCI to table LTCINV. Memory is automatically allocated for a maximum of 128 tuples.

Field	Entry	Description	Requirements	Comments
LTCNAME		=subfields XPMTYPE + XPMNO.		
XPMTYPE	DTCI	peripheral module type		
XPMNO	0-511	peripheral module#		
PSLNKTAB	vector with 0-19 members	= subfields PSLINK + PSDATA + CARRIDX + ACTION + IID.	Use DS1PRA for PRI or ITA. Use DS-1 for AB bit signaling without ISDN.	DTCI supports DS1 and DS1PRA.
PSLINK	0-19	P-side port#		
PSDATA	DS1PRA or NILTYPE	P-side interface	If carrier requires ISDN, enter DS1PRA. Enter NILTYPE if that carrier is not equipped on the DTCI.	DTCI supports DS1 and DS1PRA. For DS1, datafill CARRIDX and ACTION. For DS1PRA, datafill CARRIDX, ACTION, and IID.
CARRIDX	DEFAULT or valid template name datafilled in CARRMTC.	Index into table CARRMTC.	An entry for the PM type must already exist in table CARRMTC.	See *SL-100 datafill*, *PRI datafill dependencies*, table 24.

LTCPSINV table (continued)

Step 7: LTCPSINV (continued)

Field	Entry	Description	Requirements	Comments
ACTION	Y or N	Remove carrier from service if FRAMEOL, SLIPOL, ES, or SES is exceeded (Y).		
IID	0-31	The interface ID identifies the DS-1 spans associated with the D-channel.	For a single DS-1 span, use 0. For multiple DS-1 spans per trunk group, a different IID is required for each DS-1 in the trunk group.	Do not use 1 if connected to the SL-1.
Example: **DTCI 0** **(0 DS1PRA DEFAULT N 0) (1 DS1PRA DEFAULT N 0)** **(2 DS1PRA DEFAULT N 0) (3 DS1PRA DEFAULT N 0)** **(4 DS1PRA DEFAULT N 0) (5 DS1PRA DEFAULT N 0)** **(6 DS1 DEFAULT N) (7 DS1 DEFAULT N)** **(8 DS1 DEFAULT N) (9 DS1 DEFAULT N) $**				

ADJNODE table

Step 8: ADJNODE Define the connection type and software version of adjacent nodes.

Note 1: The maximum number of tuples is 4096.

Note 2: The tuple in this table can be used by many different TKSGRP entries.

Field	Entry	Description	Requirements	Comments
ADJNODEK	alphanumeric (up to 12 characters)	adjacent node key--enter the names for each adjacent switch	It is recommended that you use type and version to identify the adjacent switch.	Referred to in table TRKSGRP, field ADJNODE.
SIGDATA	PRA	=PRODUCT + VERNUM subfields	Enter PRA for a PRI trunk.	
PRODUCT	For PRI: DMS, SL1, OTHER	adjacent switch type		
VERNUM	0 to 32767	software version in adjacent switch	Eliminate the decimal if used. This field must be updated if the software is updated in the adjacent node.	Use the BCS for DMS nodes; use the release number for SL-1s.
Example: **PRASL115 PRA SL1 28**				

TRKSGRP table

Step 9: TRKSGRP Define the D-channel for the trunk group.

Note:Table size is automatically set at two times the number of trunk groups. Maximum size: 2048 trunk subgroups.

Field	Entry	Description	Requirements	Comments
SGRPKEY		=CLLI + SGRP subfields		To configure ITA on the DTCI, datafill the non-PRI trunk subgroups in table TRKSGRP along with the PRI trunk subgroups.
CLLI		CLLI trunk group name		
SGRP	0	subgroup#		Only one subgroup (subgroup 0) is allowed per PRI interface.
CARDCODE	DS1SIG	card code	DS1SIG is required for ISDN PRI.	
SGRVAR		= subfields SIGDATA through DCHBCKUP below.		

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
SIGDATA	ISDN	The call processing protocol	ISDN is the only valid field for a PRI trunk.	This entry determines what fields appear.
PSPDSEIZ	2-30	the time in seconds that the trunk must wait to receive the first digit		Applies only to inband DTMF digits.
PARTDIAL	2-30	the time in seconds that the trunk must wait to receive each digit after the first digit		Applies only to inband DTMF digits.
VERSION	87Q931	the D-channel protocol version	This is the only value supported.	
CRLENGTH	2	Call reference length (# of octets)	The only value supported is 2.	
BCHNEG	Y or N	Allow B-channel negotiation (Y) or disallow (N).	The only value supported is N.	Not currently supported.
BCHGLARE	YIELD or STAND	The near end has priority in call collisions (STAND) or the far end has priority (YIELD).		When a call collision occurs, an entry of YIELD causes the call to be taken down and another trunk is selected.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
IFCLASS	NETWORK or USER	The interface class defines the ends of the link for PRI message exchange.	The SL-100 is always USER with the following exceptions: For SL-100 «»SL-100 one end must be USER and the other end must be NETWORK. For SL-1 «»SL-100, the SL-100 is NETWORK; the SL-1 is USER.	USER always yields to NETWORK.
CONFIG	PT_PT	the broadcast procedure for the PRI interface	PT_PT is the only option supported by PRI.	Broadcast links (PT_MLT_PT) are used with BRA only.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
LOCATION	USER	the Q.931 Progress Indicator (PI IE) location		The far end should be datafilled according to equipment type: LOCALEO for DMS-100 ; USER for SL-1 or SL-100, or PVTNET for DMS-250.
SAT	Y or N	satellite switched -- yes (Y) or no (N)	N is the only value supported.	
ECSTAT	INTERNAL, EXTERNAL, INNOTONE, UNEQ	echo canceller status	Enter INTERNAL when the echo cancellers are equipped on the NT6X50EC card in the DTCI frame and are enabled by call processing when the call is not a data call. This value is not allowed when echo suppressor is enabled. Enter EXTERNAL when echo cancellations are performed by external equipment and no call processing is involved. Use INNOTONE when internal echo cancellers are to be used but the 2100 Hz tone is turned off. This value is not allowed when echo suppressor is enabled. Enter UNEQ when no echo cancellers are equipped on this subgroup.	

TRKSGRP table (continued)

Step 9: TRKSGRP Define the D-channel for the trunk group (continued).

Field	Entry	Description	Requirements	Comments
TRKGRDTIM	1-**30**-255	trunk guard timer in units of 10 msecs--this is the time that the trunk waits after sending a DISCONNECT message and before putting the trunk into IDLE.	For PRI, a minimum value of 30 (300 msec) is recom-mended.	If the timer expires again after a second disconnect attempt, the B-channel is put into LO state until a restart procedure is completed.
ADJNODE	alphanumeric (up to 12 characters)	index into table ADJNODE.	Same as ADJNODEK in table ADJNODE.	
L1FLAGS	Y or N	Indicates whether or not the DTCI sends Layer 1 flags when the D-channel is in flagfill mode.	Enter N for DMS-to-DMS connections and Y for DMS-to-other vendor connections.	
DCHNL		the primary D-channel for this PRI interface; it includes subfields PMTYPE through HDLCTYPE below.		This field cannot be changed or deleted unless the D-channel is in INB state.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
PMTYPE	DTCI	PM type	Use DTCI for BCS 30 and later.	
DTCINO	0-511	DTCI PM#		
DTCICKTNO	0-19	DS-1 span on the DTCI for the D-channel		
DTCICKTTS	1-24	DS-1 timeslot for the D-channel		
DCHRATE	64K or 56K	D-channel transmission rate	See *SL-100 datafill*, *PRI datafill dependencies*, table 24.	The D-channel rate should match the data rate datafilled for the DS-1 carrier.
HDLCTYPE	HDLC or INVHDLC	Indicate the bit format for PRI messages as follows: HDLC for High Level Data Link or INVHDLC for inverted HDLC.	See *SL-100 datafill*, *PRI datafill dependencies*, table 24.	INVHDLC is a format in which all 0's are changed to 1's and vice versa. Some ISDN vendors use INVHDLC for PRI.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

DCHBCKUP	the backup D-channel. It includes subfields PMTYPE through HDLCTYPE above.	Not currently supported. Enter a $ for BCS30.
Example: **K2CPR64CL 0 DS1SIG ISDN 10 20 87Q931 2 N STAND +** **NETWORK PT_PT USER N UNEQ 30 PRASL115 DTCI 10 0 24 64K HDLC $**		

TRKMEM table

Step 10: TRKMEM Define the B-channels for the trunk group.

Note: Table size is automatically determined according to field TRKGRPSIZ in table CLLI for each trunk group configured.

Field	Entry	Description	Requirements	Comments
CLLI		CLLI name for the trunk group	Must match trunk group name in CLLI table.	
EXTRKNM	0-9999	the external trunk#	The first digit in the tuple should be the same as the channel# to ensure correct trunk selection.	
SGRP	0	trunk subgroup#	Same as SGRP in table TRKSGRP.	Always 0 for PRI trunks.
MEMVAR		= subfields PMTYPE + DTCNO + DTCCKTNO + DTCCKTTS		
PMTYPE	DTCI	PM type		
DTCNO	0-511	DTCI# for the trunk group	Must match DTCINO in table TRKSGRP.	The B-channels must be on the same DTCI as the D-channel.
DTCCKTNO	0-19	DS-1 span on the DTCI for the B-channel	This carrier must be datafilled in LTCPSINV as DS1PRA.	
DTCCKTTS	1-24	DS-1 timeslot for this trunk member		

TRKMEM table (continued)

Step 10: TRKMEM (continued).

Field	Entry	Description	Requirements	Comments
Example:				
K2CPR64CL	**1 0 DTCI 10 0 1**			
K2CPR64CL	**2 0 DTCI 10 0 2**			
K2CPR64CL	**3 0 DTCI 10 0 3**			
To configure ITA on the DTCI, datafill non-PRI trunk members along with PRI B-channels.				
Examples:				
K2KPRA64CL	**1 0 DTCI 10 0 1**			
K2KPRA64CL	**2 0 DTCI 10 0 2**			
K2KPRA64CL	**3 0 DTCI 10 0 3**			
K2KABTRK1	**1 0 DTCI 10 0 4**			
K2KABTRK1	**1 0 DTCI 10 0 5**			

LTDEF table

Step 11: LTDEF Define the logical terminal (LT) and access privileges.

Field	Entry	Description	Requirements	Comments
LTKEY		LTID	Same as LTID in table LTDATA.	The LT group of the LTID must first be datafilled in LTGRP if anything other than ISDN is used.
LTAP	B	LT access privileges	Enter B for PRI (circuit-switched).	
CLASSREF		= subfield LTCLASS		
LTCLASS	PRA	the LT class		Defines the fields required and the services allowed.
NUMBCHNL	1-479	the # of B-channels in the trunk group		
NUMCALLS	1-479	the # of calls allowed on the LTID at one time	This entry should be the same as the NUMBCHNL entry. The sum of the incoming calls and outgoing calls must be less than or equal to the number of calls allowed.	
INCCALLS	0-479	the # of reserved incoming-only calls allowed on the LTID at one time		Not used; enter any number.

LTDEF table (continued)

Step 11: LTDEF (continued).

Field	Entry	Description	Requirements	Comments
OUTCALLS	0-479	the # of reserved outgoing-only calls allowed on the LTID at one time		Not used; enter any number.
OPTIONS	vector with up to 4 members: NOVOICE, NOVBD, NOCMD, NOPMD	Defines the bearer capabilities for the LTID. It defines the types of calls not allowed: NOVOICE for no voice calls, NOVBD for no voice-band data calls, NOCMD for no circuit-mode data calls, and NOPMD for no packet-mode data calls.	Enter NOPMD for this BCS.	Applies to incoming and outgoing calls.
Example:				
ISDN 555 B PRA 5 5 1 1 NOPMD $				

LTDATA table

Step 12: LTDATA Specify additional service-related data for the LTID.

Field	Entry	Description	Requirements	Comments
LTID		= subfields LTGRP +LTNUM	Same as LTKEY in table LTDEF.	
LTGRP	ISDN	the LT group type		Non-ISDN groups can be datafilled if table LTGRP is datafilled first.
LTNO	1-1022	LT# within the group		
DATATYPE	NIL, DN, or SERV	data type for the services associated with this LTID		
When DATATYPE = DN, the following fields are required.				
DFLTCGN	10 digits: NPA + NNX + XXXX	The 10-digit DN (default) if no CGN is supplied on outgoing calls; with CGN screening, this DN is the only DN that can originate calls.	Appropriate digits must be datafilled in table THOUGRP.	Only one 10-digit number is supported. Also used for billing if the BILLDN field in table TRKGRP is Y.
OPTIONS	CUSTGRP	Select CUSTGRP option.	Enter $ if no options are required.	Only one entry allowed. Optional when DATATYPE=DN.
CUSTGRP	alphanumeric	Enter the customer group name.		

LTDATA table (continued)

Step 12: LTDATA (continued).

Field	Entry	Description	Requirements	Comments
When DATATYPE = SERV, the following fields are required.				
AUDTRMT	N or Y	Audible treatments; specify whether inband tones and announcements should be provided instead of “disconnect with cause” for treatments from this LTID.		
CGNREQD	N or Y	Specify whether CGN must be provided by the calling user switch.		
CGNDELV	NEVER, SCREENED, ALWAYS	Specify when the CGN must be provided.	Use SCREENED when the CGN should not be sent (it is screened for privacy).	
CDNDELV	NEVER or ALWAYS	Specify whether the CDN must be delivered to the called interface.		
OPTION	TBO or CHG	Specify the terminating billing option for the trunk CLLI or the charge number in calling number digits when no calling number is available.		Up to two entries allowed.

LTDATA table (continued)

Step 12: LTDATA (continued).

Field	Entry	Description	Requirements	Comments
CALLCODE	800-999	Enter a generic call code in this range.		Required when OPTION = TBO.
SFPRNT	N or Y	Specify whether the service feature is present or not.		Required when OPTION = TBO.
SFEATVAL	800-999	Enter a service feature value.		Required when SFPPRNT = Y.
Example: **ISDN 555 DN 6137221234 $**				

LTCALLS table

Step 13: LTCALLS Provides the initial translations associated with the call type.

Field	Entry	Description	Requirements	Comments
LTID		the LTID from table LTDATA		
CALLTYPE	PUB, PVT, WATS, INWATS, FX, or TIE.	Defines the call type allowed on this PRI interface.		If XLARTSEL = XLALEC, the following call types are not valid: PVT, INWATS, and TIE.
XLARTSEL		= subfield XLARTE		
XLARTE	XLAIBN, XLALEC, or RTEREF	The translation route selector: XLALEC for POTS, PBX, or Centrex; XLAIBN for PBX or MDC only; or RTEREF, which refers to a specific table and index, such as OFRT or IBNRTE.		Only one selector is allowed. This entry determines what other fields are required. If CALLTYPE = PRIVATE, XLALEC is not allowed.
When XLALEC is entered, the following fields are required:				
LINEATTR	0-1023	index to table LINEATTR		Used to index table LINEATTR for public calls.

LTCALLS table (continued)

Step 13: LTCALLS Provides the initial translations associated with the call type (continued).

Field	Entry	Description	Requirements	Comments
When XLAIBN is entered, the following fields are required: • If CALLTYPE = PUB, then the LINEATTR index is used to index table LINEATTR. • If CALLTYPE = PVT, then CUSTGFP, SUBGRP, and NCOS are used to index IBNXLA.				
LINEATTR	0-1023	index to table LINEATTR		Used to index table LINEATTR for public calls.
CUSTGRP	alphanumeric	customer name associated with an IBN station.		
SUBGRP	0-7	The subgroup number for the CUSTGRP.		
NCOS	0-255	The network class of service, which defines access privileges for the user.		
When RTEFEF is selected, the following fields are required (CALLTYPE is irrelevant):				
RTEID	OFRT or IBNRTE and a number from 1 to 1023	the routing table and index into that table		
OPTIONS	$		Enter $.	Not used in this BCS.
Example: **ISDN 555 PUB XLAIBN 52 $**				

LTMAP table

Step 14: LTMAP Map the LTID to the CLLIs of the PRI trunk groups.

Field	Entry	Description	Requirements	Comments
LTID		LTKEY from table LTDEF indexes this table.		Automatically updates LTID field in table TRKGRP
MAPTYPE	CLLI			Always set to CLLI for PRI.
CLLI		the CLLI name for the trunk group	Must match CLLI name in table TRKGRP.	
OPTIONS	TEI 0	ISDN terminal equipment identifier	Enter TEI 0 for every LTID entry.	TEI is the only supported option for PRI.
Example: **ISDN 555 CLLI K2CPR64CL TEI 0 $**				

CUSTNWK table

Step 15: CUSTNWK Define the customer networking features, including the display.

Note: Table CUSTNTWK is a table within table CUSTENG.

Field	Entry	Description	Requirements	Comments
CUSTNAME	alphanumeric (up to 16 characters)	customer group name	Must match CUSTNAME in table CUSTENG	
NETNAME	PUBLIC	the network assigned to customer group	Use PUBLIC for SL-100.	
NETCGID	1-4096	network customer ID#	Use 1 for SL-100.	
DNREVXLA	$	DN reverse translators	Use $ for SL-100.	
OPTIONS	CLID or NTWKRAG	MCDN feature options		
CLIDOPT	ONNET or OFFNET	Calling line ID options.	Enter OFFNET to enable the NETCGID on all networks.	
Example: **GRP1 PUBLIC 1 $ CLID OFFNET**				

Routing tables

The SL-100 uses the following routing tables for basic call service or ESN over PRI: IBNRTE, RTEREF, and OFRT.

- OFRT provides the routing for IBN and POTS calls
- IBNRTE provides the routing for IBN calls.
- HNPACONT.RTEREF provides the routing for local calls
- FNPACONT.RTEREF provides the routing for toll calls

There are no changes to these tables for dedicated trunk routing.

- For ISA routing refer to NTP 555-8001-102.

IMPORTANT: These tables must be datafilled before datafilling table LTCALLS.

Configuring backup trunk groups

Because the DTCI also supports non-PRI trunks, backup trunk groups can be configured on the same DTCI. The backup trunk group can be configured as a single two-way trunk group or as two two-way trunk groups.

The following example tuple for table OFRT shows how this can be implemented.

Table OFRT tuple:

99	**S**	**N**	**N**	**N**	**DMS2MSLPRA**
	S	**N**	**N**	**N**	**DMS2MSLDAL**

In this example, when a user dials the code for the PRI trunk, the call is routed using route OFRT 99. Calls are first offered via the PRI group DMS2MSLPRA. If this trunk group is 100% busy, out of service, or experiences protocol failure during the call setup, the call is re-offered on the DAL trunk DMS2MSLDAL. Calls incoming on DMS2MSLDAL should be handled the same way as calls incoming on DMS2MSLPRA.

PRI datafill dependencies

The datafill entered for table CARRMTC must be consistent with the datafill in table TRKSGRP.

Table 24
SL-100 PRI datafill dependencies

CARRMTC table					***TRKSGRP table***	
CARD	**FF**	**ZLG**	**BERB** *(note 1)*	**DLK** *(note 2)*	**DCHRATE**	**HDLCTYPE**
NT6X50AA	SF	ZCS	BPV	NILDL	56K or 64K	HDLC or INVHDLC
NT6X50AB	SF	ZCS	BPV	NILDL	56K or 64K	HDLC or INVHDLC
		B8ZS	BPV	NILDL	64K	HDLC or INVHDLC
	ESF	ZCS	CRC	NILDL	56K or 64K	HDLC or INVHDLC
		B8ZS	CRC	NILDL	64K	HDLC or INVHDLC

Note 1: When CRC is entered, both BPV and CRC are used.

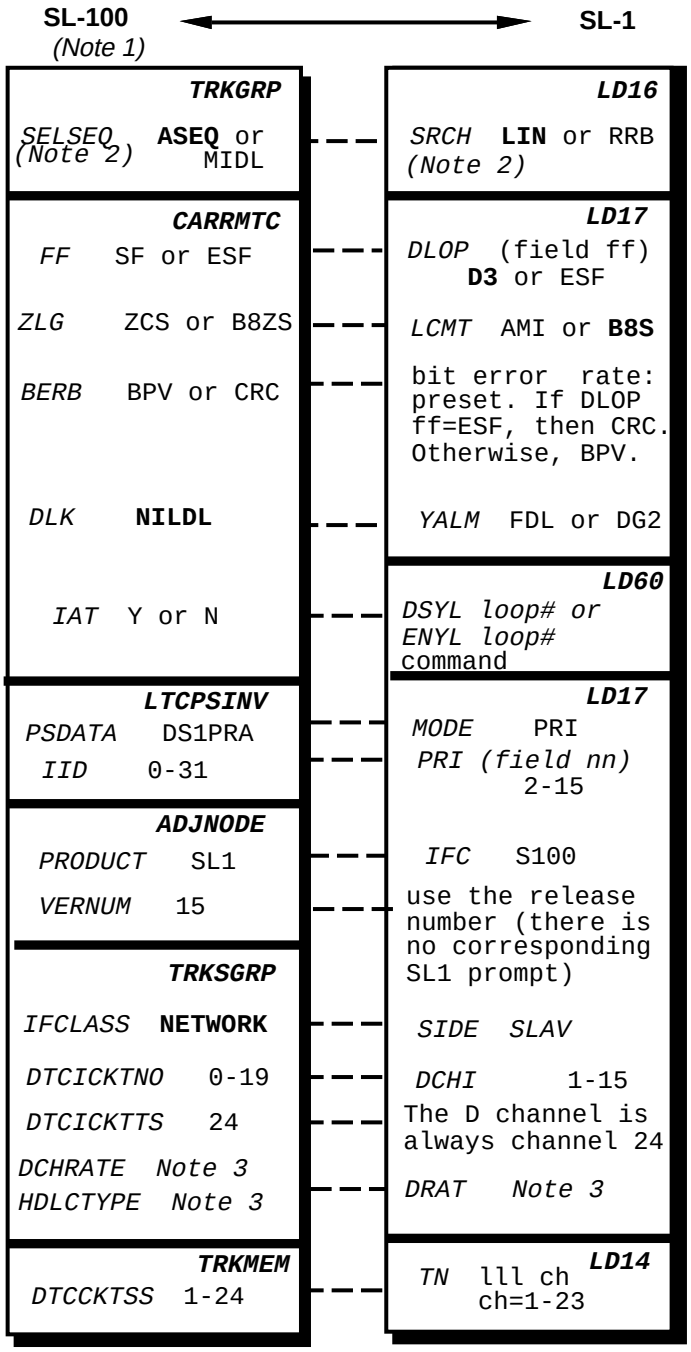
Note 2: DLK is used for transmitting yellow alarm. Use NILDL for nil data link, use FLD1 for input from timeslot 2, or FLD2 for input from external interrupt. Currently, only NILDL is supported.

Correlation tables

The correlation tables that follow show the parameters that must be coordinated between the near and far end for network service.

Note: Because ISDN is an evolving architecture, there may be some differences in datafill between different product types.

SL-100 to SL-1 correlation table



Note 1:
Refer to *SL-100 datafill*, *PRI datafill dependencies* for required consistencies in the PRI interface.

Note 2:
The following combinations are valid:

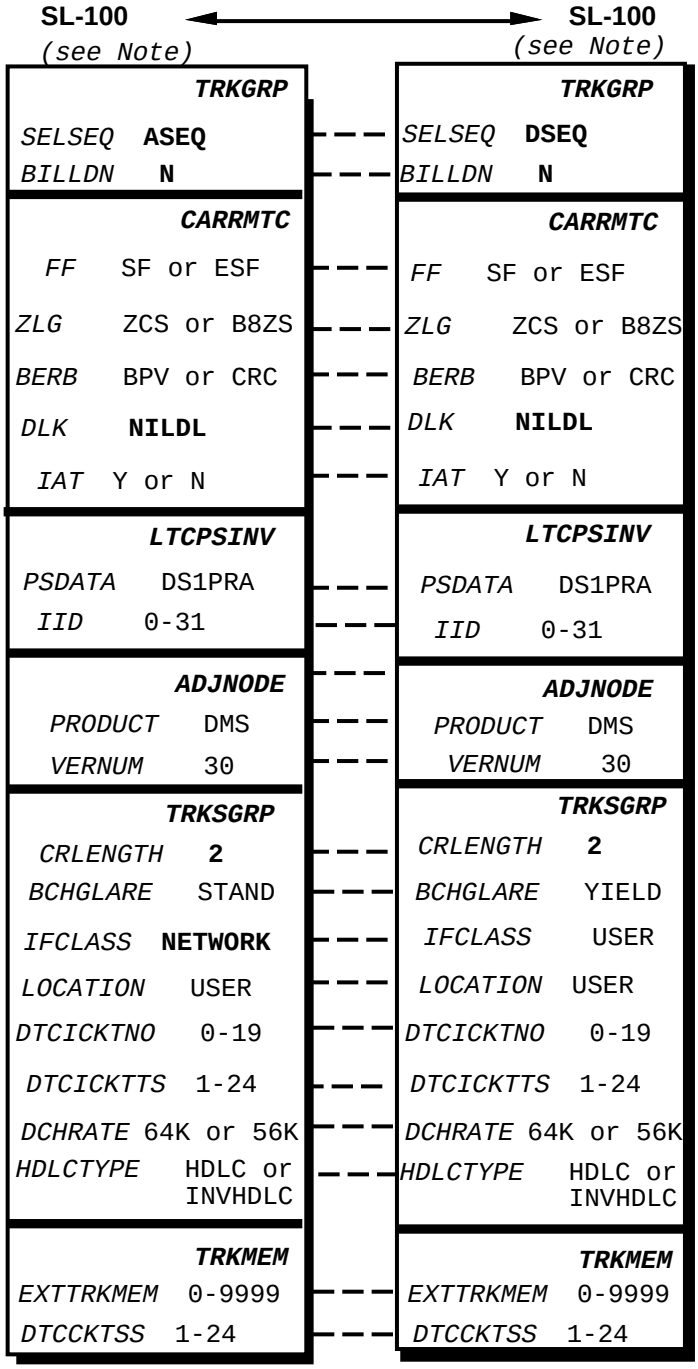
SL-100	SL-1
ASEQ	LIN
MIDL	RRB

Note 3:
The following combinations are valid:

SL-100		SL-1
DCHRATE	*HDCLTYPE*	*DRAT*
56K	HDLC	56K
64K	HDLC	64KC
64K	INVHDLC	64KI

Key
Prompts appear in *italics.*
Default appears in **boldface.**

SL-100 to SL-100 correlation table

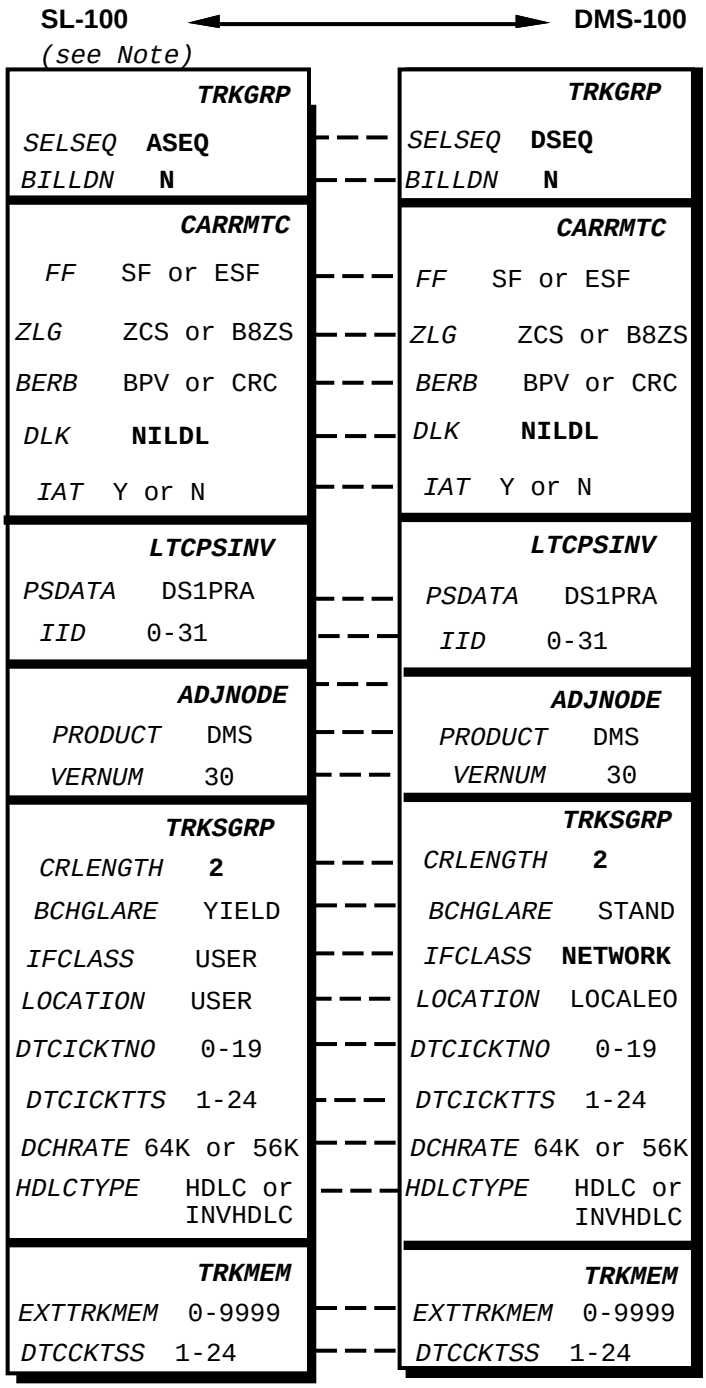


Note:

Refer to *SL-100 datafill* , *PRI datafill dependencies* for required consistencies in the PRI interface.

Key
Prompts appear in *italics.*
Default appears in **boldface.**

SL-100 to DMS-100 correlation table

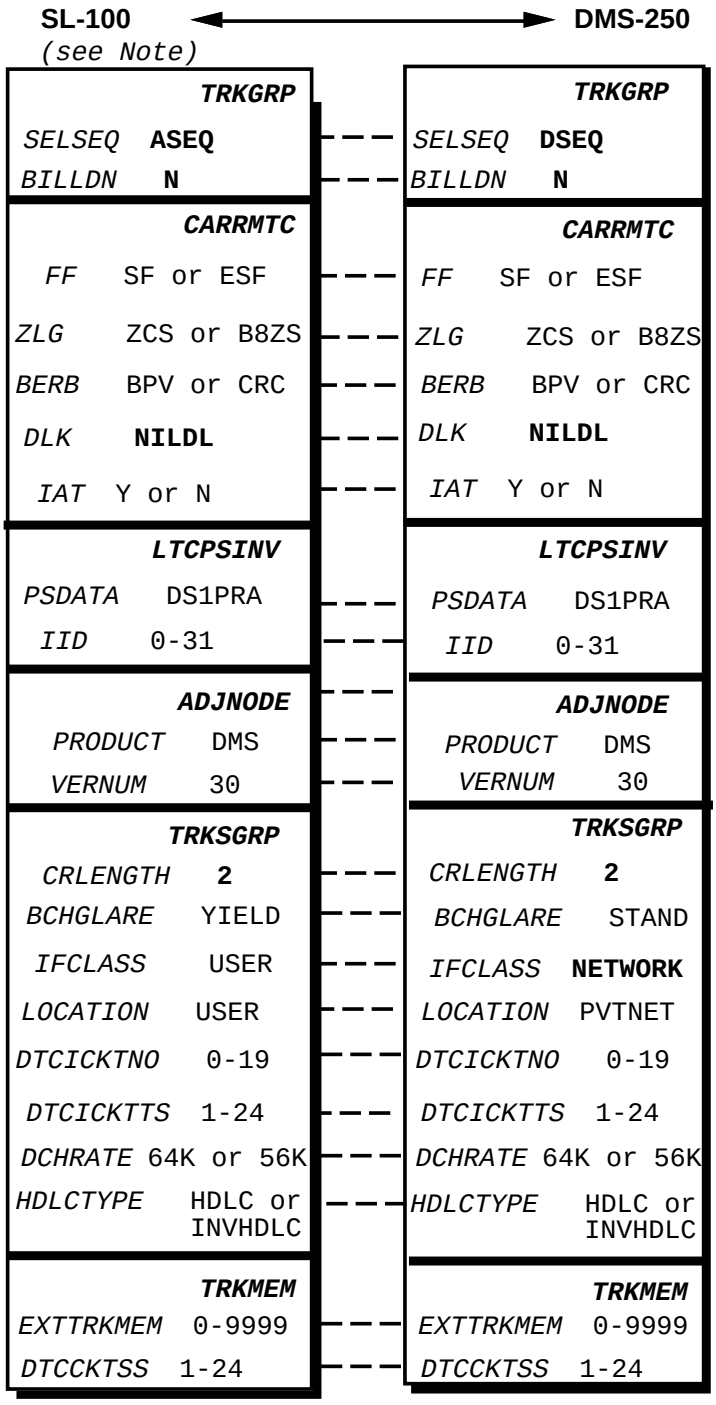


Note:

Refer to *SL-100 datafill* , *PRI datafill dependencies* for required consistencies in the PRI interface.

Key
Prompts appear in *italics.*
Default appears in **boldface.**

SL-100 to DMS-250 correlation table



Note:

Refer to *SL-100 datafill* , *PRI datafill dependencies* for required consistencies in the PRI interface.

Key
Prompts appear in *italics.*
Default appears in **boldface.**

Bearer services datafill considerations

Bearer capability (BC) screening ensures that calls are connected only between compatible terminals. Tables BCDEF, BCCOMPAT, KSETFEAT, and LTDEF are datafilled to provide the necessary BC parameters:

- Table BCDEF defines the different BCs available.
- Table BCCOMPAT defines what BCs are compatible with one another.
- Table KSETFEAT associates the call (by terminal type) with the bearer capability desired.
- Table LTDEF (for the LTID OPTIONS) defines which BCs are allowed to terminate on a specific PRI trunk group.

These tables must be datafilled for basic call service to work correctly.

Datafill presentation

In the following datafill tables, defaults are presented in **boldface**. Example tuples are presented at the end of a table. An example that is one continuous record may be shown on more than one line due to space limitations. Not all fields in a table may be shown. Only those fields important to bearer services are presented.

Important datafill considerations

The datafill for the bearer service tables can be altered if required, with the following exceptions:

- BCs mapped to themselves in table BCCOMPAT cannot be deleted.
- To change a BC of a device in table KSETFEAT, the BC name as defined in table BCDEF must be entered in the OPTIONS field. If the BC OPTIONS is not used, a default BC will be used.

  Note: All non-ISDN sets (500/2500 sets, EBSs, and ACs) are assumed to have SPEECH BC.

Bearer services datafill considerations (continued)

Default BC summary

The default values associated with tables BCDEF, BCCOMPAT, and KSETFEAT are summarized in Table 25. The OPTIONS field in table LTDEF is described in *LTDEF table* in the *SL-100 PRI datafill* section.

Table 25
SL-100Default BC summary

Device	Encoded BC	Compatible Incoming BC
500/2500	SPEECH	SPEECH/3_1KHZ
P-phone	SPEECH	SPEECH/3_1KHZ
Attendant	SPEECH	SPEECH/3_1KHZ
ADM/SADM/DTI	56KDATA	56KDATA
HSDU	56K/64KDATA	56K/64KDATA (Note 1)
LSDU	19.2KDATA	19.2KDATA
DTI/TRK	SPEECH	SPEECH/3_1KHZ
MODEM PHONE	3_1KHZ	3_1KHZ (Note 2)
ISDN BRAKS	SPEECH	SPEECH/3_1KHZ
ISDN BRAKS	56K/64KDATA	56K/64KDATA (Note 3)

Note 1: Although the BC for data units is sent out as 56K in the call processing messages, this BC can accommodate 56K or 64K data rates. If 64K is to be used, datafill table KSETLINE for 64KDATA.

Note 2: An ISDNKSET is BC datafilled as 3_1KHz.

Note 3: 56KDATA or 64KDATA must be datafilled in table KSETFEAT for an ISDN BRAKS.

Bearer services datafill sequence

Table 26 shows the datafill sequence for the bearer service tables.

- Table LTDEF, field OPTIONS, is datafilled as part of the Service Tables datafill sequence.
- Table BCDEF must be datafilled before table BCCCOMPAT

Table 26
SL-100 BC datafill sequence

		Initial install	Add a trunk mem-ber	Add DS-1 span	Add a C-side link
1. BCDEF	Define the available BCs.	X			
2. BCCOMPAT	Define what BCs are compatible with one another.	X			
3. KSETFEAT	Assign a bearer capability to the terminal type.	X			

BCDEF table

Table BCDEF contains five default bearer capabilities that are available for PRI, datafilled as follows in Table 27. One of these values should be used to define the BC for the line or logical terminal. If a BC other than these five is received, the call is rejected.

Table 27
Default BCDEF summary

Field	Default Bearer Capabilities for PRI (see note)				
BCNAME	SPEECH	64KDATA	64KREST	56KDATA	3_1KHZ
XFERCAP	SPEECH	UNRESDIG	RESDIG	UNRESDIG	3_1KHZ
XFERMODE	CIRCUIT	CIRCUIT	CIRCUIT	CIRCUIT	CIRCUIT
CODINGST	CCITT	CCITT	CCITT	NETWORK	CCITT
PROTOTYP				DTU	
PROTOCOL				NONE	
SYNC				Y	
DATARATE				56 Kbps	
DISCRIM					
Note: Blank fields indicate that that parameter does not apply; those fields that do not apply are not prompted for.					

If it is necessary to change this table, the fields may be datafilled as in table 27a below.

Note:This table must be defined before table BCCOMPAT is defined.

Field	Entry	Description	Requirements	Comments
BCNAME	alphanumeric (up to 7 characters)	bearer capability name		A maximum of 59 BCs may be defined.
BCDATA		= subfields XFERCAP + XFERMODE + CODINGST		

BCDEF table (continued)

)

Field	Entry	Description	Requirements	Comments
XFERCAP	SPEECH, UNRESDIG, RESDIG	the type of data being trans-mitted: SPEECH is for voice calls, UNRESDIG is for packet mode calls, and RESDIG is for 56 Kbps data calls		
XFERMODE	CIRCUIT, NETWORK	transmission mode		
CODINGST	CCITT, NETWORK	the coding standard for BC: CCITT or a network-specific coding standard.		This selector determines what other fields are required.
When CODINGST = NETWORK, the following fields are required:				
PROTOTYP	MODEM, DTU, OTHER	the physical device at the endpoint determines the protocol used.		
When PROTOTYP = MODEM, the following fields are required:				
MODEMPRO	alphanumeric	Identify the modem protocol.	The name used must be defined in table MODEMPRO.	
MODEMSNC	Y or N	synchronous (Y) or async (N) communications		

BCDEF table (continued)

Field	Entry	Description	Requirements	Comments
MODEMRTE	75BS, 150BS, 300BS, 600BS, 1200BS, 2400BS, 3600BS, 4800BS, 7200BS, 8KBS, 9600BS, 14400BS, 16KBS, 19200BS, 32KBS, 48KBS, 56KBS, AUTO	modem data rate		
When PROTOYPE = DTU, the following fields are required:				
DTUPRO	alphanumeric	protocol name	Must be defined in table DTUPRO.	
DTUSYNC	Y or N	synchronous (Y) or async (N) communications		

BCDEF table (continued)

Field	Entry	Description	Requirements	Comments
DTURATE	75BS, 150BS, 300BS, 600BS, 1200BS, 2400BS, 3600BS, 4800BS, 7200BS, 8KBS, 9600BS, 14400BS, 16KBS, 19200BS, 32KBS, 48KBS, 56KBS, AUTO	modem data rate		
When PROTOYPE =OTHER, the following fields are required:				
DISCRIM	0-63	Identifies OTHER devices		
Example:				
SPEECH	**SPEECH**	**CIRCUIT**	**CCITT**	
64KDATA	**UNRESDIG**	**CIRCUIT**	**CCITT**	
3_1KHZ	**SPEECH**	**CIRCUIT**	**CCITT**	
DATAUNIT	**RESDIG**	**CIRCUIT**	**NETWORK**	**DTU** **TLINK** **Y** **AUTO**

BCCOMPAT table

Table BCCOMPAT controls the mapping of BC compatibilities. This table shows the mapping of default BCs provided in table BCDEF. Other BC pairs can be mapped, provided they are first defined in table BCDEF.

Note: These tuples are entered at load build time. A maximum of 3906 BC pairs may be mapped.

Field	Entry	Description	Requirements	Comments
KEY		**=** subfields CALLBC and TERMBC		Used to define compatible combinations. By default, any bearer capability is compatible with itself-no tuples need be entered. For bi-directional compatibility, two tuples must be defined.
CALLBC		BC name	Must be defined in BCDEF.	
TERMBC		BC name	Must be defined in BCDEF.	
Example: **64KRES DATAUNIT** **DATAUNIT 64KRES**				

KSETFEAT table

The BC feature is assigned in table KSETFEAT. This table lists the line features assigned to the business sets, data units, and ISDN terminals listed in the KSETLINE table.

- All non-ISDN sets (500/2500 sets, EBSs, and ACs) are assumed to have SPEECH BC.
- SPEECH is used if a data terminal is attached to a terminal adapter.
- ISDN terminals do require a BC because they have the ability to screen incoming calls on the basis of information sent to them by the network. They use the BC assigned to that LTID in table LTDEF.

To change the BC assigned to a terminal in KSETFEAT, the BC feature must be selected and the BC name (as defined in table BCDEF) is entered . If the BC is not defined, a default BC is used.

Field	Entry	Description	Requirements	Comments
FEATKEY	= subfields LTGRP + LTNUM + KEY + FEAT			
LTGRP		logical terminal group		
LTNUM		logical terminal number		
KEY	1-69	Enter the number associated with the DN appearance to which the feature is being assigned.		For M2317 telephones, only keys 1-11 can be used.
FEAT	BC	selects BC option		
KVAR		= subfield FEAT + BCNAME		
FEATURE	BC	enter BC feature		

KSETFEAT table (continued)

Field	Entry	Description	Requirements	Comments
BCNAME	SPEECH, 64KDATA, 56KDATA, DATAUNIT, 3_1KHZ, or 64KRES	the bearer capability associated with this line or LTID.		The 64KX25 BC does not apply to basic call.
Example: **ISDN 555 8 BC BC 64KDATA**				

ESN TCOS to NCOS mapping

Table 28 shows the datafill to be used for TCOS compatibility between two SL-100s. These parameters are datafilled in table COSDATA.

- Mapping TCOS to NCOS is one-to-one, i.e., the 0-255 NCOSs are mapped one-to-one to 0-7 TCOSs.
- Mapping NCOS to TCOS involves an algorithm that transforms the TCOS value to a number between 0 and 7 for all NCOSs over 7.

Table 28
TCOS to NCOS mapping

COSNAME	NCOS	TCOS
ETN	0	0
ETN	1	1
ETN	2	2
ETN	3	3
ETN	4	4
ETN	5	5
ETN	6	6
ETN	7	7
ETN	8	0
ETN	9	1
. . . and so on.		

Operational measurements DS1CARR OMs

The DS1CARR OMs monitor the performance of DS-1 lines for each carrier. This OM group has replaced the CARR OM group. Provisioning for the registers in the DS1CARR group is per DS-1 carrier.

> ***Note:*** These OMs correspond to Layer 1 (physical layer) in the Open Systems Interconnection (OSI) model.

The following OM pegs are accumulated for each DS-1 carrier for 24 hours and are reset when DS1LOF and DS1SLP are reset.

- DS1OMINFO Key to digital carrier equipment table
- DS1LCGA DS-1 local carrier group alarm
- DS1RCGA DS-1 remote carrier group alarm
- DS1BER DS-1 bit error rate maintenance or out-of-service limits exceeded
- DS1LOF DS-1 framing lost on the incoming side
- DS1SLP DS-1 frame slip
- DS1SBU DS-1 carrier busied out by system-originated commands
- DS1MBU DS1 carrier busied out by commands from the MAP
- DS1CBU DS-1 carrier in CSBY state (DTCI out of service)
- DS1PBU DS-1 carriers in PSBY state
- DS1BER DS-1 bit error ratio (replaces DS1BPV)
- DS1ES DS-1 error second
- DS1SES DS-1 severe error second
- DS1UAS DS-1 unavailable second

DCH OMs

The PRADCHL2 group contains the OMs for the D-channel signaling link (Layer 2 protocol). This OM group is pegged in the DTCI and collected from the PM just before the OM transfer from the active to the holding registers.

Note: These OMs correspond to Layer 2 (link layer) in the Open Systems Interconnection (OSI) model.

PRADCHL2 registers are as follows:

- PRDDISCT Count of discarded transmit frames accumulated during one minute.
- PRDS0RX Count of successfully received SAPI 0 (circuit-switched data) frames accumulated over one minute.
- PRDRNRRX Count of RNR (Receiver Not Ready) frames received from peer accumulated over one minute.
- PRDCRC Count of frames received with CRC (Cyclic Redundancy Check) errors, accumulated over one minute.
- PRDSBMTX Count of link resets caused by ISP accumulated over one minute.
- PRDREJTX Count of REJ (Reject) frames transmitted by ISP.
- PRDDISCR Count of received frames discarded due to other errors, accumulated over one minute.
- PRDSBMRX Count of link resets caused by peer accumulated over one minute.
- PRDS0TX Count of successfully transmitted SAPI 0 (circuit-switched data) frames accumulated over one minute.
- PRDRNRTX Count of RNR (Receiver Not Ready) frames transmitted by ISD to peer accumulated over one minute.

TRK OMs

TRK OMs monitor call processing performance of the trunk group. Provisioning for the registers in the TRK group is per trunk group.

> ***Note:*** These OMs correspond to Layer 3 (network layer) in the Open Systems Interconnection (OSI) model.

The following OM pegs are accumulated over 24 hours and are reset when DS1LOF and DS1SLP are reset.

- OM2TRKINFO Trunk information fields: direction, total circuits,and working circuits
- INCATOT Incoming seizures
- PRERTEAB Abandoned incoming call attempts
- INFAIL Call origination attempts terminated unsuccessfully
- NATTMPT Calls routed to this trunk group
- NOVFLATB Call processing overflows
- GLARE Dropped calls due to glare
- OUTFAIL Unsuccessful outgoing seizures
- DEFLDCA Routed calls prevented from using this trunk group by network management
- DREU Directional reservation activated
- PREU Protective reservation activated
- TRU Trunks found in tk_cp_busy, tk_cp_busy_deload, and tk_lockout
- SBU Trunks found in tk_remote_busy, tk_pm_busy, tk_system busy, tk_carrier_fail, and tk_deloaded.
- MBU Trunks found to be in tk_man_busy, tk_seized, tk_nwm_busy.
- OUTMTCHF Incoming failures due to network blockage.
- CONNECT Outgoing seizures resulting in successful calls.
- TANDEM Incoming calls initially routed to an outgoing trunk group.
- AOF Incoming ANI failures (does not apply to PRI trunks).
- TOTU Sum of TRU, SBU, and MBU counts.

Treatment OMs

Treatment OMs monitor call processing performance of the trunk group. Treatments are routed to the originating PRI with the cause value in a DISC message.

Peg counts are accumulated according to five groups: Customer Unauthorized (CU), Customer Misc (CM), Equipment Related (ER), Feature Related (FR), Resource Shortage (RS). The treatments are mapped to these groups as follows (important items are in boldface):

- Customer Unauthorized: ADBF, ANBB, ANIA, CACE, CCNA, CCNV, CNDT, CNOT, D950, DACD, DCFC, **DNTR**, DODT, FDNZ, **FNAL**, HNPI, ILRS, INAC, INAU, INCC, IVCC, LCAB, MSCA, MSLC, N950, NACD, **NACK**, NOCN, ORSSRSDT, TDND, TESS, TINV, UMOB, UNCA, UNIN, UNOW, UNPR.
- Customer Misc: ANCT, ANTO, ATBS, ATDT, BLDN, BLPR, CFWV, DISC, OPRT, **PDIL**, **PSIG**, TDBR, TRBL, UNDN, UNDT, VACS, **VACT**, VCCT.
- Equipment Related: AIFL, **CONP**, ERDS, FDER, INOC, NCFL, NCUN, NMZN, NONT, PNOH, PTOF, RODR, SSTO, STOB, STOC, SYFL.
- Feature Related: **BUSY**, CCTO, CONF, MANL, MHLD, NCII, NCIX, NCTF, NINT, ORAC, ORAF, ORMC, ORMF, PGTO, PMPT, PRSC, RRPA, SRRR, TRRF.
- Resource Shortage: CGRO, CQOV, EMR1, EMR2, EMR3, EMR4, EMR5, EMR6, FECG, GNCT, **NBLH**, NBLN, **NCRT**, NECG, NOSC, **NOSR**, SORD, TOVD.

Basic call OMs

No OMs specific to Basic Call are provided in BCS 30. Use the trunk OMS to monitor call processing performance of the trunk group. There are no other PRI OMs that apply.

Logs

Table 29 lists the SL-100 logs that apply to DS-1 carriers.

Table 29
SL-100 logs

Report ID	Alarm Info	Event Type	Event ID	Equip Type	Equip ID
PM109	No change	SYSB Generated when SYSB due to loss of sync, remote alarms, or DS-1 card is removed.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM110	NOALARM	INFO Generated when BPV or SLIP, MTCE, or OOS limits are set or cleared, or when the DS-1 card fails maintenance or is replaced.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM111	NOALARM	INFO Generated when a system-busy carrier is returned to service.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM112	NOALARM	INFO Generated when a carrier slip counter is initialized.	CARRIER_SLIP_INIT	pmtype	pmnbr
PM186	NOALARM	INFO Generated as a general information log for carriers..	CARRIER CARRIER_NO: line_# REASON: char_string opt char_string	pmtype	pmnbr

Maintenance

Maintenance for the DTCI is the same as for the DTC. This section provides basic common maintenance procedures.

For successful call processing on the DMS-250 the following conditions must be met:

- The carrier must be in service (INSV).
- The PRI trunk must be in service (IDL).
- The calling and called lines must be in service (IDL).

DS-1 carrier alarms/display

Table 30 lists DS-1 carrier alarms that are displayed in the CARRIER level of the MAP. To access the carrier level of the MAP, use the following command:

MAPCI;MTC;TRKS;CARRIER

Alarms can be visual or audible alarms. The system provides automatic detection and recovery for most faults. If the system is able to recover, the alarm is cancelled and the event is entered into the system log.

The occurrence of errors is controlled by limits entered in table CARRMTC.

Table 30
SL-100 DS-1 carrier alarms/display

Message	Effects	Remedy
RCGA Remote carrier group alarm (Yellow alarm) FAR END FAULT	Indicates remote alarm detection in receive path. The yellow alarm counter is incremented by 1 for every 10 secs of remote alarm. when the counter reaches 34, the counter is no longer incremented and the trunk is removed from service.	Check the far end.
LCGA Local carrier group alarm (Red alarm) NEAR END FAULT	Indicates a DS-1 card or transmission fault for transmit path.The DS-1 is removed from service; remote alarm pattern sent to far end.	1. Ensure that transmission parameters are correctly set at both ends (see *Correlation tables*.). 2. Run a loopback test (see *Tests)*. 3. Run a continuity test (see *Tests*).
BER Approximated bit error rate. DS-1 DISPLAY	The counter is incremented for every 1K-bit errors per day. For ESF, both BPV and CRC errors are reported.	Alarm settings can be altered by changing table CARRMTC.

DS-1 carrier alarms/display (continued)

Table 30 (continued)
SL-100 DS-1 carrier alarms/display

FRME Frame loss error DS-1 DISPLAY	Counter is incremented for every 1K bit errors per day. If frame loss continues for 3 secs or more, the trunk is removed from service. It is restored automatically when frame sync is received continuously for 15 secs.	Alarm settings can be altered by changing table CARRMTC.
SLIP Frame slip (clock sync) error DS-1 DISPLAY	Counter is incremented per frame slip per day.	Alarm settings can be altered by changing table CARRMTC.
ES Errored seconds DS-1 DISPLAY		Alarm settings can be altered by changing table CARRMTC.
SES Severe errored seconds DS-1 DISPLAY		Alarm settings can be altered by changing table CARRMTC.
UAS Unavailable seconds		
State Carrier state DS-1 DISPLAY	Shows INSV, MANB, SYSB, UNEQ (trunks offline).	

DTCI commands

Table 31 provides the maintenance commands for the DTCI. This is the same set of commands as those used for the DTC.

Use the following MAP command to enter the DTCI level of the MAP:

MAPCI;MTC;PM;POST DTCI xx

Table 31
SL-100 DTCI maintenance commands

Command	Function
POST	Places the specified DTCI in the command position of the MAP.
LISTSET	Displays the current or all PMs in the post set.
TRNSL	Displays the status, message condition and capability of the C- or P-side links.
TST	Perform a controller self-diagnostic.
BSY	Busy the DTCI, one unit, or P-side link.
RTS	Return to service the DTCI, one unit, or P-side link.
OFFLINE	Put DTCI node offline (both DTCI must be in MANB first). **Note:** An off-line DTCI remains in this state over all restarts.
LOADPM	Load both units on the DTCI or select one unit (the unit being loaded must be in the BSY state first). The load file is from the CC.
DISPLAY	Displays the PM types and numbers associated with a particular state.
NEXT	Puts the next PM type in the posted set in the command position of the MAP.
QUERYPM	Displays the equipment location, load information, and the status of the DTCI.
QUERYPM FLT	Display the fault (if any) for each unit of the DTCI.
QUERYPM CNTRS	Display the name of the load for the DTCI.
SWACT	Causes an activity switch to the inactive unit of the DTCI.

DS-1 carrier commands

The carrier level performs all maintenance for PRI (DTCI) DS-1s. To access the carrier level of the MAP, use the following command:

MAPCI;MTC;TRKS;CARRIER; POST DTCI xx

The Display Option command displays the carrier options for the posted circuit, such as card code, options, and alarm thresholds.

A carrier can be looped towards the near (l) or far end (r) by using the following command. The loop is cleared using the (c) option.

LOOP n <l/c/r>

D- and B-channel commands

Although the PRADCH is designed mainly for D-channel maintenance, it can also be used for PRI B-channel maintenance (except for commands CONT and LOOPBK). B-channel maintenance can also use existing MMI commands.

Note: The control and post position displays are cleared when exiting the PRADCH level.

Use the following MAP command to enter the PRADCH level of the MAP:

MAPCI;MTC;TRKS;TTP;PRADCH

Note: The D-channel cannot be posted at the TTP level of the MAP. It must be posted from the PRADCH level under the TTP level. A B-channel can be posted at the TTP, MANUAL, MONITOR, or PRADCH level of the MAP.

Table 32
SL-100 PRADCH maintenance commands

Command	Function
POST	Post one or more DS-1 circuits for maintenance. The options supported are: **GD** < CCLI> (post by group--use D-channel CLLI), **BD** < CCLI> (post D and B-channels), **D DTCI** <DTCI#> (post by PM> **D DTCI** <DTCI# CKT> (post by circuit#) **D DTCI** <DTCI# CKT TS> (post by circuit and timeslot) **T** <CLLI> <MEM> (post by trunk member--for B-channels only) The STA (State) field shows the state of the D-channel.
BSY	Busy out a circuit or put a circuit in the INB state using BSY INB.
RTS	Return the specific channel to service. **Note:** If the DCH is INB, put the DCH in MB state with BSY before RTS.
NEXT	Put the next circuit in the post set in control position.
CONT	Run a continuity test on the a posted PRI D-channel (internal or external).
LOOPBK	Set loopback mode so that the far end is able to run an external continuity test.
HOLD	Place circuit in the hold position

DTCI states

Table 33 lists the possible states for the DTCI. Note that each unit of the DTCI has a separate state and both units can be in the same state. For the states OFFL and CBSY, both units will always be in the same state.

Table 33
SL-100 DTCI states

State	Description
CBSY	Both message links to network are out of service.
INSV	PM is in-service with no problems.
ISTB	One or both units installation busy PM overloaded PM load name does not match load name in LTCINV Static data mismatch CSlinks out of service Node redundancy lost Major CSlink failure Critical CSlink failure WARM SWACT turned off Warm SWACT not OK
MANB	Craftsperson has busied the PM.
OFFL	PM is off-line (software state).

DTCI states (continued)

Table 33 (continued)
SL-100 DTCI states

State	Description
SYSB	System busy during CC initialization Diagnostics failed All C-side links are down Reset while in-service Trap message received from PM Autonomous activity drop Unsolicited messages limit exceeded Self-test failed PM audit detect fault Inactive unit lost data sync REX in progress REX failed RTS failed PM SWACT CS cleared RTS Audit detected inconsistent PM activity Audit detected inconsistent PM state No response from XPM during audit Require data load RTS rippling from C-side Messaging fail Reset limit exceeded ESA translation data downloading failed Data message threshold exceeded SWER message threshold exceeded Fault msg threshold exceeded Load corruption suspected Data corruption suspected/detected Incoming message overload condition

DS-1 carrier states

Table 34 lists the possible states for the DS-1 carrier.

Table 34
SL-100 DS-1 carrier states

State	Description
MANB	Manual busy--DS-1 removed from service by craftsperson for maintenance.
INSV	DS-1 is in service; no alarms present.
OFFL	The DS-1 is offline.
SYSB	The DS-1 is system busy from a remote or local alarm.
UNEQ	The p-side port for the DTCI is unequipped (no datafill exists in table LTCPSINV). Any trunks datafilled for that facility will be offline.

D-channel states

Table 35 lists the possible states for the D-channels.

Table 35
SL-100 D-channel states

State	Description
CFL	Carrier fail--the carrier is out of service or SYSB.
INB	Installation busy--D-channel is configured in datafill but is not in-service.
INSV	D-channel is in service and available.
LO	Lockout--link level (layer 2) or physical level (Layer 1) failure.
MANB	Manual busy -- D-channel removed from service at the MAP.
PMB	Peripheral is MANB.
RNR	Remote not responding -- the link is established and ready but the far end is not responding to PRI messages.

B-channel states

Table 36 lists the possible states for the B-channels.

Table 36
SL-100 B-channel states

State	Description
CFL	Carrier failed -- associated DS-1 failure
CPB	Call processing busy--currently carrying traffic (service busy)
CPD	Call processing deload -- circuit carrying traffic but another entity, such as MTCE, has requested to be informed when CP releases circuit.
DEL	Deload -- CPD circuit is now available.
DFL	D-channel fail--the D-channel is not in service so no signalling for B-channels can take place.
DMB	D-channel manually busy -- the D-channel is MB.
IDL	Circuit in service and available; D-channel is in service.
INB	Installation busy -- circuit is installed but not yet in service.
INI	Initialized -- CPB circuits are initialized after a system restart
LO	Local failure of a circuit (no response from far end for this circuit).
MB	Manual busy -- circuit removed from service by craftsperson for maintenance.
NEQ	Not equipped -- circuit hardware not provided.
PMB	Peripheral manual busy -- the associated DTCI is out of service.
RMB	Remote manual busy -- trunk for incoming calls removed from service by far end.
SB	System busy -- circuit removed from service by system maintenance.
SZD	Seized -- circuit has been seized for manual or system action.

Tests

Table 37 below lists the tests for verifying network operation at the trunk or link level.

Be sure to BSY the PM at the DCTI level of the MAP before running the tests.

Table37
SL-100 tests

Test	Description	Procedure
DTCI Diagnostic	Performs a self-test on the DTCI PM	1. Enter the DTCI level of the MAP. 2. Enter **TST** to test the posted DTCI. 3. A card list is generated if the diagnostic fails. 4. If test fails, check the PM logs for additional information.
Internal Continuity Test	Verifies D-channel operation at the node level.	1. Enter the PRADCH level of the MAP. 2. Enter **POST GD** to identify the DCH. 3. Enter **CONT INT** to start testing.
External Continuity Test	Verifies D-channel continuity to the far end and back. The loopback at the far end must be set at the far end.	1. Enter the PRADCH level of the MAP. 2. Enter **POST GD** to identify the DCH. 3. Contact the far end to ensure loopback mode is set using the **LOOPBACK SET** command. 4. Enter **CONT EXT** to start testing. 5. Ensure that the far end removes loopback mode with the **LOOPBACK TAKEDOWN** command.

TRAVER enhancements

TRAVER is enhanced to include additional translation tables accessed by PRI call processing. These enhancements do not affect translations for non-PRI trunks.

The TRAVER command line format has been changed as follows:

traver <ORIG> |<NPI>| <DIGITS> |<OPT>| <TRACE>

The new fields NPI and OPT can be optionally added for PRI. These fields are used for calls originating on a PRI trunk. These fields do not affect any other type of trunk agency even if they are entered. The information contained in the OPT field is:

- NSF (optional)
- BC (optional)

This information, supplied in the PRI call setup message, enables the translation path for PRI.

Troubleshooting

Table 38 provides troubleshooting procedures for common problems.

Table 38
SL-100 PRI troubleshooting

Symptom	Procedure
If the DCH is locked out (LO)	Verify the datarate in table TRKSGRP matches that of the far end. Verify the IFCLASS in table TRKSGRP. If connected to another DMS-150, the endpoints of the local connection should have opposite values. Otherwise, the DMS-1=250 is always NETWORK. Verify that the appropriate NT6X50 is in the DS-1 and correctly datafilled in table CARRMTC. Verify the correlation of the transmission characteristics for the link: frame format, line encoding,etc. Use the Protocol Analyzer to verify frame synchronization.
When FF=ESF, yellow alarm indicated when no yellow alarm is being transmitted from the far end.	Put the carrier back into SF format. Make sure the far end is not transmitting yellow alarm and wait for the LCGA to clear. Return the carrier to ESF format.

DMS-100 and Meridian Digital Centrex

Basic call service is supported by the following Meridian DMS-100 network configurations:

- DMS-100 «» SL-1
- DMS 100 «» SL-100
- DMS-100 «» DMS-100 (future BCS)
- DMS-100 «» DMS-250 (future BCS)

ESN signaling is supported by the following Meridian SL-1 network configurations:

- DMS-100 «» SL-1
- DMS-100 «» SL-100

Basic call service and ESN signaling are also supported by Meridian Digital Centrex (MDC) applications on the DMS-100.

This section describes PRI links for basic call and ESN signaling. Because SS7 is a mature product, SS7 links are not discussed in detail.

This section documents BCS 30 for the DMS-100 and Release 15 for the SL-1.

Engineering planning DMS-100 network options

The DMS-100 supports PRI and SS7 links for ISDN networking and PRI links for Meridian Digital Centrex (MDC). An ISDN link includes the signaling link and associated trunks.Table 39 provides a summary of the DMS-100 network options for basic call.

- PRI links use a message-based, common channel signaling protocol, nB + D. Call control signaling (Q.931) is provided by the D-channel; the B-channels serve as voice/data trunks. The B and D-channels are carried on the PRI interface on one or more DS-1 spans.
- SS7 (or CCS7) links also use a message-based, common channel signaling protocol that separates the signaling link for call control from the voice/data trunks. SS7 trunks are ISDN User Part (ISUP) trunks. ISUP is the call control signaling protocol in SS7.

For PRI and SS7 signaling, the signaling link can reside on the same facility as the voice/data trunks or it can be a separate facility.

Table 39
DMS-100 network options for basic call and ESN

Trunk	PRI		SS7
Mode	PRI only	ITA (PRI + T1 A/B) *(note 1)*	SS7
Restrictions	Not used for intraLATA calls (DMS-100 to DMS-100)		Not available for SL-1 «» DMS-100 links.
BCS Software	BCS 29 minimum		BCS 26 minimum. ESN signaling requires BCS 27.
Capacity	Up to 20 DS-1 spans (1D + 479 B) D-channel: 1 min to 32 max B-channel: 1 min to 479 max.*(note 2)* One DS-1 link can carry multiple D-channels.		Refer to the appropriate SS7 NTP.
ESN Support	yes		yes

Note 1: With Integrated Trunk Access (ITA), both PRI trunks and PTS trunks (trunks with inband A/B signaling) are allowed on the same DS-1 span. However, special tone receivers (STRs) cannot be used on A/B trunks in ITA configurations.

Note 2: One D-channel supports up to 479 B-channels. However, for reliability a 1D:47B channel ratio (or 1 D-channel per 2 DS-1 links) is recommended.

PRI interface considerations

Basic call is configured as part of PRI or SS7 interface installation.Table 40 lists PRI interface requirements and networking considerations and provides a brief overview of PRI datafill for the DMS-100.

Refer to *PRI Interface* in the *Overview* section for a general description of PRI interface characteristics.

Table 40
DMS-100 PRI interface considerations

Link	PRI
Feature Packages (see *DMS-100 Software*)	ISDN PRI, PRI/CCS7 Interworking
Implementation	The PRI interface is provided by the DTCI PM. The DTCI is similar to the DTC PM, except that it supports both PRI and PTS trunk signaling and does not support the Special Tone Receiver (STR) card. All trunk types valid on DTCs are valid on DTCIs, except for SS7. An ISDN Signaling Preprocessor (ISP) card provides D-channel signaling for the PRI interface. The B and D-channels are associated with DS-1 spans in datafill.
Requirements	The DTCI requires the 6X69AB message switch card, the BX01AA ISP card, and a special load that includes the load for the ISP card. Four C-side ports should be datafilled in LTCINV to connect the DTCI to the network.
Networking Considerations	A DS-1 channel can be a B-channel, a D-channel, or a nailed up (provisioned) channel. By convention, the D-channel is assigned to channel 24. A DS-1 span can carry multiple D-channels. The D-channels only support B-channels on the same DTCI. Because the DTCI also supports PTS trunks, backup trunk groups can be configured on the same DTCI. However, for reliability, non-PRI trunk groups should be used for backup, preferably on a different PM. All data calls over a PRI B-channel are transported with bit transparency by removing the PADS associated with the PRI trunk.

PRI interface considerations (continued)

Table 40 (continued)
DMS-100 PRI interface considerations

Database Configuration for PRI (see *DMS-100 Database*)	A PRI trunk group is defined by: • Entering PRA or IBNT2 (MDC only) for the trunk type in table TRKGRP • Entering ISDN for the signaling type and defining the D-channel in table TRKSGRP • Defining each B-channel in table TRKMEM. • Assigning an LTID to the PRI interface as defined in tables LTDEF; LTMAP; and LTCALLS (used to route calls).

Basic call service considerations

Table 41 lists basic call service requirements and networking considerations and provides a brief overview of datafill for basic call service on the DMS-100.

- Refer to *Call Processing* in the *Overview* section for a general description of basic call processing on PRI links.

Table 41
DMS-100 basic call service considerations

Link	PRI
Feature Packages	Requires ISDN PRI feature packages only.
Implementation	Basic call is configured as part of PRI installation.
Requirements	None additional.
Networking Considerations	Route selection should be set up to select the PRI trunk first with overflow re-routing to the non-PRI trunks. Bearer capability allows trunk groups to be restricted to carry data only, voice only, voiceband data, or a combination of services. If the capability is disallowed, no calls that require that service may originate or terminate on the PRI interface. Bearer capability is compatible with all existing features, although it is not fully supported in hunt groups. BC is not supported on UCD or ACD lines. For conference calls only speech BC is supported. All private call originations on a PRI are considered to be intragroup. This can be overridden in IBN translations by datafilling the INTRAGRP flag to N in table IBNXLA.

Basic call service considerations (continued)

Table 41 (continued)
DMS-100 basic call service considerations

Database Configuration for Basic Call (see *DMS-100 Datafill*)	The call type (received in the setup message NSF IE) and LTID associated with the trunk indexes table LTCALLS for translations and routing. An NPI of private or public is supported. Normal routing applies. Authorized bearer services for the PRI trunk are datafilled in LTDEF as a characteristic of LTID, field OPTIONS. Tables BCDEF, BCCOMPAT, and KSETFEAT define the bearer capabilities, BC compatibilities and BCs for MDC terminals. If the DMS-100 tables show that the BCs are compatible, the call is completed. If the BCs are not compatible, the call is not completed and the originator is given a CNAC. No BC screening is done for non-PRI trunks. Access to a particular network can be accomplished in several ways: * Datafilling the DFLTNET option in table NCOS to allow stations within a customer group and NCOS to accessa particular network automatically • Datafilling the LOGNET option in table IBNXLA to allow stations in a customer group to use dialed codes to access different networks.
Feature Interactions	None

ESN signaling considerations

ESN signaling in ISDN networks is supported by both PRI and SS7 links. SS7 supports the same ESN features PRI supports.

Table 42 provides an overview of the DMS-100 requirements for implementing ESN signaling on PRI links.

Table 42
DMS-100 ESN signaling considerations

Link	PRI
BCS Software	BCS 25 minimum
Feature Packages	In addition to the ISDN PRI packages, the current ESN packages are required to support ESN on PRI.
Implementation	PRI supports all PBX/Centrex ESN features for ISDN networking or provides identical features in MCDN calling services.
Requirements	There are special datafill requirements for ESN signaling for the DMS-100 when connected to an SL-1. Tables PACMAN, COSMAP, and COSDATA must be datafilled to accommodate ESN digits incoming from the SL-1, and table DIGMAN must be datafilled for calls outgoing to the SL-1. These considerations apply only to BCS 30.
Networking Considerations	None additional.
Database Configuration for ESN (see *DMS-100 Datafill).*	A call type of PRIVATE is defined for the LTID in table LTCALLS and the translations attributes are obtained from the XLARTSEL specified in table LTCALLS. Table COSDATA maps TCOS to NCOS for compatibility between two PBX/MDC nodes (see *DMS-100 Datafill, NCOS to TCOS Mapping*).

Software requirements

Table 43 shows the software dependencies for basic call service for BCS 30 and above. Only those capabilities relating to PRI, basic call service, or ESN signaling on a PRI link are included.

Table 43
DMS-100 PRI basic call and ESN feature packages

Number	Description	Comments
NTX790AB	ISDN PRI	• PRI links to SL-1, SL-100, and DMS-250 • Includes ESN signaling support
NTX794AA	PRI/SS7 Interworking	Call completion between PRI and SS7 switches

Hardware requirements

Figure 8 shows the basic hardware architecture for PRI links. The necessary equipment includes:

- ISDN Digital Trunk Controller (DTCI); the DTCI uses the same two-shelf arrangement used by the DTC.
- Network Termination (NT1); the NT1 performs the terminating functions for the T1 transmission loop and is usually located on the subscriber premises.

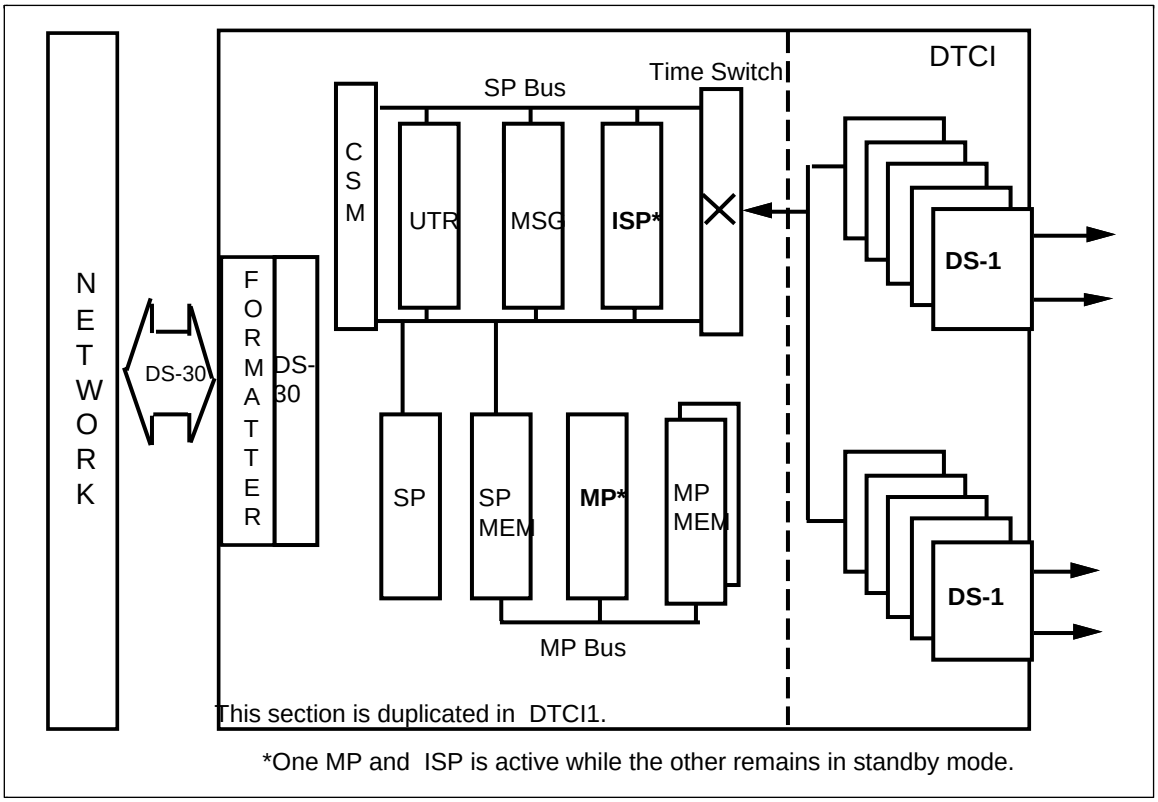
The DTCI can accommodate both PRI and A/B bit trunks within the same shelf. With Integrated Trunk Access (ITA), both A/B bit trunks and PRI trunks can be provisioned on the same DS-1 span.

Note 1: The DTCI does not support SS7 (CCS7 ISUP) trunks.

Note 2: The ISP16, UTR15, and MSG6X69 are also required.

Note 3: The DTCI does not support the STR card.

Figure 8
DMS-100 PRI hardware configuration



Hardware requirements (continued)

Table 44 shows the important hardware requirements for PRI links.

Table 44
DMS-100 PRI hardware description

Card	Abbreviation	NT_PEC	Comments
ISDN Common Peripheral Controller or ISDN Cabinet Trunk Module	CPEI (DMS-100) (*note 1)* MCTM-I (Cabinetized DMS-100)	6X01AB NX33AA	Up to 2 DTCI units: DTCI1 and DTCI2.
ISDN Digital Trunk Controller	DTCI	n/a	The DTCI consists of two shelves (0 and 1) supporting up to 20 DS-1 links (10 DS-1 cards) for 480 channels. DS-1 cards per shelf:1 min, 5 max . Each DS-1 card serves both DTCI units, under the control of the DTCI unit currently active.
DS-1 Interface Cards	DS-1	6X50AA or 6X50AB *(note 2)*	Slots 0-5 in DTCI; each card supports two DS-1 links (24 channels). Set switch settings according to distance to cross-connect.
ISDN Signaling Preprocessor	ISP	BX01AA	Slot 16 in DTCI. Supports up to 32 D-channels.
Master Processor	MP	6X45AC	Slot 8 in DTCI.

Note 1: The DTEI (used on other equipment types) is essentially the same as the CPEI.

Note 2: NT6X50AB card supports both ZCS (AMI) and B8ZS coding and SF or ESF framing formats. NT6X50AA supports ZCS and SF only. See *PRI datafill dependencies* in table 46.

Installation rules

The following rules and recommendations apply to PRI installations. This section assumes that the PRI hardware is properly installed and configured.

Node

1. Install a maximum of 20 DS-1 links for each DTCI.
2. Datafill the SL-100 according to the sequence in Table 71 and with the appropriate entries, as described in the SL-100 datafill section.
3. The following recommendations apply to configuring channels:
   - Each 6X50 card supports two DS-1 spans. Install one DS-1 card for every 2 D-channels (assuming 23B +D).
   - Distribute the D-channels over as many DS-1 cards as possible.
   - A minimum of one D-channel for two DS-1 links is recommended.
   - Leave unused B-channels undatafilled or provision them as PTS trunks.

   Note:If the DS-1 is being configured for Integrated Trunk Access (ITA), A/B trunks may be datafilled on non-PRI channels of the DTCI.

4. After datafill, load the DTCI and return it to service from the PM level of the map using the following commands:

   PM POST DTCI <DTCI#>

   BSY PM

   RTS PM.

5. Return the carrier to service using the following commands:

   MAPCI;TRK;CARRIER

   POST DTCI <DTCI#>

   BSY ALL

   RTS ALL.

Installation rules (continued)

6. Post the B-channels from the MAP and return the B-channels to service using the following MAP commands:
   - to enter the PRADCH level of the MAP

     MAPCI;MTC;TRKS;TTP;PRADCH
   - to post the B-channels

     POST G <trunk CLLI>
   - to MB the DCH if INB

     BSY ALL
   - RTS the posted DCH

     RTS ALL

   The D-channels will go to DMB state (D-channel mode busy).

7. Post the D-channels from the MAP and return the D-channels to service using the following MAP commands:
   - to enter the PRADCH level of the MAP

     MAPCI;MTC;TRKS;TTP;PRADCH
   - to post the D-channel

     POST GD <trunk CLLI> or **POST D** <circuit#>
   - to MB the DCH if INB

     BSY
   - RTS the posted DCH

     RTS

8, Run internal continuity tests on the D-channel. See *Maintenance, Tests.*

Network

9. When service is available end-to-end, run external continuity tests on the D-channels. See *Maintenance, Tests.*

DMS-100 datafill PRI datafill considerations

The following tables show the database parameters associated with configuring PRI and ESN capabilities. These tables describe datafill for dedicated trunking only. To configure ISA on the PRI link, refer to the *ISA Network Services Guide* (NTP 555-8001-102).

Only entries for the DTCI configuration are listed.

- The PRI interface datafill dependencies are listed in table x.
- Correlation tables show the parameters that must be coordinated with the far end for network service. See *DMS-100 datafill, correlation tables.*

Datafill presentation

In the following datafill tables, defaults are presented in **boldface**. Example tuples are presented at the end of a table. An example that is one continuous record may be shown on more than one line due to space limitations. Not all fields in a table may be shown. Only those fields important to PRI, basic call service, or ESN signaling are presented.

Important datafill considerations

The following datafill considerations apply:

- The CLLI name for the trunk group must be consistent throughout the datafill tables.
- Before deleting a code from the CLLI table, it must first be deleted from all tables that reference it (except for the CLLI maintenance table, which requires that the name first be deleted from table CLLI).
- To extend the CLLI or TRKGRP table, change the value of the field SIZE for the table in the System Data Table (SYSDATA) and do a cold restart. To increase the size of table TRKMEM, change field TRKGRSIZ in table CLLI -- no restart is required.
- With the table editor in interactive mode, to increase the value of the trunk group size, delete all trunk members in TRKMEM (the trunk group size is set to 0). Then reset to the higher value.
- When changing data for a trunk member, that member must be placed in the INB state.
- A TRKSGRP tuple cannot be changed or deleted unless the D-channel is in INB state.

PRI datafill sequence

Table 45 shows the datafill sequence for the PRI interface on the DMS-100. The PRI interface is configured first (steps 1-10), then the basic call service tables are filled (steps 11-15).

Steps 11 through 15 must be completed to define the type and level of services to be provided on the PRI interface, including bearer capabilities for the PRI trunks. The mapping of these logical attributes to the physical interface is done through table LTMAP.

The bearer services tables are datafilled last. These are described in a separate DMS-100 section, *Bearer services datafill considerations*.

In a DMS-100 office, a PRI trunk type contains a minimum of service and translations-related data, such as billing and trunk selection information. Fields that apply only to MDC are noted in the tables.

Table 45
DMS-100 PRI datafill sequence

		Initial install	*Add a trunk mem-ber*	*Add DS-1 span*	*Add a C-side link*
1. CLLI	Define the trunk group name and size.	X			
2. PADDATA	Define the transmit and receive pad values for the trunk group. (Optional; a default pad set is provided.)	OPT			
3. TRKGRP	Configure the trunk group.	X			
4. OFCENG	Define the number of allowable simultaneous PRI/SS7 calls.	X			
5. LTCINV	Identify the DCTIs to the system software (C-side port #).	X			X
6. CARRMTC	Configure DS-1 carrier and set error rates and alarms. (Optional; a default tuple for 64K clear is provided.)	OPT			

PRI datafill sequence (continued)

Table 45 (continued)
DMS-100 PRI datafill sequence

		Initial install	*Add a trunk mem-ber*	*Add DS-1 span*	*Add a C-side link*
7. LTCPSINV	Identify the DS-1 cards that are associated with a DTCI to the software (P-side port #) and datafill IID for PRI.	X		X	X
8. ADJNODE	Define the connection type and software versions of adjacent nodes.	X			
9. TRKSGRP	(sub of TRKGRP) Define the D-channel for the trunk group	X			
10. TRKMEM	Define the trunks (B-channels) for the trunk group.	X	X	X	X
11. LTDEF	Define the logical terminal (LT) and access privileges	X			
12. LTDATA	Specify additional service-related data for the LTID.	X			
13. LTCALLS	Refer to the initial translations associated with the call.	X			
14. LTMAP	Maps an LTID to the trunk group CLLI.	X			
15. NETNAMES	Defines the names and attributes of logical networks.	X			
16 CUSTNTWK	Define the customer networking features, including the display.	X (MDC only)			

CLLI table

Steps 1 through 10 must be completed to define PRI facilities for basic call processing.

Step 1: CLLI Define the trunk group name and size.

Note:The maximum number of CLLI codes is 8191.

Field	Entry	Description	Requirements	Comments
CLLI	alphanumeric (up to 12 characters)	trunk group name	Same as GRPKEY in TRKGRP. Use a period (.) or underline (_) to separate fields (leave no blanks).	It is recommended that you include PLACE, PROV, BLDG, TRAFUNIT, SUFX in this entry.
ADNUM	0 or 1 less than the CLLI table size	administrative trunk group number		
TRKGRSIZ	0-2047	the # of trunk group members	Use a number greater than the number of initial working trunks.	Because the trunk members must be on the same DTCI, the maximum number of PRI trunks is 480.
ADMININF	alphanumeric (up to 32 characters)	administrative information used by the operating company.	Use alphanumeric characters and underscores only. Use a period (.) or underline (_) to separate fields (leave no blanks).	It is recommended that you use TRAFCLS, OFFCLS, TRKGRTYP for this entry.
Example: **K2CPR64CL 100 24 PH_43_IT**				

PADDATA table

Step 2: PADDATA Define the transmit and receive pad values (optional).

Note: Use the default pad values provided or enter new values according to distance and hardware constraints.

Field	Entry	Description	Requirements	Comments
PADKEY		=subfields PADGRP1 and PADGRP2.	Must match field PADGRP in table TRKGRP.	Memory is automatically allocated for 64 pad groups. Up to 23 pad groups can be customer defined.
PADGRP1	alphanumeric (up to 4 characters)	pad group 1 name	Enter NPDGP if no PADS are desired.	PRAC is reserved for DMS-100 PRI.
PADGRP2	alphanumeric (up to 4 characters)	pad group 2 name	Enter NPDGP if no PADS are desired.	Use a reserved or a customer-defined pad group.
PAD1TO2	0 to 14L	the network transmit pad		If a reserved pad group is used, this value is automatically set.
PAD2TO1	0 to 14L	the network receive pad		If a reserved pad group is used, this value is automatically set.
Example: **PRAC UNBAL 2L 0**				

TRKGRP table

Step 3: TRKGRP Configure the trunk group.

Note: Maximum size = 2048 trunk groups; maximum # of LTIDs = 1022.

Field	Entry	Description	Requirements	Comments
GRPKEY		= subfield CLLI		
CLLI	alphanumeric (up to 12 characters)	CLLI name for the trunk group	Same as trunk group name in CLLI table.	
GRPTYP	PRA or IBNT2	trunk group type	Use PRA for PBX«» CO; use IBNT2 for MDC.	This entry determines what fields are required.
TRAFSNO	0-15 or 0-127	Traffic separation number for the trunk group . Allows peg counts by type of call.	If not required, enter 0. Reserve 1-9 for generic use. If NTX085AA is installed, enter 1 to value of parameter TFAN_OUT_MAX_NUMBER in table OFCENG. Same as TRAFSNO in tables ANNS, TONES, and LINEATTR.	0-127 with optional traffic separation software NTX085AA.
PADGRP	alphanumeric (up to 10 characters)	pad group name assigned to the trunk group	Enter NPDGRP if no PADS are desired. Must match PADKEY in table PADDATA.	

TRKGRP table (continued)

Step 3: TRKGRP Configure the trunk group (continued).

Field	Entry	Description	Requirements	Comments
NCCLS	NCRT, NCTC, NCLT, NOSC, NCBN, NCID, NCOT, NCIT, NCIC, NCON, NCOF	No Circuit Class type-used to select OM register for unavailable facilities and GNCT	Enter NCRT for no circuit.	
SELSEQ	ASEQ, DSEQ, or **MIDL**	Select sequence--selects the next idle trunk member in ascending (ASEQ), descending (DSEQ), or most idle (MIDL) sequence.	To SL-100, DMS-100, and DMS-250: Must have opposite values (ASEQ or DSEQ) at each end. To SL-1: Use ASEQ with LIN in the SL-1, or use MIDL with RRB in the SL-1.	Used to reduce B-channel glare. See *SL-100 datafill, Correlation tables*. Can be changed only if all trunk members are INB or UNEQ.
NCOS	0-255	Network class of service defines the access privileges of a user.		For MDC only. Index to NCOS table.
BILLDN	N or Y	Use CGN (N) or DN (Y) for billing for PRI interface.		For MDC only. If Y, a default DN is provided in table LTDATA if no DN is supplied on outgoing calls.

TRKGRP table (continued)

Step 3: TRKGRP Configure the trunk group (continued)

Field	Entry	Description	Requirements	Comments
LTID	$	= subfields LTGRP + LTNUM	Enter a $. An LTID is required for each trunk CLLI.	This is a read-only field. If the trunk group is not associated with an LTID in table LTMAP, this field displays $ and the PRI is inaccessible.
LTGRP		logical terminal group name	This field will be updated with the LTGRP entry in LTMAP.	Not prompted.
LTNUM		logical terminal group#	This field will be updated with the LTNUM entry in LTMAP.	Not prompted.

Example for PRI trunk**:**

K2KPRA64CLLP1 PRA 0 PRAC UNBAL NCRT ASEQ N (ISDN 555) $

Example for IBNT2 trunk:

K2CPR64CL
IBNT2 0
NPDGP NCRT COMKODAK 0 **ASEQ 60 N** ...
(ISDN 6) $

OFCENG table

Step 4: OFCENG Define the number of allowable simultaneous PRI/SS7 calls.

Field	Entry	Description	Requirements	Comments
PARMNAME	NO_OF_HIS _CONTROL_ BLKS	parameter name		
PARMVAL	1	parameter value	One HCB per trunk member is recommended.	
PARMNAME	NO_OF_HIS_ DATA_BLKS	parameter name		
PARMVAL	1	parameter value	One HDB per trunk member is recommended.	

LTCINV table

Step 5: LTCINV Identify the DCTIs to the system software (C-side port#).

Note: Memory is automatically allocated for a maximum of 128 tuples.

Field	Entry	Description	Requirements	Comments
LTCNAME		= subfields XPMTYPE and XPMNO.		Automatically adds entries to LTCPSINV.
XPMTYPE	DTCI	peripheral module type		
XPMNO	0-127	peripheral module#		
FRTYPE	CPEI	frame type for the XPM		Enter MCTM for cabinetized DMS-100.
FRNO	0-511	frame# for FRTYPE		
SHPOS	18, 32, 51, or 65	shelf position of the frame (inches)		
FLOOR	0-99	floor location of PM		
ROW	A-H, J-N, P-Z, AA-HH, JJ-NN, PP-ZZ.	row location of PM		
FRPOS	0-99	bay position in row of PM		

LTCINV table (continued)

Step 5 LTCINV (continued).

Field	Entry	Description	Requirements	Comments
EQPEC	6X01AB	the PEC of the XPM (CPEI)		
LOAD	alphanumeric (up to 8) characters	issue of the peripheral module software		The ISP load is included in the DTCI load.
EXECTAB	vector with 1-8 members	= subfields TRMTYPE + EXEC	PRAB DTCEX must be entered for PRI. At least one entry is required.	For ITA, the DMS-100 supports two execs for the DTCI: •ABTRK DTCEX •PRAB DTCEX
TRMTYP	PRAB or ABTRK	terminal type	Enter ABTRK for regular (PTS) trunks, or PRAB for PRI trunks	ABTRK is used for ITA.
EXEC	DTCEX	Specifies the set of executive programs for TRMTYP.	Maximum # is 8.	
CSLINKTAB	vector with 3-16 members	= subfields NMNO + NMPORT + CONTMARK.		
NMNO	0-31	the network module# assigned to XPM	Must correspond to C-side links 0-15 of the PM.	
NMPORT	0-63	network port# for NMNO		
OPTCARD	ISP16, MSG6X69, and UTR15	Defines XPM optional cards.	Enter ISP16, UTR15, and MSG6X69--all are required for the DTCI.	UTRs, if installed, are supported only in slot 15.

LTCINV table (continued)

Step 5 LTCINV (continued)

Field	Entry	Description	Requirements	Comments
TONESET	DEFAULT or NORTHAM	tone set	Enter DEFAULT if the switch is not equipped with a RAM6X69. Enter NORTHAM for North American tone set.	
PECS6X45	6x45AC	PEC for Master Processor	One PEC is required for each unit of the XPM. Enter PEC for unit 0 first.	
OPTATTR	$	optional attributes	Enter $.	Applies only to DTC CCS7 ISUP trunks.
PEC6X40	**6X40AA,** 6X40AB, or 6X40AC	PEC for DS-30 card.		
Example: **DTCI 0 DTEI 0 18 0 B 1 6X02AA DTI30BJ PRAB DTCEX** $ (**0 10) (UTR15) (MSG6X69) (ISP16) $ DEFAULT** **(6X45AC) (6X45AC) $ 6X40AC**				

CARRMTC table

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (optional).

Note 1: You may use the default tuple for 64K clear provided or enter new values in the CARRMTC table. If DEFAULT is entered for CARRIDX in table LTCPSINV, the table does not appear.

Note 2: Data contained in this table is referenced in table LTCPSINV, field CARRIDX. Data in this table must be consistent with the datafill in TRKSGRP. See *DMS-100 datafill, PRI datafill dependencies* in Table 46.

Field	Entry	Description	Requirements	Comments
CSPMTYPE	DTCI	C-side node PM type.		
TMPLTBM	**DEFAULT** or alphanumeric (up to 16 characters)	the template name for the PM	DEFAULT Is the initial entry allowed. DEFAULT templates cannot be deleted and can be changed only by Telco.	Referenced in table LTCPSINV to provide maintenance for DS-1 links. If DEFAULT is selected, fields RTSMAL, RTSOL, ATTR, and SELECTOR are omitted.
RTSML	0-**255**	warning limit for times returned to service during the audit interval		Enter 255 to disable this feature.
RTSOL	0-**255**	out-of-service limit for times returned to service during the audit interval		Enter 255 to disable this feature.
ATTR		= subfield SELECTOR		
SELECTOR	DS1	carrier type	Enter DS1 when CSPMTYPE = DTCI.	This entry determines what fields are required.

CARRMTC table (continued)

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms.(continued)

Field	Entry	Description	Requirements	Comments
CARD	NT6X50AA or **NT6X50AB** or NT6X50EC	PEC code for DS-1 card.	See *DMS-100 datafill, PRI datafill dependencies*, table 46.	NT6X50AA does not support 64K clear data links or ESF.
If CARD = NT6X50EC, the following field is required:				
ECHOI	ACCESS or NETWORK	Specify that echo cancellers are positioned on the ACCESS side or on the NETWORK side.		
The following fields are required for all CARD types:				
VOICELAW	MU_LAW or A_LAW	voice law used by the carrier	Enter MU_LAW.	This is the 1.544-Mbps, 24-channel PCM system used in North America. A_LAW is used mainly in international switches.
FF	SF or ESF	superframe (SF) or extended superframe (ESF) frame format	Must correspond with DS-1 card code. See *DMS-100 datafill*, *PRI datafill dependencies*, table 46	See note at end of table.

CARRMTC table (continued)

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (continued).

Field	Entry	Description	Requirements	Comments
ZLG	ZCS or B8ZS	zero logic line coding scheme for the DS-1	Use ZCS if repeaters or near end switch can't handle B8ZS. See *DMS-100 datafill*, *PRI datafill dependencies*, table 46.	ZCS results in 56-Kbps data rate; B8ZS results in 64 Kbps (64K clear).
BERB	BPV or CRC	bit error rate base	See *DMS-100 datafill*, *PRI datafill dependencies*, table 46.	
DLK	**NILDL**, FDL1, or FDL2	data link	Enter NILDL for nil data link. See *DMS-100 datafill*, *PRI datafill dependencies*, table 46.	FDL is used for transmitting yellow alarm. Currently, only NILDL is supported.
IAT	Y or **N**	inhibit alarm transit: transmit yellow alarm (N) or inhibit yellow alarm (y).		
LCGAST	1-**250**-9999	local carrier group alarm set threshold in units of 10 msecs		

CARRMTC table (continued)

Step 6: CARRMTC (continued).

Field	Entry	Description	Requirements	Comments
LCGACL	1-**1000**-9999	local carrier alarm clear threshold in units of 10 msecs	Use 2500 for DMS-100 «» MSL-1 (do not use the default).	
RCGAST	1-**50**-9999	remote carrier alarm set threshold in units of 10 msecs	For problems bringing carrier into service, use 1000 (10 secs).	
RCGACL	1-**50**-9999	remote carrier alarm clear threshold in units of 10 msecs	For problems bringing carrier into service, use 1000 (10 secs)	
AISST	1-**150**-9999	alarm indicator signal set threshold in units of 10 msecs		
AISCL	1-**1000**-9999	alarm indicator signal clear threshold in units of 10 msecs		
BEROL	**3**-6	BER out-of-service limit		3=>10K in 6 secs 4=>10K in 66 secs 5=>10K in 660 secs 6=>10K in 6600 secs

CARRMTC table (continued)

Step 6: CARRMTC (continued).

Field	Entry	Description	Requirements	Comments
BERML	4-**6**-7	BER maintenance limit		4=>10K in 66 secs 5=>10K in 660 secs 6=>10K in 6600 secs 7=>10K in 66000 secs
ES	0-**864-**9999	error second threshold in units of 10 msecs		
SES	0-**100**-9999	severe error second threshold in units of 10 msecs		
FRAMEML	0-**17**-9999	maintenance limit for frame loss		Table OFCENG also records this limit.
FRAMEOL	0-**511**-9999	out-of-service limit for frame loss	FRAMEOL should be larger than FRAMEML or only FRAMEOL will be used.	Table OFCENG also records this limit.
SLIPML	0-**4**-9999	maintenance limit for frame slip		Table OFCENG also records this limit.

CARRMTC table (continued)

Step 6: CARRMTC (continued).

SLIPOL	0-**255**-9999	out-of-service limit for frame slip.	SLIPOL should be larger than SLIPML or only SLIPOL will be used.	Table OFCENG also records this limit.

Example for 64K clear (the default tuple):

DTCI DEFAULT 255 255 DS1 NT6X50AB MU_LAW SF B8ZS BPV NILDL N 250 2500 50 50 150 1000 6 3 864 100 17 511 4 255 $

Example for 64K restricted and 56K:

DTCI DEFAULT 255 255 DS1 NT6X50AB MU_LAW SF ZCS BPV NILDL N 250 2500 50 50 150 1000 6 3 864 100 17 511 4 255 $

LTCPSINV table

Step 7: LTCPSINV dentify the DCTIs to the system software (P-side port #) and datafill IID for PRI.

Note: An entry in this table is automatically added when you add a DTCI to table LTCINV. Memory is automatically allocated for a maximum of 128 tuples.

Field	Entry	Description	Requirements	Comments
LTCNAME		= subfields XPMTYPE + XPMNO.		
XPMTYPE	DTCI	peripheral module type		
XPMNO	0-511	peripheral module#		
PSLNKTAB	vector with 0-19 members	= subfields PSLINK + PSDATA + CARRIDX + ACTION + IID.	Use DS1PRA for PRI or ITA. Use DS-1 for A/B bit signaling without ISDN.	DTCI supports DS1 and DS1PRA,
PSLINK	0-19	P-side port#		
PSDATA	DS1PRA	P-side interface	If carrier requires ISDN, enter DS1PRA. Enter NILTYPE if that carrier is not equipped on the DTCI.	DTCI supports DS1 and DS1PRA. For DS1, datafill CARRIDX and ACTION. For DS1PRA, datafill CARRIDX, ACTION, and IID.
CARRIDX	DEFAULT or valid template name datafilled in CARRMTC.	Index into table CARRMTC.	An entry for the PM type must already exist in table CARRMTC.	See *DMS-100 datafill*, *PRI datafill dependencies*, table 46.

LTCPSINV table (continued)

Step 7: LTCPSINV (continued).

Field	Entry	Description	Requirements	Comments
ACTION	Y or N	Remove carrier from service (Y) if FRAMEOL, SLIPOL, ES, or SES is exceeded.		
IID	0-31	The interface ID identifies the DS-1 spans associated with the D-channel.	For a single DS-1 span, use 0. For multiple DS-1 spans per trunk group, a different IID is required for each DS-1 in the trunk group.	Do not use 1 if connected to the SL-1.
Example: **DTCI 0** **(0 DS1PRA DEFAULT N 0) (1 DS1PRA DEFAULT N 0)** **(2 DS1PRA DEFAULT N 0) (3 DS1PRA DEFAULT N 0)** **(4 DS1PRA DEFAULT N 0) (5 DS1PRA DEFAULT N 0)** **(6 DS1 DEFAULT N) (7 DS1 DEFAULT N)** **(8 DS1 DEFAULT N) (9 DS1 DEFAULT N) $**				

ADJNODE table

Step 8: ADJNODE Define the connection type and software version of adjacent nodes

Note 1: The maximum number of tuples is 4096.

Note 2: The tuple in this table can be used by many different TKSGRP entries.

Field	Entry	Description	Requirements	Comments
ADJNODEK	alphanumeric (up to 12 characters)	adjacent node key--enter the names for each adjacent switch	It is recommended that you use type and version to identify the adjacent switch.	Referenced in table TRKSGRP, field ADJNODE.
SIGDATA	PRA	=PRODUCT + VERNUM subfields	Enter PRA for a PRI trunk.	
PRODUCT	For PRI: DMS, SL1, OTHER	adjacent switch type		
VERNUM	0 to 32767	software version in adjacent switch	Eliminate the decimal if used. This field must be updated if the software is updated in the adjacent node.	Use the BCS for DMS nodes; use the release number for SL-1s.
REMCTSUP	N or Y	Remote circuit testing is supported (Y) or is not supported (N).	This is an ISUP field and need not be datafilled for PRI.	.
Example: **PRASL115 PRA SL1 28**				

TRKSGRP table

Step 9: TRKSGRP Define the D-channel for the trunk group.

Note:Table size is automatically set at two times the number of trunk groups. Maximum size: 2048 trunk subgroups.

Field	Entry	Description	Requirements	Comments
SGRPKEY		= subfields CLLI + SGRP		To configure ITA on the DTCI, datafill the non-PRI trunk subgroups in table TRKSGRP along with the PRI trunk subgroups.
CLLI		CLLI trunk group name		
SGRP	0	subgroup#		Only one subgroup (subgroup 0) is allowed per PRI interface.
CARDCODE	DS1SIG	card code	DS1SIG is required for ISDN PRI.	
SGRVAR		= subfields SIGDATA through DCHBCKUP below.		
SIGDATA	ISDN	The call processing protocol	ISDN is the only valid field for a PRI trunk.	This entry determines what fields appear.
PSPDSEIZ	2-30	the time in seconds that the trunk must wait to receive the first digit		Applies only to inband DTMF digits.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
PARTDIAL	2-30	the time in seconds that the trunk must wait to receive each digit after the first digit		Applies only to inband DTMF digits.
VERSION	87Q931	the D-channel protocol version	This is the only value supported.	
CRLENGTH	2	Call reference length (# of octets)	The only value supported is 2.	
BCHNEG	Y or N	Allow B-channel negotiation (Y) or disallow (N).	The only value supported is N.	Not currently supported.
BCHGLARE	YIELD or STAND	The near end has priority in call collisions (STAND) or the far end has priority (YIELD).		When a call collision occurs, an entry of YIELD causes the call to be taken down and another trunk is selected.
IFCLASS	NETWORK or USER	The interface class defines the ends of the link for PRI message exchange.	The DMS-100 is always NETWORK.	USER always yields to NETWORK.
CONFIG	PT_PT	the broadcast procedure for the PRI interface	PT_PT is the only option supported by PRI.	Broadcast links (PT_MLT_PT) are used with BRA only.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
LOCATION	LOCALEO	the Q.931 Progress Indicator (PI IE) location		The far end should be datafilled according to equipment type: LOCALEO for DMS-100 or USER for SL-1 or SL-100.
SAT	Y or N	satellite switched--Yes (Y) or No (N)	N is the only value supported.	
ECSTAT	INTERNAL, EXTERNAL, INNOTONE, UNEQ	echo canceller status	Enter INTERNAL when the echo cancellers are quipped on the NT6X50EC card in the DTC frame and are enabled by call processing when the call is not a data call. This value is not allowed when echo suppressor is enabled. Enter EXTERNAL when echo cancellations are performed by external equipment and no call processing is involved. Use INNOTONE when internal echo cancellers are to be used but the 2100 Hz tone is turned off. This value is not allowed when echo suppressor is enabled. Enter UNEQ when no echo cancellers are equipped on this subgroup.	

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
TRKGRDTIM	1-**30**-255	trunk guard timer in units of 10 msecs--this is the time that the trunk waits after sending a DISCONNECT message and before putting the trunk into IDLE.	For PRI, a minimum value of 30 (300 msec) is recommended.	If the timer expire again after a second disconnect attempt, the B-channel is put into a LO state until a restart procedure is completed.
ADJNODE		index into table ADJNODE	Same as ADJNODEK in table ADJNODE.	
L1FLAGS	Y or N	Indicates whether or not the DTCI sends Layer 1 flags when the D-channel is in flagfill mode.	Enter N for DMS-to-DMS connections and Y for DMS-to-other vendor connections.	
DCHNL		The primary D-channel for this PRI interface; it includes subfields PMTYPE through HDLCTYPE below.		This field cannot be changed unless the D-channel is in INB state.

TRKSGRP tables (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
PMTYPE	DTCI	PM type	Use DTCI for BCS 30 and later.	
DTCINO	0-511	DTCI#		
DTCICKTNO	0-19	DS1 span on the DTCI for the D-channel		
DTCICKTTS	1-24	DS-1 timeslot (channel) for the D-channel.		
DCHRATE	64K or 56K	D-channel transmission rate	Use 64K if ZLG = B8ZS. Use 56K if ZLG = ZCS in table CARRMTC.	The D-channel rate should match the data rate datafilled for the DS-1 carrier.
HDLCTYPE	HDLC or INVHDLC	Indicate the bit format for messages as follows: HDLC for High Level Data Link or INVHDLC for inverted HDLC.		INVHDLC is a format in which all 0's are changed to 1's and vice versa. Some ISDN vendors use INVHDLC for PRI.
DCHBCKUP		The backup D-channel;.it includes subfields PMTYPE through HDLCTYPE above.	Not currently supported. Enter a $ for BCS30.	
Example: **K2CPR64CL 0 DS1SIG ISDN 10 20 87Q931 2 N STAND +** **NETWORK PT_PT USER N UNEQ 30 PRASL115 DTCI 10 0 24 64K HDLC $**				

TRKMEM table (continued)

Step 10: TRKMEM Define the B-channels for the trunk group.

Note:Table size is automatically determined according to field TRKGRPSIZ in table CLLI for each trunk group configured.

Field	Entry	Description	Requirements	Comments
CLLI		CLLI name for the trunk group	Must match trunk group name in CLLI table.	
EXTRKNM	0-9999	the external trunk#	The first digit in the tuple should be the same as the channel# for correct trunk selection.	
SGRP	0	trunk subgroup#	Same as SGRP in table TRKSGRP.	Always 0 for PRI trunks.
MEMVAR		= subfields PMTYPE + DTCNO + DTCCKTNO + and DTCCKTTS		
PMTYPE	DTCI	PM type		
DTCNO	0-511	DTCI# for the trunk group	Must match DTCINO in table TRKSGRP.	The B-channels must be on the same DTCI as the D-channel.
DTCCKTNO	0-19	DS-1 span on the DTCI for the B-channel	This carrier must be datafilled in LTCPSINV as DS1PRA.	
DTCCKTTS	1-24	DS-1 timeslot for this trunk member		

TRKMEM table (continued)

Step 10: TRKMEM (continued).

Field	Entry	Description	Requirements	Comments
Examples:				
K2KPRA64CLLP1 1 0 DTCI 10 0 1				
K2KPRA64CLLP1 2 0 DTCI 10 0 2				
K2KPRA64CLLP1 3 0 DTCI 10 0 3				
To configure ITA on the DTCI, datafill non-PRI trunk members along with PRI B-channels.				
Examples:				
K2KPRA64CLLP1 1 0 DTCI 10 0 1				
K2KPRA64CLLP1 2 0 DTCI 10 0 2				
K2KPRA64CLLP1 3 0 DTCI 10 0 3				
K2KABTRK1 1 0 DTCI 10 0 4 ABTRK GRP 1				
K2KABTRK1 1 0 DTCI 10 0 5 ABTRK GRP 2				

LTDEF table

Step 11: LTDEF Define the logical terminal (LT) and access privileges.

Field	Entry	Description	Requirements	Comments
LTKEY		LTID	Same as LTID in table LTDATA.	The LT group of the LTID must first be datafilled in LTGRP if anything other than ISDN is used.
LTAP	B	LT access privileges	Enter B for PRI (circuit-switched).	
CLASSREF		= subfield LTCLASS		
LTCLASS	PRA	the LT class		Defines the fields required and the services allowed.
NUMBCHNL	1-479	the # of B-channels in the trunk group		
NUMCALLS	1-479	the # of calls allowed on the LTID at one time.	This entry should be the same as the NUMBCHNL entry. The sum of the incoming calls and outgoing calls must be less than or equal to the number of calls allowed.	
INCALLS	0-479	the # of reserved incoming only calls allowed on the LTID at one time		Not used; enter any number.

LTDEF table (continued)

Step 11: LTDEF (continued).

Field	Entry	Description	Requirements	Comments
OUTCALLS	0-479	the # of reserved outgoing only calls allowed on the LTID at one time		Not used; enter any number.
OPTIONS	vector with up to 4 members: NOVOICE, NOVBD, NOCMB, **NOPMD**	Defines the bearer capabilities for the LTID. It defines the types of calls not allowed: NOVOICE for no voice calls, NOVBD for no voiceband data calls, NOCMB for no circuit-mode data calls, and NOPMD for no packet-mode data calls.		Applies to terminating and originating calls.
Example:				
ISDN 555 B PRA 5 5 1 1 NOPMD $				

LTDATA table

Step 12: LTDATA Specify additional service-related data for the LTID.

Field	Entry	Description	Requirements	Comments
LTID		= subfields LTGRP +LTNUM	Same as LTKEY in table LTDEF.	
LTGRP	ISDN	the LT group type		Non-ISDN groups can be datafilled if table LTGRP is datafilled first.
LTNO	1-1022	LT# within the group		
DATATYPE	NIL, DN, or SERV	data type for the services associated with this LTID		For service-related data associated with an LTID.

LTDATA table (continued)

Step 11: LTDATA (continued).

Field	Entry	Description	Requirements	Comments
When DATATYPE = DN, the following fields are required.				
DFLTCGN	10 digits: NPA + NNX + XXXX	the 10-digit DN (default) if no CGN is supplied on outgoing calls. With CGN screening, this DN is the only DN that can originate calls.	Appropriate digits must be datafilled in table THOUGRP.	Only one 10-digit number is supported. Also used for billing if the BILLDN field in table TRKGRP is Y.
OPTIONS	CUSTGRP	Select CUSTGRP option.	Enter $ if no options are required.	Only one entry allowed. Optional when DATATYPE=DN.
CUSTGRP	alphanumeric	Enter the customer group name.		
When DATATYPE = SERV, the following fields are required:				
AUDTRMT	N or Y	Audible treatments. Specify whether inband tones and announcements should be provided instead of "disconnect with cause" for treatments from this LTID.		
CGNREQD	N or Y	Specify whether CGN must be provided by the calling user switch.		

LTDATA table (continued)

Step 11: LTDATA (continued).

Field	Entry	Description	Requirements	Comments
CGNDELV	NEVER, SCREENED, ALWAYS	Specify when the CGN must be provided.	Use SCREENED when the CGN should not be sent (it is screened for privacy).	
CDNDELV	NEVER or ALWAYS	Specify whether the CDN must be delivered to the called interface.		
OPTIONS	TBO or CHG	Specify the terminating billing option for the trunk group CLLI or the charge number in calling number digits when no calling number is available.		Up to two entries allowed.
CALLCODE	800-999	Enter a generic call code in this range.		Required when OPTION = TBO.
SFPRNT	N or Y	Specify whether the service feature is present or not.		Required when OPTION = TBO.
SFEATVAL	800-999	Enter a service feature value.		Required when SFPPRNT=Y.
Example: **ISDN 555 DN 6137221234 $**				

LTCALLS table

Step 13: LTCALLS Provides the initial translations associated with the call type.

Field	Entry	Description	Requirements	Comments
LTID		the LTID from table LTDATA		
CALLTYPE	PUB, PVT, WATS, INWATS, FX, or TIE	Defines the call type allowed on this PRI interface.		If XLARTSEL = XLALEC, the following call types are not valid: PVT, INWATS, and TIE.
XLARTSEL		= subfield XLARTE		
XLARTE	XLAIBN, XLALEC, or RTE REF	the translation route selector: XLALEC for POTS, PBX, or Centrex; XLAIBN for PBX or MDC only; or RTEREF, which refers to a specific table and index, such as OFRT or IBNRTE.		Only one selector is allowed. This entry determines what other fields are required. If CALLTYPE = PRIVATE, XLALEC is not allowed.
When XLALEC is entered, the following fields are required:				
LINEATTR	0-1023	index to table LINEATTR		Used to index table LINEATTR for public calls.
When XLAIBN is entered, the following fields are required: • If CALLTYPE = PUB, then the LINEATTR index is used to index table LINEATTR. • If CALLTYPE = PVT, then CUSTGFP, SUBGRP, and NCOS are used to index IBNXLA.				
LINEATTR	0-1023	index to table LINEATTR		Used to index table LINEATTR for public calls.

LTCALLS table (continued)

Step 13: LTCALLS (continued).

Field	Entry	Description	Requirements	Comments
CUSTGRP	alphanumeric	customer name associated with an IBN station		
SUBGRP	0-7	The subgroup number for the CUSTGRP		
NCOS	0-255	The network class of service, which defines calling privileges for the user.		
When RTEFEF is selected, the following fields are required (CALLTYPE is irrelevant):				
RTEID	OFRT or IBNRTE and a number from 1 to 1023	the routing table and index into that table		
OPTIONS	$		Enter $.	Not used in this BCS.
Example: **ISDN 555 PUB XLALEC..... 52 $**				

LTMAP table

Step 14: LTMAP Map the LTID to the CLLIs of PRI trunk groups.

Field	Entry	Description	Requirements	Comments
LTID		LTKEY from table LTDEF indexes this table.		Automatically updates LTID field in table TRKGRP.
MAPPING	CLLI			Always set to CLLI for PRI.
CLLI		CLLI name for the trunk group	Must match CLLI name in table TRKGRP.	
OPTIONS	TEI 0		Enter TEI 0 for every LTID entry.	TEI is the only supported option for PRI.
Example: **ISDN 555 CLLI K2KPR64CL TEI 0 $**				

NETNAMES table

Step 15: NETNAMES Define the names and attributes of logical networks.

Field	Entry	Description	Requirements	Comments
NETNAME	alphanumeric (up to 32 characters)	logical name for the private network.	Must match NETNAME in table CUSTNTWK.	PUBLIC NETNAME is already datafilled. Additional network names may only be provided if software package NTXA40AA is resident on the switch.
EXTNETID	1-32767	external network identifier		0 is assigned to PUBLIC NETNAME.
NETDIGS	0-10	number of digits used in the logical network.		Used for digit collection.
Example:				
PUBLIC	**0**	**10**	**$**	
PRIVPBX	**7**	**7**	FACREJ $	

CUSTNTWK table

Step 16: CUSTNTWK Define the customer networking features, including the display.

Note:Table CUSTNTWK is a table within table CUSTENG. (This table applies to MDC only.) Table CUSTENG and table NETNAMES must be datafilled before table CUSTNTWK.

Field	Entry	Description	Requirements	Comments
CUSTNAME	alphanumeric (up to 16 characters)	customer group name	Must match CUSTNAME in CUSTENG.	Initialized for the "PUBLIC" network. Additional network names may only be provided if software package NTXA40AA is resident on the switch.
NETNAME	alphanumeric (up to 32 characters)	the network assigned to customer group in table NETNAMES	Must match NETNAME in NETNAMES table.	
NETCGID	1-4096	network customer group ID#	Must be unique. Must be the same throughout the network. Customer names need NOT be the same.	Cannot previously have been defined for the same NETNAME within the table.
OPTIONS	CLID or NTWKRAG	MCDN feature options		
CLIDOPT	ONNET or OFFNET	Calling line ID options.	Enter OFFNET to enable the NETCGID on all networks.	

CUSTNTWK table (continued)

Step 16: CUSTNTWK Define the customer networking features, including the display.

Note: Table CUSTNTWK is a table within table CUSTENG. (This table applies to MDC only.) Table CUSTENG and table NETNAMES must be datafilled before table CUSTNTWK

Field	Entry	Description	Requirements	Comments
Example:				
BNRCAR	**BNRESN 1 +**			
PUBLIC	**BNRPOTS 10 +**			
BNRESN	**BNRPRIV 7 +**			
NTWKRAG	CLID OFFNET	**$**		

Routing tables

The DMS-100 uses the following routing tables for basic call service or ESN over PRI: IBNRTE, RTEREF, and OFRT.

- OFRT provides the routing for IBN and POTS calls
- IBNRTE (MDC only) provides the routing for IBN calls.
- HNPACONT.RTEREF provides the routing for local calls.
- FNPACONT.RTEREF provides the routing for toll calls.

There are no changes to these tables for conventional.dedicated service trunk routing.

- For ISA routing, refer to NTP 555-8001-101.

IMPORTANT: These tables must be datafilled before datafilling LTCALLS.

Configuring backup trunk groups

Because the DTCI also supports non-PRI trunks, backup trunk groups can be configured on the same DTCI. The backup trunk group can be configured as a single two-way trunk group or as two one-way trunk groups.

The following example tuple for table OFRT shows how this can be implemented.

Table OFRT tuple:

99	**S**	**N**	**N**	**N**	**DMS2MSLPRA**
	S	**N**	**N**	**N**	**DMS2MSLDAL**

In this example, when a user dials the code for the PRI trunk, the call is routed using route OFRT 99. Calls are first offered via the PRI group DMS2MSLPRA. If this trunk group is 100% busy, out of service, or experiences protocol failure during the call setup, the call is re-offered on the DAL trunk DMS2MSLDAL. Calls incoming on DMS2MSLDAL should be handled the same as calls incoming on DMS2MSLPRA.

PRI datafill dependencies

Table 46 lists the datafill dependencies in the DS-1 span. The datafill entered for table CARRMTC must be consistent with the datafill in table TRKSGRP.

Table 46
DMS-100 PRI datafill dependencies

CARRMTC table					***TRKSGRP table***	
CARD	**FF**	**ZLG**	**BERB** *(note 1)*	**DLK** *(note 2)*	**DCHRATE**	**HDLCTYPE**
NT6X50AA	SF	ZCS	BPV	NILDL	56K or 64K	HDLC or INVHDLC
NT6X50AB	SF	ZCS	BPV	NILDL	56K or 64K	HDLC or INVHDLC
		B8ZS	BPV	NILDL	64K	HDLC or INVHDLC
	ESF	ZCS	CRC	NILDL	56K or 64K	HDLC or INVHDLC
		B8ZS	CRC	NILDL	64K	HDLC or INVHDLC

Note 1: When CRC is entered, both BPV and CRC are used.

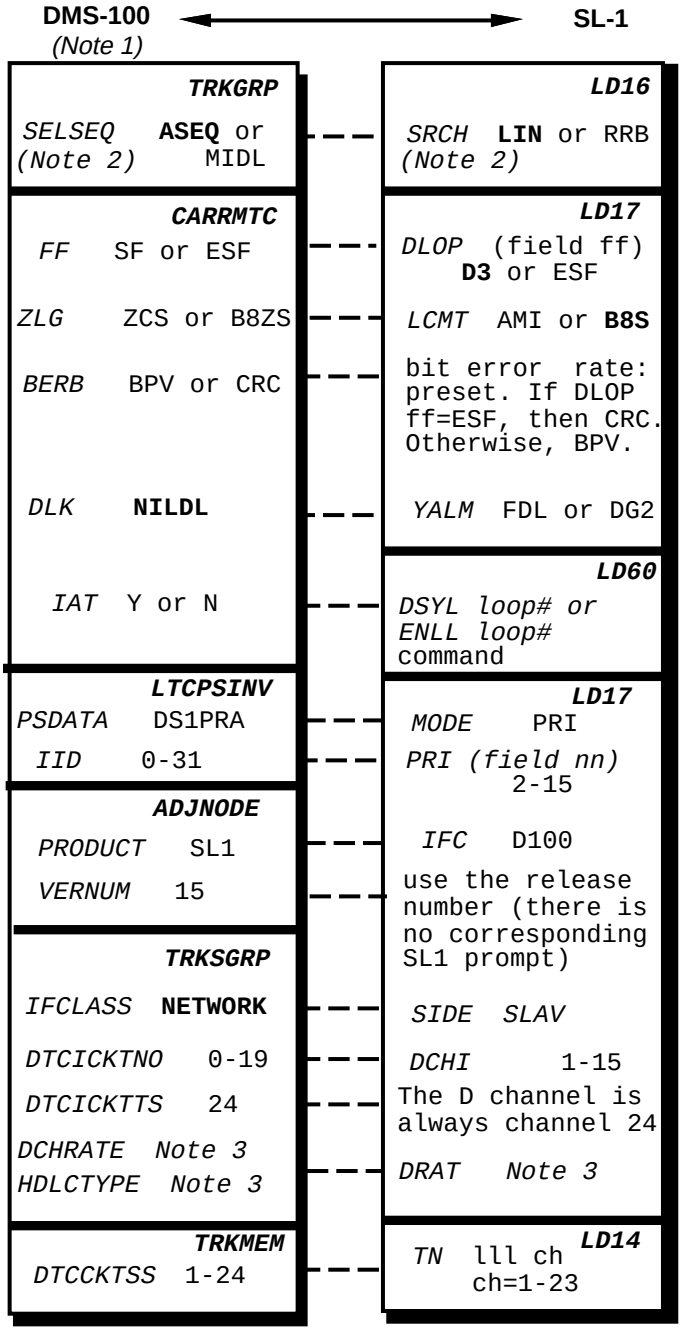
Note 2: DLK is used for transmitting yellow alarm. Use NILDL for nil data link; use FLD1 for input from timeslot 2 or FLD2 for input from external interrupt. Currently, only NILDL is supported.

Correlation tables

The correlation tables that follow show the parameters that must be coordinated between the near and far end for network service.

Note: Because ISDN is an evolving architecture, there may be some differences in datafill between different product types.

DMS-100 to SL-1 correlation table



Note 1:

Refer to *DMS-100 datafill , PRI datafill dependencies* for required consistencies in the PRI interface.

Note 2:

The following combinations are valid:

DMS-100	SL-1
ASEQ	LIN
MIDL	RRB

Note 3:

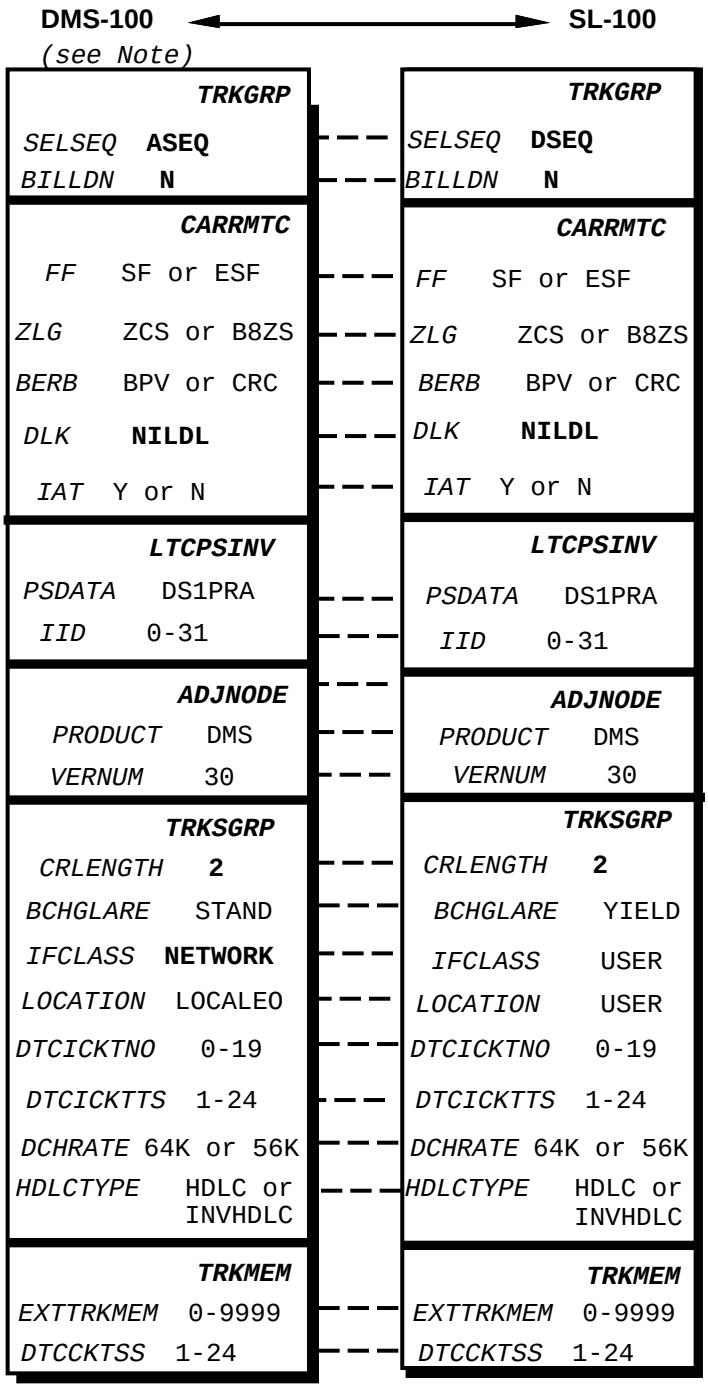
The following combinations are valid:

DMS-100		SL-1
DCHRATE	*HDCLTYPE*	*DRAT*
56K	HDLC	56K
64K	HDLC	64KC
64K	INVHDLC	64KI

Key

Prompts appear in *italics.*
Default appears in **boldface.**

DMS-100 to SL-100 correlation table



Note:
Refer to *DSM-100 datafill , PRI datafill dependencies* for required consistencies in the PRI interface.

Key
Prompts appear in *italics.*
Default appears in **boldface.**

Bearer service tables (MDC only)

Bearer capability (BC) screening ensures that calls are connected only between compatible terminals. Tables BCDEF, BCCOMPAT, KSETFEAT, and LTDEF are datafilled to provide the necessary BC parameters:

- Table BCDEF defines the different BCs available.
- Table BCCOMPAT defines what BCs are compatible with one another.
- Table KSETFEAT associates the call (by terminal type) with the bearer capability desired.
- Table LTDEF (for the LTID OPTIONS) defines which BCs are allowed to terminate on a specific PRI trunk group.

These tables must be datafilled for basic call service to work correctly.

Datafill presentation

In the following datafill tables, defaults are presented in **boldface**. Example tuples are presented at the end of a table. An example that is one continuous record may be shown on more than one line due to space limitations. Not all fields in a table may be shown. Only those fields important to bearer services are presented.

Important datafill considerations

The datafill for the bearer service tables can be altered if required, with the following exceptions:

- BCs mapped to themselves in table BCCOMPAT cannot be deleted.
- To change a BC of a device in table KSETFEAT, the BC name as defined in table BCDEF must be entered in the OPTIONS field. If the BC OPTIONS is not used, a default BC will be used.

Note: All non-ISDN sets (500/2500 sets, EBSs, and ACs) are assumed to have SPEECH BC.

Bearer services datafill considerations

Default BC summary

The default values associated with tables BCDEF, BCCOMPAT, and KSETFEAT are summarized in Table 47. The OPTIONS field in table LTDEF is described in *LTDEF table* in the *DMS-100 PRI datafill* section.

Table 47
Default BC summary

Device	Encoded BC	Compatible Incoming BC
500/2500	SPEECH	SPEECH/3_1KHZ
P-phone	SPEECH	SPEECH/3_1KHZ
Attendant	SPEECH	SPEECH/3_1KHZ
ADM/SADM/DTI	56KDATA	56KDATA
HSDU	56K/64KDATA	56K/64KDATA (Note 1)
LSDU	19.2KDATA	19.2KDATA
DTI/TRK	SPEECH	SPEECH/3_1KHZ
MODEM PHONE	3_1KHZ	3_1KHZ (Note 2)
ISDN BRAKS	SPEECH	SPEECH/3_1KHZ
ISDN BRAKS	56K/64KDATA	56K/64KDATA (Note 3)

Note 1: Although the BC for dataunits is sent out as 56K in the call processing messages, this BC can accommodate 56K or 64K data rates. If 64K is to be used, datafill table KSETLINE for 64KDATA.

Note 2: An ISDNKSET is BC datafilled as 3_1KHz.

Note 3: 56KDATA or 64KDATA must be datafilled in table KSETFEAT for an ISDN BRAKS.

Bearer services datafill sequence

Table 48 shows the datafill sequence for the bearer service tables.

- Table LTDEF, field OPTIONS, is datafilled as part of the Service Tables datafill sequence.
- Table BCDEF must be datafilled before table BCCCOMPAT

Table 48
DMS-100 BC datafill sequence

		Initial install	Add a trunk mem-ber	Add DS-1 span	Add a C-side link
1. BCDEF	Define the available BCs.	X			
2. BCCOMPAT	Define which BCs are compatible with one another.	X			
3. KSETFEAT	Assign a bearer capability to the terminal type.	X			

BCDEF table

Table BCDEF contains five default bearer capabilities that are available for PRI, datafilled as follows in Table 49. One of these values should be used to define the BC for the line or logical terminal If a BC other than these five is received, the call is rejected.

Table 49
Default BCDEF summary

Field	Default Bearer Capabilities for PRI (see note)					
BCNAME	SPEECH	64KDATA	64KREST	56KDATA	3_1KHZ	DTU
XFERCAP	SPEECH	UNRESDIG	RESDIG	UNRESDIG	3_1KHZ	RESDIG
XFERMODE	CIRCUIT	CIRCUIT	CIRCUIT	CIRCUIT	CIRCUIT	CIRCUIT
CODINGST	CCITT	CCITT	CCITT	NETWORK	CCITT	NETWORK
PROTOTYP				DTU		DTU
PROTOCOL				NONE		TLINK
SYNC				Y		Y
DATARATE				56 Kbps		AUTO
DISCRIM						

Note: Blank fields indicate that that parameter does not apply; those fields that do not apply are not prompted for.

If it is necessary to change this table, the fields may be datafilled as in the table below.

Note:This table must be defined before table BCCOMPAT is defined.

Field	Entry	Description	Requirements	Comments
BCNAME	alphanumeric (up to 16 characters)	bearer capability name		A maximum of 59 BCs may be defined.
BCDATA		= subfields XFERCAP + XFERMODE + CODINGST		

BCDEF table (continued)

Field	Entry	Description	Requirements	Comments
XFERCAP	SPEECH, UNRESDIG, RESDIG	the type of data being trans-mitted: SPEECH is for voice calls; UNRESDIG is for packet mode calls; RESDIG is for 56 Kbps data calls.		
XFERMODE	CIRCUIT, PACKET	transmission mode		
CODINGST	CCITT, NETWORK	the coding standard for BC: CCITT or a network-specific coding standard.		This selector determines what other fields are required.
When CODINGST = NETWORK, the following fields are required:				
PROTOTYP	MODEM, DTU, OTHER	The physical device at the endpoint determines the protocol used.		
When PROTOTYP = MODEM, the following fields are required:				
MODEMPRO	alphanumeric	Identify the modem protocol.	The name used must be defined in table MODEMPRO.	
MODEMSNC	Y or N	synchronous (Y) or async (N) communications		

BCDEF table (continued)

Field	Entry	Description	Requirements	Comments
MODEMRTE	75BS, 150BS, 300BS, 600BS, 1200BS, 2400BS, 3600BS, 4800BS, 7200BS, 8KBS, 9600BS, 14400BS, 16KBS, 19200BS, 32KBS, 48KBS, 56KBS, AUTO	modem data rate		
When PROTOYPE = DTU, the following fields are required:				
DTUPRO	alphanumeric	protocol name	Must be defined in table DTUPRO.	
DTUSYNC	Y or N	synchronous (Y) or async (N) communications		

BCDEF table (continued)

Field	Entry	Description	Requirements	Comments
DTURATE	75BS, 150BS, 300BS, 600BS, 1200BS, 2400BS, 3600BS, 4800BS, 7200BS, 8KBS, 9600BS, 14400BS, 16KBS, 19200BS, 32KBS, 48KBS, 56KBS, AUTO	modem data rate		
When PROTOYPE =OTHER, the following fields are required:				
DISCRIM	0-63	Identifies OTHER devices		
Example: **SPEECH SPEECH CIRCUIT CCITT** **64KDATA UNRESDIG CIRCUIT CCITT** **3_1KHZ SPEECH CIRCUIT CCITT** **DATAUNIT RESDIG CIRCUIT NETWORK DTU TLINK Y AUTO**				

BCCOMPAT table

Table BCCOMPAT controls the mapping of BC compatibilities. This table shows the mapping of default BCs provided in table BCDEF. Other BC pairs can be mapped, provided they are first defined in table BCDEF.

Note: These tuples are entered at load build time. A maximum of 3906 BC pairs may be mapped.

Field	Entry	Description	Requirements	Comments
KEY		= subfields CALLBC and TERMBC		Used to define compatible combinations. By default, any bearer capability is compatible with itself-no tuples need be entered. For bidirectional compatibility, two tuples must be defined.
CALLBC	NILBC, SPEECH, 64KDATA, 64KX25, 56KDATA, DATAUNIT, 3_1KHZ, 64KRES	BC name	Must be defined in BCDEF.	
TERMBC	NILBC, SPEECH, 64KDATA, 64KX25, 56KDATA, DATAUNIT, 3_1KHZ, 64KRES	BC name	Must be defined in BCDEF.	
Example: **64KRES DATAUNIT** **DATAUNIT 64KRES**				

KSETFEAT table

The BC feature is assigned in table KSETFEAT. This table lists the line features assigned to the business sets, data units, and ISDN terminals listed in the KSETLINE table.

- All non-ISDN sets (500/2500 sets, EBSs, and ACs) are assumed to have SPEECH BC.
- SPEECH is used if a data terminal is attached to a terminal adapter.
- ISDN terminals do not require a BC because they have the ability to screen incoming calls on the basis of information sent to them by the network. They use the BC assigned to the trunk LTID in table LTDEF.

To change the BC assigned to a terminal in KSETFEAT, the BC feature must be selected and the BC name (as defined in table BCDEF) is entered . If the BC is not defined, a default BC is used.

Field	Entry	Description	Requirements	Comments
FEATKEY	= subfields LTGRP + LTNUM + KEY + FEAT			
LTGRP	ISDN	logical terminal group		
LTNUM	1-1022	logical terminal number		
KEY	1-69	Enter the number associated with the DN appearance to which the feature is being assigned.		For M2317 telephones, only keys 1-11 can be used.
FEAT	BC	selects BC option		
FEATURE	BC	enter BC feature		
KVAR		= subfield BCNAME		

KSETFEAT table (continued)

Field	Entry	Description	Requirements	Comments
BCNAME	SPEECH, 64KDATA, 56KDATA, DATAUNIT, 3_1KHZ, or 64KRES	the bearer capability associated with this line or LTID.		The 64KX25 BC does not apply to basic call.
Example:				
ISDN 555 8 BC BC 64KDATA				

ETN TCOS to NCOS mapping (MDC only)

Table 50 shows the datafill to be used for TCOS compatibility between two SL-100s. These parameters are datafilled in table COSDATA.

- Mapping TCOS to NCOS is one-to-one; for example the 0-255 NCOSs are mapped one-to-one to 0-7 TCOSs.
- Mapping NCOS to TCOS involves an algorithm that transforms the TCOS value to a number between 0 and 7 for all NCOSs over 7.

Table 50
TCOS to NCOS mapping

COSNAME	NCOS	TCOS
ETN	0	0
ETN	1	1
ETN	2	2
ETN	3	3
ETN	4	4
ETN	5	5
ETN	6	6
ETN	7	7
ETN	8	0
ETN	9	1
...and so on.		

Operational measurements DS1CARR OMs

The DS1CARR OMs monitor the performance of DS-1 lines for each carrier. This OM group has replaced the CARR OM group. Provisioning for the registers in the DS1CARR group is per DS-1 carrier.

> ***Note:*** These OMs correspond to Layer 1 (physical layer) in the Open Systems Interconnection (OSI) model.

The following OM pegs are accumulated for each DS-1 carrier for 24 hours and are reset when DS1LOF and DS1SLP are reset.

- DS1OMINFO Key to digital carrier equipment table
- DS1LCGA DS-1 local carrier group alarm
- DS1RCGA DS-1 remote carrier group alarm
- DS1BER DS-1 bit error rate maintenance or out-of-service limits exceeded
- DS1LOF DS-1 framing lost on the incoming side
- DS1SLP DS-1 frame slip
- DS1SBU DS-1 carrier busied out by system-originated commands
- DS1MBU DS1 carrier busied out by commands from the MAP
- DS1CBU DS-1 carrier in CSBY state (DTCI out of service)
- DS1PBU DS-1 carriers in PSBY state
- DS1BER DS-1 bit error ratio (replaces DS1BPV)
- DS1ES DS-1 error second
- DS1SES DS-1 severe error second
- DS1UAS DS-1 unavailable second

DCH OMs

The PRADCHL2 group contains the OMs for the D-channel signaling link . This OM group is pegged in the DTCI and collected from the PM just before the OM transfer from the active to the holding registers.

> ***Note:*** These OMs correspond to Layer 2 (link layer) in the Open Systems Interconnection (OSI) model.

PRADCHL2 registers are as follows:

- PRDDISCT Count of discarded transmit frames accumulated during one minute.
- PRDS0RX Count of successfully received SAPI 0 (circuit-switched data) frames accumulated over one minute.
- PRDRNRRX Count of RNR (Receiver Not Ready) frames received from peer accumulated over one minute.
- PRDCRC Count of frames received with CRC (Cyclic Redundancy Check) errors, accumulated over one minute.
- PRDSBMTX Count of link resets caused by ISP accumulated over one minute.
- PRDREJTX Count of REJ (Reject) frames transmitted by ISP.
- PRDDISCR Count of received frames discarded due to other errors, accumulated over one minute.
- PRDSBMRX Count of link resets caused by peer accumulated over one minute.
- PRDS0TX Count of successfully transmitted SAPI 0 (circuit-switched data) frames accumulated over one minute.
- PRDRNRTX Count of RNR (Receiver Not Ready) frames transmitted by ISD to peer accumulated over one minute.

TRK OMs

TRK OMs monitor call processing performance of the trunk group. Provisioning for the registers in the TRK group is per trunk group.

> ***Note:*** These OMs correspond to Layer 3 (network layer) in the Open Systems Interconnection (OSI) model.

The following OM pegs are accumulated over 24 hours and are reset when DS1LOF and DS1SLP are reset.

- OM2TRKINFO Trunk information fields: direction, total circuits,and working circuits
- INCATOT Incoming seizures
- PRERTEAB Abandoned incoming call attempts
- INFAIL Call origination attempts terminated unsuccessfully
- NATTMPT Calls routed to this trunk group
- NOVFLATB Call processing overflows
- GLARE Dropped calls due to glare
- OUTFAIL Unsuccessful outgoing seizures
- DEFLDCA Routed calls prevented from using this trunk group by network management
- DREU Directional reservation activated
- PREU Protective reservation activated
- TRU Trunks found in tk_cp_busy, tk_cp_busy_deload, and tk_lockout
- SBU Trunks found in tk_remote_busy, tk_pm_busy, tk_system busy, tk_carrier_fail, and tk_deloaded.
- MBU Trunks found to be in tk_man_busy, tk_seized, tk_nwm_busy.
- OUTMTCHF Incoming failures due to network blockage.
- CONNECT Outgoing seizures resulting in successful calls.
- TANDEM Incoming calls initially routed to an outgoing trunk group.
- AOF Incoming ANI failures (does not apply to PRI trunks).
- TOTU Sum of TRU, SBU, and MBU counts.

Treatment OMs

Treatment OMs monitor call processing performance of the trunk group. Treatments are routed to the originating PRI with the cause value in a DISC message.

Peg counts are accumulated according to five groups: Customer Unauthorized (CU), Customer Misc (CM), Equipment Related (ER), Feature Related (FR), Resource Shortage (RS). The treatments are mapped to these groups as follows (important items are in boldface):

- Customer Unauthorized: ADBF, ANBB, ANIA, CACE, CCNA, CCNV, CNDT, CNOT, D950, DACD, DCFC, **DNTR**, DODT, FDNZ, **FNAL**, HNPI, ILRS, INAC, INAU, INCC, IVCC, LCAB, MSCA, MSLC, N950, NACD, **NACK**, NOCN, ORSSRSDT, TDND, TESS, TINV, UMOB, UNCA, UNIN, UNOW, UNPR.
- Customer Misc: ANCT, ANTO, ATBS, ATDT, BLDN, BLPR, CFWV, DISC, OPRT, **PDIL**, **PSIG**, TDBR, TRBL, UNDN, UNDT, VACS, **VACT**, VCCT.
- Equipment Related: AIFL, **CONP**, ERDS, FDER, INOC, NCFL, NCUN, NMZN, NONT, PNOH, PTOF, RODR, SSTO, STOB, STOC, SYFL.
- Feature Related: **BUSY**, CCTO, CONF, MANL, MHLD, NCII, NCIX, NCTF, NINT, ORAC, ORAF, ORMC, ORMF, PGTO, PMPT, PRSC, RRPA, SRRR, TRRF.
- Resource Shortage: CGRO, CQOV, EMR1, EMR2, EMR3, EMR4, EMR5, EMR6, FECG, GNCT, **NBLH**, NBLN, **NCRT**, NECG, NOSC, **NOSR**, SORD, TOVD.

Basic call OMs

No OMs specific to Basic Call are provided in BCS 30. Use the trunk OMS to monitor call processing performance of the trunk group. No other PRI OMs apply.

Logs

Table 51 lists the DMS-100 logs that apply to DS-1 carriers.

Table 51
DMS-100 logs

Report ID	Alarm Info	Event Type	Event ID	Equip Type	Equip ID
PM109	No change	SYSB Generated when SYSB due to loss of sync, remote alarms, or DS-1 card is removed.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM110	NOALARM	INFO Generated when BPV or SLIP, MTCE, or OOS limits are set or cleared, or when the DS-1 card fails maintenance or is replaced.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM111	NOALARM	INFO Generated when a system-busy carrier is returned to service.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM112	NOALARM	INFO Generated when a carrier slip counter is initialized.	CARRIER_SLIP_INIT	pmtype	pmnbr
PM186	NOALARM	INFO Generated as a general information log for carriers..	CARRIER CARRIER_NO: line_# REASON: char_string opt char_string	pmtype	pmnbr

Maintenance

Maintenance for the DTCI is the same as for the DTC.

- This section provides basic common maintenance procedures.
- For detailed maintenance procedures, including using DS-1 line simulators and error counters, refer to *Documentation list* in the *Overview* for the appropriate NTP.

For successful call processing on the DMS-100, the following conditions must be met:

- The carrier must be in service (INSV).
- The PRI trunk must be in service (IDL).
- The calling and called lines must be in service (IDL).

DS-1 carrier alarms/display

Table 52 lists DS-1 carrier alarms that are displayed in the CARRIER level of the MAP. To access the carrier level of the MAP, use the following command:

MAPCI;MTC;TRKS;CARRIER

Alarms can be visual or audible alarms. The system provides automatic detection and recovery for most faults. If the system is able to recover, the alarm is cancelled and the event is entered into the system log.

The occurrence of errors is controlled by limits entered in table CARRMTC.

Table 52
DMS-100 DS-1 carrier alarms/display

Message	Effects	Remedy
RCGA Remote carrier group alarm (Yellow alarm) FAR END FAULT	Indicates remote alarm detection in receive path. The yellow alarm counter is incremented by 1 for every 10 secs of remote alarm. when the counter reaches 34, the counter is no longer incremented and the trunk is removed from service.	Check the far end.
LCGA Local carrier group alarm (Red alarm) NEAR END FAULT	Indicates a DS-1 card or transmission fault for transmit path.The DS-1 is removed from service; remote alarm pattern sent to far end.	1. Ensure that transmission parameters are correctly set at both ends (see *Correlation tables*.). 2. Run a loopback test (see *Tests)*. 3. Run a continuity test (see *Tests*).
BER Approximated bit error rate. DS-1 DISPLAY	The counter is incremented for every 1K bit errors per day. For ESF, both BPV and CRC errors are reported.	Alarm settings can be altered by changing table CARRMTC

DS-1 carrier alarms/display (continued)

Table 52 (continued)
DMS-100 DS-1 carrier alarms/display

FRME Frame loss error DS-1 DISPLAY	Counter is incremented for every 1K bit errors per day. If frame loss continues for 3 secs or more, the trunk is removed from service. It is restored automatically when frame sync is received continuously for 15 secs.	Alarm settings can be altered by changing table CARRMTC.
SLIP Frame slip (clock sync) error DS-1 DISPLAY	Counter is incremented per frame slip per day.	Alarm settings can be altered by changing table CARRMTC.
ES Errored seconds DS-1 DISPLAY		Alarm settings can be altered by changing table CARRMTC.
SES Severe errored seconds DS-1 DISPLAY		Alarm settings can be altered by changing table CARRMTC.
UAS Unavailable seconds		
State Carrier state DS-1 DISPLAY	Shows INSV, MANB, SYSB, UNEQ (trunks offline).	

DTCI commands

Table 53 provides the maintenance commands for the DTCI. This is the same set of commands as those used for the DTC.

Use the following MAP command to enter the DTCI level of the MAP:

MAPCI;MTC;PM;POST DTCI xx

Table 53
DMS-100 DTCI maintenance commands

Command	Function
POST	Places the specified DTCI in the command position of the MAP.
LISTSET	Displays the current or all PMs in the post set.
TRNSL	Displays the status, message condition and capability of the C- or P-side links.
TST	Perform a controller self-diagnostic.
BSY	Busy the DTCI, one unit, or P-side link.
RTS	Return to service the DTCI, one unit, or P-side link.
OFFLINE	Put DTCI node offline (both DTCI must be in MANB first). **Note:** an offline DTCI will stay in this state over all restarts.
LOADPM	Load both units on the DTCI or select one unit (the unit being loaded must be in the BSY state first). The load file is from the CC.
DISPLAY	Displays the PM types and numbers associated with a particular state.
NEXT	Puts the next PM type in the posted set in the command position of the MAP.
QUERYPM	Displays the equipment location, load information, and the status of the DTCI.
QUERYPM FLT	Display the fault (if any) for each unit of the DTCI.
QUERYPM CNTRS	Display the name of the load for the DTCI.
SWACT	Causes an activity switch to the inactive unit of the DTCI.

DS-1 carrier commands

The carrier level performs all maintenance for PRI (DTCI) DS-1s. To access the carrier level of the MAP, use the following command:

MAPCI;MTC;TRKS;CARRIER; POST DTCI xx

The Display Option command displays the carrier options for the posted circuit, such as card code, options, and alarm thresholds.

A carrier can be looped towards the near (l) or far end (r) by using the following command. The loop is cleared using the (c) option:

LOOP n <l/c/r>

D- and B-channel commands

Although the PRADCH is designed mainly for D-channel maintenance, it can also be used for PRI B-channel maintenance (except for commands CONT and LOOPBK). B-channel maintenance can also use existing MMI commands (see *Documentation List* in the *Overview* for the appropriate NTP).

Note: The control and post position displays are cleared when exiting the PRADCH level.

Use the following MAP command to enter the PRADCH level of the MAP:

MAPCI;MTC;TRKS;TTP;PRADCH

Note: The D-channel cannot be posted at the TTP level of the MAP. It must be posted from the PRADCH level under the TTP level. A B-channel can be posted at the TTP, MANUAL, MONITOR, or PRADCH level of the MAP.

Table 54
DMS-100 PRADCH maintenance commands

Command	Function
POST	Post one or more DS-1 circuits for maintenance. The options supported are: **GD** < CCLI> (post by group--use D-channel CLLI), **BD** < CCLI> (post D and B-channels), **D DTCI** <DTCI#> (post by PM> **D DTCI** <DTCI# CKT> (post by circuit#) **D DTCI** <DTCI# CKT TS> (post by circuit and timeslot) **T** <CLLI> <MEM> (post by trunk member--for B-channels only) The STA (State) field shows the state of the D-channel. See table x.
BSY	Busy out a circuit or put a circuit in the INB state using BSY INB.
RTS	Return the specific channel to service. **Note:** If the DCH is INB, put the DCH in MB state with BSY before RTS.
NEXT	Put the next circuit in the post set in control position.
CONT	Run a continuity test on the a posted PRI D-channel (internal or external).
LOOPBK	Set loopback mode so that the far end is able to run an external continuity test.
HOLD	Place circuit in the hold position.

DTCI states

Table 55 lists the possible states for the DTCI. Note that each unit of the DTCI has a separate state and both units can be in the same state. For the states OFFL and CBSY, both units will always be in the same state.

Table 55
DMS-100 DTCI states

State	Description
CBSY	Both message links to network are out of service.
INSV	PM is in-service with no problems.
ISTB	One or both units installation busy PM overloaded PM load name does not match load name in LTCINV Static data mismatch CSlinks out of service Node redundancy lost Major CSlink failure Critical CSlink failure WARM SWACT turned off Warm SWACT not OK
MANB	Craftsperson has busied the PM.
OFFL	PM is offline (software state).

DTCI states (continued)

Table 55 (continued)
DMS-100 DTCI states

State	Description
SYSB	System busy during CC initialization Diagnostics failed All C-side links are down Reset while in-service Trap message received from PM Autonomous activity drop Unsolicited messages limit exceeded Self-test failed PM audit detect fault Inactive unit lost data sync REX in progress REX failed RTS failed PM SWACT CS cleared RTS Audit detected inconsistent PM activity Audit detected inconsistent PM state No response from XPM during audit Require data load RTS rippling from C-side Messaging fail Reset limit exceeded ESA translation data downloading failed Data message threshold exceeded SWER message threshold exceeded Fault msg threshold exceeded Load corruption suspected Data corruption suspected/detected Incoming message overload condition

DS-1 carrier states

Table 56 lists the possible states for the DS-1 carrier.

Table 56
DMS-100 DS-1 carrier states

State	Description
INSV	DS-1 is in service; no alarms present.
MANB	Manual busy--DS-1 removed from service by craftsperson for maintenance.
OFFL	The DS-1 is offline.
SYSB	The DS-1 is system busy from a remote or local alarm.
UNEQ	The p-side port for the DTCI is unequipped (no datafill exists in table LTCPSINV). Any trunks datafilled for that facility will be offline.

D-channel states

Table 57 lists the possible states for the D-channels.

Table 57
DMS-100 D-channel states

State	Description
CFL	Carrier fail--the carrier is out of service or SYSB.
INB	Installation busy--D-channel is configured in datafill but is not in-service.
INSV	D-channel is in service and available.
LO	Lockout--link level (layer 2) or physical level (Layer 1) failure.
MANB	Manual busy--D-channel removed from service at the MAP.
PMB	Peripheral is MANB.
RNR	Remote not responding-- the link is established and ready but the far end is not responding to PRI messages.

B-channel states

Table 58 lists the possible states for the B-channels.

Table 58
DMS-100 B-channel states

State	Description
CFL	Carrier failed--associated DS-1 failure
CPB	Call processing busy--currently carrying traffic (service busy)
CPD	Call processing deload--circuit carrying traffic but another entity, such as MTCE has requested to be informed when CP releases circuit.
DEL	Deload--CPD circuit is now available.
DFL	D-channel fail--the D-channel is not in service so no signalling for B-channels can take place.
DMB	D-channel manually busy--the D-channel is MB.
IDL	Circuit in service and available; D-channel is in service..
INB	Installation busy--circuit is installed but not yet in service.
INI	Initialized--CPB circuits are initialized after a system restart.
LO	Local failure of a circuit (no response from far end for this circuit).
MB	Manual busy--circuit removed from service by craftsperson for maintenance.
NEQ	Not equipped--circuit hardware not provided.
PMB	Peripheral manual busy--the associated DTCI is out of service.
RMB	Remote manual busy--trunk for incoming calls removed from service by far end.
SB	System busy--circuit removed from service by system maintenance.
SZD	Seized--circuit has been seized for manual or system action.

Tests

Table 59 below lists the tests for verifying network operation at the trunk or link level.

Be sure to BSY the PM at the DCTI level of the MAP before running the tests.

Table 59
DMS-100 tests

Test	Description	Procedure
DTCI Diagnostic	Performs a self-test on the DTCI PM	1. Enter the DTCI level of the MAP. 2. Enter **TST** to test the posted DTCI. 3. A card list is generated if the diagnostic fails. 4. If test fails, check the PM logs for additional information.
Internal Continuity Test	Verifies D-channel operation at the node level.	1. Enter the PRADCH level of the MAP. 2. Enter **POST GD** to identify the DCH. 3. Enter **CONT INT** to start testing.
External Continuity Test	Verifies D-channel continuity to the far end and back. The loopback at the far end must be set at the far end.	1. Enter the PRADCH level of the MAP. 2. Enter **POST GD** to identify the DCH. 3. Contact the far end to ensure loopback mode is set using the **LOOPBACK SET** command. 4. Enter **CONT EXT** to start testing. 5. Ensure that the far end removes loopback mode with the **LOOPBACK TAKEDOWN** command.

TRAVER enhancements

TRAVER is enhanced to include additional translation tables accessed by PRI call processing. These enhancements do not affect translations for non-PRI trunks.

The TRAVER command line format has been changed as follows:

traver <ORIG> |<NPI>| <DIGITS> |<OPT>| <TRACE>

The new fields NPI and OPT can be optionally added for PRI. These fields are used for calls originating on a PRI trunk. These fields do not affect any other type of trunk agency even if they are entered. The information contained in the OPT field is:

- NSF (optional)
- BC (optional)

This information, supplied in the PRI call setup message, enables the translation path for PRI.

Troubleshooting

Table 60 provides troubleshooting procedures for common problems.

Table 60
DMS-100 PRI troubleshooting

Symptom	Procedure
If the DCH is locked out (LO)	Verify the datarate in table TRKSGRP matches that of the far end. Verify the IFCLASS in table TRKSGRP. If connected to another DMS-150, the endpoints of the local connection should have opposite values. Otherwise, the DMS-1=250 is always NETWORK. Verify that the appropriate NT6X50 is in the DS-1 and correctly datafilled in table CARRMTC. Verify the correlation of the transmission characteristics for the link: frame format, line encoding,etc. Use the Protocol Analyzer to verify frame synchronization.
When FF=ESF, yellow alarm indicated when no yellow alarm is being transmitted from the far end.	Put the carrier back into SF format. Make sure the far end is not transmitting yellow alarm and wait for the LCGA to clear. Return the carrier to ESF format.

DMS-250

Basic call service is supported by the following DMS-250 network configurations:

- DMS-250 «» SL-1
- DMS 250 «» SL-100
- DMS-250 «» DMS-100 (future BCS)
- DMS-250 «» DMS-250 (future BCS)

The DMS-250 provides limited support of ESN signaling in private networking applications.

This section describes PRI links for basic call and ESN signaling. Because SS7 is a mature product, SS7 links are not discussed in detail.

This section documents BCS 30 for the DMS-250 and Release 15 for the SL-1. It describes only general parameters for the BCS load.

Engineering planning DMS-250 network options

The DMS-250 supports PRI and SS7 links for ISDN networks. An ISDN link includes the signaling link and associated trunks. Table 61 provides a summary of the DMS-250 network options for basic call.

- PRI links use a message-based, common channel signaling protocol, nB + D. Call control signaling (Q.931) is provided by the D-channel; the B-channels serve as voice/data trunks. The B and D-channels are carried on the PRI interface on one or more DS-1 spans.
- SS7 (or CCS7) links also use a message-based, common channel signaling protocol that separates the signaling link for call control from the voice/data trunks. SS7 trunks are ISDN User Part (ISUP) trunks. ISUP is the call control signaling protocol in SS7.

In common channel signaling protocols a signaling link can occupy the same facility as the voice/data trunks or it can be a separate facility.

Table 61
DMS-250 network options for basic call and ESN

Trunk	PRI		SS7
Mode	PRI only	ITA (PRI + T1 A/B) *(note 1)*	SS7
Restrictions	DMS-100 «» DMS-250 and DMS-250 «» DMS-250 will be provided in a later BCS.		Not available for SL-1 «» DMS-250 links.
BCS Software	BCS 29 minimum		BCS 26 minimum. ESN signaling requires BCS 27.
Capacity	Up to 20 DS-1 spans (1D + 479 B) D-channel: 1 min to 32 max B-channel: 1 min to 479 max *(note 2)* One DS-1 link can carry multiple D-channels.		Refer to the appropriate SS7 NTP.
ESN Support	yes (limited)		yes (limited)

Note 1: With Integrated Trunk Access (ITA), both PRI trunks and PTS trunks (trunks with inband A/B signaling) are allowed on the same DS-1 span. However, special tone receivers (STRs) can not be used on A/B trunks in ITA configurations.

Note 2: One D-channel supports up to 479 B-channels. For reliability, a lower D-channel to B-channel ratio (1D:47B or one D-channel per two DS-1 links) is recommended.

PRI interface considerations

Basic call is configured as part of PRI or SS7 interface installation. Table 62 lists PRI interface requirements and networking considerations and provides a brief overview of PRI datafill for the DMS-250.

- Refer to *PRI Interface* in the *Overview* section for a general description of PRI interface characteristics.

Table 62
DM-250 PRI interface considerations

Link	PRI
Feature Packages (see *Software*)	ISDN PRI, PRI/CCS7 Interworking, Backup D (future BCS)
Implementation	The PRI interface is provided by the DTCI PM. The DTCI is similar to the DTC PM except that it supports both PRI and non-PRI trunk signaling and does not support the Special Tone Receiver (STR) card. All trunk and signaling types valid on DTCs are valid on DTCIs, except for SS7. An ISDN Signaling Preprocessor (ISP) card provides D-channel signaling for the PRI interface. The B and D-channels are associated with DS-1 spans in datafill.
Requirements	The DTCI requires the 6X69AB message switch card, the BX01AA ISP card, and a special load that includes the load for the ISP card. Four C-side ports should be datafilled in LTCINV to connect the DTCI to the network.

PRI interface considerations (continued)

Table 62 (continued)
DM-250 PRI interface considerations

Networking Considerations	A DS-1 channel can be a B-channel, a D-channel , or a nailed up (provisioned) channel. By convention, the D-channel is assigned to channel 24. A DS-1 span can carry multiple D-channels. The D-channels only support B-channels on the same DTCI. Because the DTCI also supports non-PRI trunks, backup trunk groups can be configured on the same DTCI. However, for reliability non-PRI trunk groups should be used for backup, preferably on a different PM. All data calls over a PRI B-channel are transported with bit transparency by removing the PADS associated with the PRI trunk.
Database Configuration for PRI (see *DMS-250 Datafill)*	A PRI trunk group is defined by: • Entering PRA250 for the trunk type in table TRKGRP. • Entering ISDN for the signaling type and defining the D-channel in table TRKSGRP. • Defining each B-channel in table TRKMEM. • Assigning an LTID to the PRI interface as defined in tables LTDEF, LTMAP, and LTCALLS, which is used to route calls .

Basic call service considerations

Table 63 lists basic call service requirements and networking considerations and provides a brief overview of datafill for basic call service on the DMS-250.

- Refer to *Call Processing* in the *Overview* section for a general description of basic call processing on PRI links.

Table 63
DMS-250 basic call service considerations

Link	PRI
Feature Packages	Requires ISDN PRI feature packages only.
Implementation	Basic call is configured as part of PRI installation.
Requirements	None additional
Networking Considerations	Route selection should be set up to select the PRI trunk first with overflow re-routing to the non-PRI trunks. Bearer capability allows you to restrict trunk groups to carry data only, voice only, voiceband data, or a combination of services. If the capability is disallowed, calls requiring that service may not originate or terminate on the PRI interface.
Database Configuration for Basic Call (see *DMS-250 Datafill*)	The call type (received in the setup message NSF IE) and LTID associated with the trunk indexes table LTCALLS for translations and routing. An NPI of private or public is supported. Normal routing applies. Authorized bearer services for the PRI trunk are datafilled in LTDEF as a characteristic of LTID, field OPTIONS. The appropriate IEC translations and screening are defined in table CALLATTR for each call type in table LTCALLS.
Feature Interactions	None

ESN signaling considerations

The DMS-250 provides limited support of ESN signaling in ISA applications. Refer to the *ISA Network Services Guide* (NTP 555-8001-102) for additional information.

Note: ESN PRI interworking on the DMS-250 provides basic call control only to ESN mains; the full set of ESN features is not supported.

Software requirements

Table 64 shows the software dependencies for basic call service for BCS 30 and above. Only those capabilities relating to PRI, basic call service, or ESN signaling on a PRI link are included.

Table 64
DMS-250 basic call and ESN feature packages

Number	Description	Comments
NTXL09AA	ISDN PRI	• PRI links to SL-1, SL-100, and DMS-250 • Includes ESN signaling (limited support).
NTXG49AA (limited release)	PRI/CCS7 Interworking	• Call completion between PRI and SS7 switches

Hardware requirements

Figure 9 shows the basic hardware architecture for PRI links. The necessary equipment includes:

- An ISDN Digital Trunk Controller (DTCI); the DTCI uses the same two-shelf arrangement used by the DTC.
- A Network Termination (NT1); the NT1 performs the terminating functions for the T1 transmission loop and is usually located on the subscriber premises.

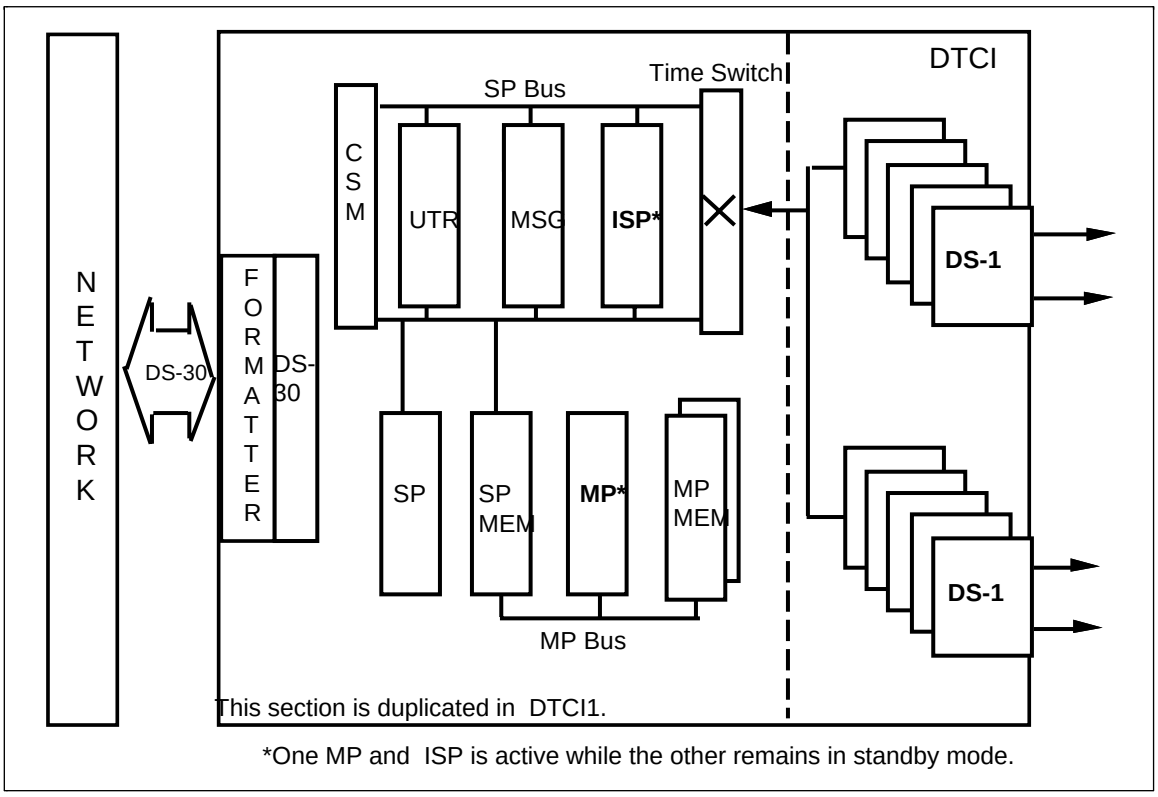
The DTCI can accommodate both PRI and A/B bit trunks within the same shelf. With Integrated Trunk Access (ITA), both A/B bit trunks and PRI trunks can be provisioned on the same DS-1 span.

Note 1: The DTCI does not support SS7 (CCS7 ISUP) trunks.

Note 2: The ISP16, UTR15, and MSG6X69 are also required.

Note 3: The DTCI does not support the STR card.

Figure 9
DMS-250 PRI hardware configuration



Hardware requirements (continued)

Table 65 below describes the basic hardware components of the PRI interface. The DTCI peripheral is the same configuration as a DTC except that the DTCI requires an ISP card in each unit.

Table 65
DMS-250 PRI hardware description

Card	Abbreviation	NT_PEC	Comments
ISDN Digital Trunk Equipment Frame or ISDN Cabinet Trunk Module	DTEI (DMS-250) *(note 1)* MCTM-I (Cabinetized Meridian DMS-250 International)	6X01AB	Up to 2 DTCI units: DTCI1 and DTCI2. The DTCI is available as a unit within a new frame, the DTEI, or as an upgrade kit (NT6X0122) to existing DTCs.
ISDN Digital Trunk Controller	DTCI	n/a	The DTCI consists of two shelves (0 and 1) supporting up to 20 DS-1 links (10 DS-1 cards) for 480 channels. DS-1 cards per shelf:1 min, 5 max . Each DS-1 card serves both DTCI units, under the control of the currently active DTCI unit.
DS-1 Interface Cards	DS-1	6X50AA or 6X50AB *(note 2)*	Slots 1-5 in DTCI. Each card supports two DS-1 links (24 channels). Set switch settings according to distance to cross-connect.
ISDN Signaling Preprocessor	ISP	BX01AA	Slot 16 in DTCI. Supports up to 32 D-channels.
Master Processor	MP	6X45AC	Slot 8 in DTCI.

Note 1: The CPEI (used on other equipment types) is essentially the same as the DTEI.

Note 2:. NT6X50AB card supports both ZCS (AMI) and B8ZS coding and SF or ESF framing formats. NT6X50AA supports ZCS and SF only. See *PRI datafill dependencies* in table 67.

Installation rules

The following rules and recommendations apply to PRI installations. This section assumes that the PRI hardware is properly installed and configured.

Node

1. Install a maximum of 20 DS-1 links for each DTCI.
2. Datafill the DMS-250 according to the sequence in Table 71 and with the appropriate entries, as described in the DMS-250 datafill section.
3. The following recommendations apply to configuring channels:
   - Each 6X50 card supports two DS-1 spans. Install one DS-1 card for every 2 D-channels (assuming 23B +D).
   - Distribute the D-channels over as many DS-1 cards as possible.
   - A minimum of one D-channel for two DS-1 links is recommended.
   - Leave unused B-channels undatafilled or provision them as PTS trunks.

   Note:If the DS-1 is being configured for Integrated Trunk Access (ITA), A/B trunks may be datafilled on non-PRI channels of the DTCI.

4. After datafill, load the DTCI and return it to service from the PM level of the map using the following commands:

   PM POST DTCI <DTCI#>

   BSY PM

   RTS PM

5. Return the carrier to service using the following commands:

   MAPCI;TRK;CARRIER

   POST DTCI <DTCI#>

   BSY ALL

   RTS ALL

Installation rules (continued)

6. Post the B-channels from the MAP and return the B-channels to service using the following MAP commands:
   - to enter the PRADCH level of the MAP --

     MAPCI;MTC;TRKS;TTP;PRADCH
   - to post the B-channels --

     POST G <trunk CLLI>
   - to MB the DCH if INB --

     BSY ALL
   - RTS the posted DCH --

     RTS ALL

   The D-channels will go to DMB state (D-channel mode busy).

7. Post the D-channels from the MAP and return the D-channels to service using the following MAP commands:
   - to enter the PRADCH level of the MAP --

     MAPCI;MTC;TRKS;TTP;PRADCH
   - to post the D-channel --

     POST GD <trunk CLLI> or **POST D** <circuit#>
   - to MB the DCH if INB --

     BSY
   - RTS the posted DCH --

     RTS
8. Run internal continuity tests on the D-channel. See *Maintenance, Tests.*

Network

9. When service is available end-to-end, run external continuity tests on the D-channels. See *Maintenance, Tests.*

DMS-250 datafill Datafill considerations

The following tables show the database parameters associated with configuring PRI and ESN capabilities. These tables describe datafill for dedicated trunking only. To configure ISA on the PRI link, refer to the *ISA Network Services Guide* (NTP 555-8001-102).

- Only entries for the DTCI configuration are listed.
- The PRI interface datafill dependencies are listed in table 67.
- Correlation tables show the parameters that must be coordinated with the far end for network service. See *DMS-250 datafill, correlation Tables.*

Datafill presentation

In the following datafill tables, defaults are presented in **boldface**. Example tuples are presented at the end of a table. An example that is one continuous record may be shown on more than one line due to space limitations. Not all fields in a table may be shown. Only those fields important to PRI, basic call service, or ESN signaling are presented.

Important datafill considerations

The following datafill considerations apply:

- The CLLI name for the trunk group must be consistent throughout the datafill tables.
- Before deleting a code from the CLLI table, it must first be deleted from all tables that reference it (except for the CLLI maintenance table, which requires that the name must first be deleted from table CLLI).
- To extend the CLLI or TRKGRP table, change the value of the field SIZE for the table in the System Data Table (SYSDATA) and do a cold restart. To increase the size of table TRKMEM, change field TRKGRSIZ in table CLLI--no restart is required.
- With the table editor in interactive mode, to increase the value of the trunk group size delete all trunk members in TRKMEM (the trunk group size is set to 0). Then reset to the higher value.
- When changing data for a trunk member, that member must be placed in the INB state.
- A TRKSGRP tuple cannot be changed or deleted unless the D-channel is in INB state.

Datafill sequence

Table 66 shows the datafill sequence for the PRI interface on the DMS-250.The PRI interface is configured first (steps 1-10), then the basic call service tables are filled (steps 11-14).

Steps 11 through 14 must be completed to define the type and level of services to be provided on the PRI interface, including bearer capabilities for the PRI trunks. The mapping of these logical attributes to the physical interface is done through table LTMAP.

Table 66
DMS-250 PRI datafill sequence

		Initial install	Add a trunk mem-ber	Add DS-1 span	Add a C-side link
1. CLLI	Define the trunk group name and size.	X			
2. CLLICDR	Associates the originating CLLI with the terminating trunk group # identified in CDR table.	X			
3. PADDATA	Define the transmit and receive pad values for the trunk group. (Optional; a default pad set is provided.)	OPT			
4. TRKGRP	Configure the trunk group.	X			
5. LTCINV	Identify the DCTIs to the system software (C-side port #).	X			X
6. CARRMTC	Configure DS-1 carrier and set error rates and alarms. (Optional; a default tuple for 64K clear is provided.)	OPT			
7. LTCPSINV	Identify the DS-1 cards that are associated with a DTCI to the software (P-side port #) and datafill IID for PRI.	X		X	X
8. ADJNODE	Define the connection type and software versions of adjacent nodes.	X			
9. TRKSGRP	(sub of TRKGRP) Define the D-channel for the trunk group	X			

Datafill sequence (continued)

Table 66 (continued)
DMS-250 PRI datafill sequence

		Initial install	Add a trunk mem-ber	Add DS-1 span	Add a C-side link
10. TRKMEM	Define the trunks (B-channels) for the trunk group.	X	X	X	X
11. LTDEF	Define the logical terminal (LT) and access privileges.	X			
12. CALLATTR	Specify translations and screening parameters for the LTID and call type.	X			
13. LTCALLS	Reference the initial translations associated with the call.	X			
14. LTMAP	Maps an LTID to the CLLIs of the PRI trunk group.	X			

CLLI table

Step 1: CLLI Define the trunk group name and size.

Note:The maximum number of CLLI codes is 8191.

Field	Entry	Description	Requirements	Comments
CLLI	alphanumeric (up to 12 characters)	trunk group name	Same as GRPKEY in TRKGRP. Use a period (.) or underline (_) to separate fields (leave no blanks)	It is recommended that you include PLACE, PROV, BLDG, TRAFUNIT, SUFX in this entry.
ADNUM	0 to one less than the CLLI table size	administrative trunk group number		
TRKGRSIZ	0-2047	the # of trunk group members	Use a number greater than the number of initial working trunks.	Because the trunk members must be on the same DTCI, the maximum number of PRI trunks is 480.
ADMININF	alphanumeric (up to 32 characters)	administrative information used by the operating company.	Use alphanumeric characters and underscores only. Use a period (.) or underline (_) to separate fields (leave no blanks).	It is recommended that you use TRAFCLS, OFFCLS, TRKGRTYP for this entry.
Example: **K2KPRA64CLL1 100 24 PH_43_IT**				

CLLICDR table

Step 2: CLLICDR Associates the originating CLLI with the terminating trunk group # identified in CDR table.

Field	Entry	Description	Requirements	Comments
CLLI	alphanumeric (up to 12 characters)	the CLLI name is the key field to the table		
EXTNUM	0-4095	Enter the trunk# to be associated with the CLLI name in CDR		Maps outgoing trunks to incoming trunks for billing.
Example: **K2KPRA64CLL1 195**				

PADDATA table

Step 3: PADDATA Define the transmit and receive pad values (optional)

Note: Use the default pad values provided or enter new values according to distance and hardware constraints.

Field	Entry	Description	Requirements	Comments
PADKEY		=subfields PADGRP1 and PADGRP2.	Must match field PADGRP in table TRKGRP.	Memory is automatically allocated for 64 pad groups. Up to 23 pad groups can be customer defined.
PADGRP1	alphanumeric (up to 4 characters)	pad group 1 name	Enter NPDGP if no PADS are desired.	Use a reserved or a customer-defined pad group.
PADGRP2	alphanumeric (up to 4 characters)	pad group 2 name	Enter NPDGP if no PADS are desired.	Use a reserved or a customer-defined pad group.
PAD1TO2	0 to 14L	the network transmit pad		If a reserved pad group is used, this value is automatically set.
PAD2TO1	0 to 14L	the network receive pad		If a reserved pad group is used, this value is automatically set.
Example**:** **PRAC UNBAL 2L 0**				

TRKGRP table

Step 4: TRKGRP Configure the trunk group.

Note 1: Maximum Size = 2048 trunk groups; maximum # of LTIDs = 1022.

Note 2: This table applies includes only those fields that apply to all customers. Refer to the appropriate customer NTP for fields specific to different customer groups.

Field	Entry	Description	Requirements	Comments
GRPKEY		= subfield CLLI		
CLLI	alphanumeric (up to 12 characters)	CLLI name for the trunk group	Same as trunk group name in CLLI table.	
GRPTYP	PRA250	trunk group type		This entry determines what fields are required.
TRAFSNO	0-15 or 0-127	Traffic separation number in table TRAFINT for the trunk group. Allows peg counts by type of call.	If not required, enter 0.	0-127 with optional traffic separation software NTX085AA.
PADGRP	alphanumeric (up to 10 characters)	pad group name for the trunks group	Enter NPDGRP if no PADS are desired. Must match PADKEY in table PADDATA.	
NCCLS	NCRT, NCTC, NCLT, NOSC, NCBN, NCID, NCOT, NCIT, NCIN, NCON, NCOF	No Circuit Class type-used to select OM register for unavailable facilities and GNCT		

TRKGRP table (continued)

Step 4: TRKGRP (continued).

Field	Entry	Description	Requirements	Comments
CUSTOMER	customer name	**Important:** The datafill for this table is customer-specific. Refer the appropriate customer NTP for customer-specific entries.		
OHQTERM	Y or **N**	Enter Y if calls terminating on this trunk group are allowed offhook queuing.		
ZONE	0-15, A, B, C, ZONE	Specifies the zoning of the trunk agency--used to determine if echo canceller is needed.		
SELSEQ	ASEQ, DSEQ, or **MIDL**	Select sequence--selects the next idle trunk member in ascending (ASEQ), descending (DSEQ), or most idle (MIDL) sequence.	To SL-100, DMS-100, and DMS-250: Must have opposite values (ASEQ or DSEQ) at each end. To SL-1: Use ASEQ with LIN in the SL-1, or use MIDL with RRB in the SL-1.	Used to reduce B-channel glare. See *Correlation tables*.
ALTTRTMT	Y or N	Enter Y if calls originating on this trunk group will use the ALTERNAT subtable within table TMTCNTL when routing to a treatment.		

TRKGRP table (continued)

Step 4: TRKGRP (continued).

Field	Entry	Description	Requirements	Comments
TRAFCLAS	**NIL**, LINE, INTERCEPT, REPAIR, XX, IR, CA, DD, IA, IE, IT, LW, MN, MT, OA, RC, SP, TC, TE, TG, TM, TO, TS, TT, TW, AL, AN, CB, CD, CP, CS, DA, DS, IN, MA, MB, NT, OF, OW, PS, RR, RS, SC, SO, TA, TI, TK, TP, VC, BR, WE, MI, ON, BL, IM, OT, DL, BD, ID.	The traffic usage class to which the trunk group is assigned.		
TIMEBIAS	-12 to 12	Specifies the difference in hours between the originating trunk group and the DMS.	Enter 0 if there is no time difference.	For example, if a call originates in CA and enters the DMS in TX, TIMEBIAS = -2. Required to apply the Restricted Usage by Date and Time feature.
OHQ	Y or N	Enter Y if incoming calls from this trunk group may use offhook queuing.		

TRKGRP table (continued)

Step 4: TRKGRP (continued).

Field	Entry	Description	Requirements	Comments
SNPA	numeric (up to 3 characters) or NIL	Specifies the 3-digit NPA the trunk serves.		The default is 001.
IEXCLINX	0-255	Where the trunk group is incoming or two-way, enter the index into table IEXCLUDE, which consists of NPAs and NXXs to block or allow.		Enter 0 if incoming exclusion is not required.
FASTIDGT	2-30	Contains the # or seconds to wait after MINDIGIT digits have been collected before an interdigital timeout occurs.		
MCCS	Y or N	Enter Y if travel card calls are allowed on this trunk group.		
ACCT_CODE_PROMPT_TONE	Y or N	Enter Y if a prompt tone is presented to the customer when account collection from originating customers is needed.		

TRKGRP table (continued)

Step 4: TRKGRP (continued).

Field	Entry	Description	Requirements	Comments
LTID	$	= subfields LTGRP + LTNUM	Enter a $. An LTID is required for each trunk CLLI.	This is a read-only field. If the trunk group is not associated with an LTID in table LTMAP, this field will display $ and the PRI is inaccessible.
LTGRP		logical terminal group name	This field will be updated with the LTGRP entry in LTMAP.	Not prompted.
LTNUM		logical terminal group#	This field will be updated with the LTNUM entry in LTMAP.	Not prompted.
For an example tuple refer to the appropriate customer NTP.				

LTCINV table

Step 5: LTCINV Identify the DCTIs to the system software (C-side port#)

Note: Memory is automatically allocated for a maximum of 128 tuples.

Field	Entry	Description	Requirements	Comments
LTCNAME		= subfields XPMTYPE + XPMNO.		Automatically adds entries to LTCPSINV.
XPMTYPE	DTCI	peripheral module type		
XPMNO	0-511	peripheral module#		
FRTYPE	DTE	frame type for the XPM		
FRNO	0-511	frame# for FRTYPE		
SHPOS	18, 32, 51, 65	shelf position of the frame (inches)		
FLOOR	0-99	floor location of PM		
ROW	A-H, J-N, P-Z, AA-HH, JJ-NN, PP-ZZ	row location of PM		
FRPOS	0-99	bay position in row of PM		
EQPEC	6X02AA	the PEC of the XPM (DTEI)		
LOAD	alphanumeric (up to 8) characters	issue of peripheral module software		The ISP load is included in the DTCI load.

LTCINV table (continued)

Step 5: LTCINV (continued).

Field	Entry	Description	Requirements	Comments
EXECTAB	vector with 1-8 members	= subfields TRMTYPE, EXEC, and CONTMARK	PRAB UTR50 must be entered for PRI. At least one entry is required.	For ITA, the DMS-250 supports two execs for the DTCI: •AB250 UTR250 •PRAB UTR250
TRMTYP	PRAB or AB250	PM terminal type: AB250 for DMS250 trunks, or PRAB for PRI trunks.		
EXEC	UTR250	Specifies the set of executive programs for TRMTYP.	Maximum # is 8.	
CSLINKTAB	vector with 3-16 members	= subfields NMNO, NMPORT, and CONTMARK		
NMNO	0-31	the network module# assigned to XPM	Must correspond to the C-side links 0-15 of the PM.	
NMPORT	0-63	network port# for NMNO		
OPTCARD	ISP16, MSG6X69, and UTR15	Defines XPM optional cards	Enter ISP16, UTR15, and MSG6X69--all are required for the DTCI.	UTRs, if installed, are supported only in slot 15.

LTCINV table (continued)

Step 5: LTCINV (continued).

Field	Entry	Description	Requirements	Comments
TONESET	DEFAULT or NORTHAM	tone set type	Enter DEFAULT if the switch is not equipped with a RAM6X69. Enter NORTHAM for North American tone set.	
PECS6X45	6x45AC	PEC for Master Processor	One PEC is required for each unit of the XPM. Enter PEC for unit 0 first.	
OPTATTR	$	optional attributes	Enter $.	
PEC6X40	**6X40AA,** 6X40AB, or 6X40AC	PEC for DS-30 interface card.		
Example: **DTCI 0** **DTE 0 18 0 A 7 6X02AA** **DTI29BP1** **(AB250 UTR250) (PRAB DTC250) $ (0 20) (0 21) (1 20) (1 22) (0 4) (1 4) (0 6) (1 6) (0 22) (1 21) (0 23) (1 23) (0 5) (1 5) (0 7) (1 7) $** **(UTR15) (MSG6X69) (ISP16) $** **DEFAULT 6X45AC 6X45AC $ 6X40AC**				

CARRMTC table

Step 6: CARRMTC Configure DS-1 carrier and set error rates and alarms (optional).

Note 1: You may use the default tuple for 64K clear provided or enter new values in the CARRMTC table. If DEFAULT is entered for CARRIDX in table LTCPSINV, the table does not appear.

Note 2: Data contained in this table is referred to in table LTCPSINV, field CARRIDX. Data in this table must be consistent with the datafill in TRKSGRP. See PRI datafill dependencies in table 67.

Field	Entry	Description	Requirements	Comments
CSPMTYPE	DTCI	C-side node PM type.		
TMPLTBM	**DEFAULT** or alphanumeric (up to 16 characters)	the template name for the PM	DEFAULT is the initial entry provided. DEFAULT templates cannot be deleted and can be changed only by Telco.	Referred to in table LTCPSINV to provide maintenance for DS-1 links.
RTSML	0-**255**	warning limit for times returned to service during the audit interval.		Enter 255 to disable this feature.
RTSOL	0-**255**	out-of-service limit for the audit interval		Enter 255 to disable this feature.
ATTR		= subfield SELECTOR.		
SELECTOR	DS1	carrier type	Enter DS1 when CSPMTYPE = DTCI.	This entry determines what fields are required.

CARRMTC table (continued)

Step 6: CARRMTC (continued).

Field	Entry	Description	Requirements	Comments
CARD	NT6X50AA , **NT6X50AB** **,** or NT6X50EC	PEC code for DS-1 card.	See *PRI datafill dependencies*, table 67.	NT6X50AA does not support 64K clear data links or ESF.
If CARD = NT6X50EC, the following field is required:				
ECHOI	ACCESS or NETWORK	Specify that echo cancellers are positioned on the ACCESS side or on the NETWORK side.		
The following fields are required for all CARD types:				
VOICELAW	MU_LAW or A_LAW	voice law used by the carrier	Enter MU_LAW.	This is the 1.544 Mbps, 24-channel PCM system used in North America. A_LAW is used mainly in international switches.
FF	SF or ESF	superframe (SF) or extended superframe (ESF) frame format	Must correspond with DS-1 card code. See *PRI datafill dependencies*, table 67.	
ZLG	ZCS or B8ZS	zero logic line coding scheme for the DS-1	Use ZCS if repeaters or near end switch can't handle B8ZS. See *PRI datafill dependencies*, table 67.	

CARRMTC table (continued)

Step 6: CARRMTC (continued).

Field	Entry	Description	Requirements	Comments
BERB	BPV or CRC	bit error rate base	See *PRI datafill dependencies*, table 67.	
DLK	**NILDL**	data link--used for transmitting yellow alarm	Enter NILDL for nil data link. See *PRI datafill dependencies*, table 67.	Only NILDL is currently supported.
IAT	Y or **N**	inhibit alarm transit: transmit yellow alarm (N) or inhibit yellow alarm (Y).		
LCGAST	1-**250**-9999	local carrier group alarm set threshold in units of 10 msecs	A value of 250 is recommended.	
LCGACL	1-**1000**-9999	local carrier alarm clear threshold in units of 10 msecs	A value of 300 is recommended.	
RCGAST	1-**50**-9999	remote carrier alarm set threshold in units of 10 msecs		
RCGACL	1-**50**-9999	remote carrier alarm clear threshold in units of 10 msecs		
AISST	1-**150**-9999	alarm indicator signal set threshold in units of 10 msecs		

CARRMTC table (continued)

Step 6: CARRMTC (continued).

Field	Entry	Description	Requirements	Comments
AISCL	1-**1000**-9999	alarm indicator signal clear threshold in units of 10 msecs		
BEROL	**3**-6	BER out-of-service limit		3=>10K in 6 secs 4=>10K in 66 secs 5=>10K in 660 secs 6=>10K in 6600 secs
BERML	4**-6-**7	BER maintenance limit		4=>10K in 66 secs 5=>10K in 660 secs 6=>10K in 6600 secs 7=>10K in 660K secs
ES	0-**864-**9999	error second threshold in units of 10 msecs		
SES	0-**100**-9999	severe error second threshold in units of 10 msecs		
FRAMEML	0-**17**-9999	loss of frame alignment maintenance limit		Table OFCENG also records these limits.
FRAMEOL	0-**511**-9999	loss of frame alignment out-of-service limit	FRAMEOL should be larger than FRAMEML or only FRAMEOL will be used.	Table OFCENG also records these limits.

CARRMTC table (continued)

Step 6: CARRMTC (continued).

Field	Entry	Description	Requirements	Comments
SLIPML	0-**4**-9999	frame slip maintenance limit		Table OFCENG also records these limits.
SLIPOL	0-**255**-9999	frame slip out-of-service limit	SLIPOL should be larger than SLIPML or only SLIPOL will be used.	Table OFCENG also records these limits.

Example for 64K clear (this is the default tuple):

```
DTCI   DEFAULT 255   255 DS1  NT6X50AB MU_LAW SF  B8ZS BPV
NILDL          N 250 1000 50 50 150 1000 3 6 864 100
               17 511  4   255  $
```

Example for 64K restricted and 56K:

```
DTCI        ZCS       255   255 DS1  NT6X50AB MU_LAW SF  ZCS BPV
NILDL                 N 250 1000 50 50 150 1000 3 6 864 100
                      17 511  4   255  $
```

LTCPSINV table

Step 7: LTCPSINV Identify the DCTIs to the system software (P-side port#) and datafill IID for PRI.

Note: An entry in this table is automatically added when you add a DTCI to table LTCINV. Memory is automatically allocated for a maximum of 128 tuples.

Field	Entry	Description	Requirements	Comments
LTCNAME		= subfields XPMTYPE and XPMNO.		
XPMTYPE	DTCI	peripheral module type		
XPMNO	0-511	peripheral module#		
PSLNKTAB	vector with 0-19 members	= subfields PSLINK + PSDATA + CARRIDX + ACTION + IID.	Use DS1PRA for PRI or ITA. Use DS-1 for AB bit signaling without ISDN.	DTCI supports DS1 and DS1PRA.
PSLINK	0-19	P-side port#		
PSDATA	DS1PRA or NILTYPE	P-side interface	If carrier requires ISDN, enter DS1PRA. Enter NILTYPE if that carrier is not equipped on the DTCI.	DTCI supports DS1 and DS1PRA. For DS1, datafill CARRIDX and ACTION. For DS1PRA, datafill CARRIDX, ACTION, and IID.
CARRIDX	DEFAULT or valid template name datafilled in CARRMTC.	Index into table CARRMTC.	An entry for the PM type must already exist in table CARRMTC.	See *PRI datafill dependencies*, table 67.

LTCPSINV table (continued)

Step 7: LTCPSINV (continued).

Field	Entry	Description	Requirements	Comments
ACTION	Y or N	Remove carrier from service (Y) if FRAMEOL, SLIPOL, ES, or SES is exceeded.		
IID	0-31	The interface ID identifies the DS-1 spans associated with the D-channel.	For a single DS-1 span use 0. For multiple DS-1 spans per trunk group, a different ID is required for each DS-1 in the trunk group.	Do not use 1 if connected to the SL-1.
Example: **DTCI 0** **(0 DS1PRA DEFAULT N 0) (1 DS1PRA DEFAULT N 0)** **(2 DS1PRA DEFAULT N 0) (3 DS1PRA DEFAULT N 0)** **(4 DS1PRA DEFAULT N 0) (5 DS1PRA DEFAULT N 0)** **(6 DS1 DEFAULT N) (7 DS1 DEFAULT N)** **(8 DS1 DEFAULT N) (9 DS1 DEFAULT N) $**				

ADJNODE table

Step 8: ADJNODE Define the connection type and software version of adjacent nodes

Note 1: The maximum number of tuples is 4096.

Note 2: The tuple in this table can be used by many different TKSGRP entries.

Field	Entry	Description	Requirements	Comments
ADJNODEK	alphanumeric (up to 12 characters)	adjacent node key--enter the names for each adjacent switch	It is recommended that you use type and version to identify the adjacent switch.	Referenced in table TRKSGRP, field ADJNODE.
SIGDATA	PRA	=PRODUCT + VERNUM subfields	Enter PRA for a PRI trunk.	
PRODUCT	For PRI: DMS, SL1, OTHER	adjacent switch type		
VERNUM	0 to 32767	software version in adjacent switch	Eliminate the decimal if used. This field must be updated if the software is updated in the adjacent node.	Use the BCS for DMS nodes; use the release number for SL-1s.
Example: **PRASL115 PRA SL1 15**				

TRKSGRP table

Step 9: TRKSGRP Define the D-channel for the trunk group.

Note:Table size is automatically set at two times the number of trunk groups. Maximum size: 2048 trunk subgroups.

Field	Entry	Description	Requirements	Comments
SGRPKEY		= subfields CLLI + SGRP		To configure ITA on the DTCI, datafill the non-PRI trunk subgroups in table TRKSGRP along with the PRI trunk subgroups.
CLLI		CLLI trunk group name		
SGRP	0	subgroup#		Only one subgroup (subgroup 0) is allowed per PRI interface.
CARDCODE	DS1SIG	card code	DS1SIG is required for ISDN PRI.	
SGRVAR		= subfields SIGDATA through DCHBCKUP below.		
SIGDATA	ISDN	The call processing protocol.	ISDN is the only valid field for a PRI trunk.	This entry determines what fields appear.
PSPDSEIZ	2-30	the time in seconds that the trunk must wait to receive the first digit		Applies only to inband DTMF digits.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
PARTDIAL	2-30	the time in seconds that the trunk must wait to receive each digit after the first digit		Applies only to inband DTMF digits.
VERSION	87Q931	the D-channel protocol version	Only this value is supported.	
CRLENGTH	1-2	Call reference length (# of octets)	The only value supported is 2.	
BCHNEG	Y or N	Allow B-channel negotiation (Y) or disallow (N).	The only value supported is N.	Not currently supported.
BCHGLARE	YIELD or STAND	The near end is assigned priority in call collisions (STAND) or the far end is to have priority (YIELD).		When a call collision occurs, an entry of YIELD causes the call to be taken down and another trunk is selected.
IFCLASS	NETWORK	The interface class defines the ends of the link for PRI message exchange.	The DMS-250 is always NETWORK. The far end must be datafilled as USER or SLAV (SL-1 only) for this interface to operate.	
CONFIG	PT_PT or PT_MLT_PT	the broadcast procedure for the PRI interface	PT_PT is the only option supported by PRI.	Broadcast links (PT_MLT_PT) are used with BRA only.

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
LOCATION	PVTNET	the Q.931 Progress Indicator (PI IE) location	Enter PVTNET for the DMS-250.	The far end should be datafilled according to equipment type: LOCALEO for DMS-100 or USER for SL-1 or SL-100.
SAT	Y or N	satellite switched--Yes (Y) or No (N)	N is the only value supported.	
ECSTAT	INTERNAL, EXTERNAL, INNOTONE, UNEQ	echo canceller status	Enter INTERNAL when the echo cancellers are equipped on the NT6X50EC card in the DTCI frame and are enabled by call processing when the call is not a data call. This value is not allowed when echo suppressor is enabled. Enter EXTERNAL when echo cancellations are performed by external equipment and no call processing is involved. Use INNOTONE when internal echo cancellers are to be used, but the 2100 Hz tone is turned off. This value is not allowed when echo suppressor is enabled. Enter UNEQ when no echo cancellers are equipped on this subgroup.	

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
TRKGRDTIM	1-**30**-255	trunk guard timer in units of 10 msecs--this is the time that the trunk waits after sending a DISCONNECT message and before putting the trunk into IDLE.	For PRI, a minimum value of 30 (300 msec) is recommended.	If the timer expires again after a second disconnect attempt, the B-channel is put into a LO state until a restart procedure is completed.
ADJNODE	alphanumeric (up to 12 characters)	index into table ADJNODE	Same as ADJNODEK in table ADJNODE.	
L1FLAGS	Y or N	Indicates whether or not the DTCI sends Layer 1 flags when the D-channel is in flagfill mode.	Enter N for DMS-to-DMS connections and Y for DMS-to-other vendor connections.	
DCHNL		the primary D-channel for this PRI interface. It includes subfields PMTYPE through HDLCTYPE below.		This field cannot be changed or deleted unless the D-channel is in INB state.
PMTYPE	DTCI	PM type	Use DTCI for BCS 30 and later.	
DTCINO	0-511	DTCI PM#		
DTCICKTNO	0-19	DS-1 span on the DTCI for the D-channel.		
DTCICKTTS	1-24	DS-1 timeslot for the D-channel.		

TRKSGRP table (continued)

Step 9: TRKSGRP (continued).

Field	Entry	Description	Requirements	Comments
DCHRATE	64K or 56K	D-channel transmission rate	See *PRI datafill dependencies*, table X.	The D-channel rate should match the data rate datafilled for the DS-1 carrier.
HDLCTYPE	HDLC or INVHDLC	Indicate the bit format for PRI messages as follows: HDLC for High Level Data Link or INVHDLC for inverted HDLC.	See *PRI datafill dependencies*, table X.	INVHDLC is a format in which all 0's are changed to 1's and vice versa. Some ISDN vendors use INVHDLC for PRI.
DCHBCKUP		the backup D-channel. It includes subfields PMTYPE through HDLCTYPE above.	Not currently supported. Enter a $ for BCS30.	
Example:				
D250S100CPR 0 DS1SIG				
ISDN 8 12 87Q931 2 N STAND NETWORK PT_PT PVTNET N UNEQ 170 PRASL115 DTCI 0 0 24 64K HDLC$				

TRKMEM table

Step 10: TRKMEM Define the B-channels for the trunk group.

Note:Table size is automatically determined according to field TRKGRPSIZ in table CLLI for each trunk group configured.

Field	Entry	Description	Requirements	Comments
CLLI		CLLI name for the trunk group	Must match trunk group name in CLLI table.	
EXTRKNM	0-9999	the external trunk#		
SGRP	0	trunk subgroup#	Same as SGRP in table TRKSGRP.	Always 0 for PRI trunks.
MEMVAR		= subfields PMTYPE + DTCNO + DTCCKTNO + and DTCCKTTS		
PMTYPE	DTCI	PM type		
DTCNO	0-511	DTCI # for the trunk group	Must match DTCINO in table TRKSGRP.	The B-channels must be on the same DTCI as the D-channel.
DTCCKTNO	0-19	DS-1 span on the DTCI for the B-channel.	This carrier must be datafilled in LTCPSINV as DS1PRA.	
DTCCKTTS	1-24	DS-1 timeslot for this trunk member		

TRKMEM table (continued)

Step 10: TRKMEM (continued).

Examples:

```
D250S100CPR          1    0    DTCI   0   0    1
D250S100CPR          2    0    DTCI   0   0    2
D250S100CPR          3    0    DTCI   0   0    3
```

To configure ITA on the DTCI, datafill non-PRI trunk members along with PRI B-channels.

Examples:

```
K2KPRA64CLLP1  1  0  DTCI  10 0  1
K2KPRA64CLLP1  2  0  DTCI  10 0  2
K2KPRA64CLLP1  3  0  DTCI  10 0  3
K2KABTRK1      1  0  DTCI  10 0  4
K2KABTRK1      1  0  DTCI  10 0  5
```

LTDEF table

Step 11: LTDEF Define the logical terminal (LT) and access privileges.

Field	Entry	Description	Requirements	Comments
LTKEY		LTID	Same as LTID in table LTDATA.	The LT group of the LTID must first be datafilled in LTGRP if anything other than ISDN is used.
LTAP	B,D,PB, or BD	LT access privileges	Enter B for PRI (circuit-switched).	
CLASSREF		= subfield LTCLASS		
LTCLASS	PRA	LT class		Defines the fields required and the services allowed.
NUMBCHNL	1-479	the # of B-channels that the LTID is allowed to use at any one time per trunk group.		
NUMCALLS	1-479	the # of calls allowed on the LTID at one time.	This entry should be the same as the NUMBCHNL entry. The sum of the incoming calls and outgoing calls must be less than or equal to the number of calls allowed.	

LTDEF table (continued)

Step 11: LTDEF (continued).

Field	Entry	Description	Requirements	Comments
INCCALLS	0-479	the # of reserved incoming only calls allowed on the LTID at one time		Not used. Enter any number.
OUTCALLS	0-479	the # of reserved outgoing only calls allowed on the LTID at one time		Not used. Enter any number.
OPTIONS	vector with up to 4 members: NOVOICE, NOVBD, NOCMD, **NOPMD**	Defines the bearer capabilities for the LTID. It defines the types of calls not allowed: NOVOICE for no voice calls, NOVBD for no voice-band data calls, NOCMD for no circuit-mode data calls, and NOPMD for no packet-mode data calls.	Enter NOPMD for this BCS.	Applies to incoming and outgoing calls.
Example:				
ISDN 6 B PRA 25 25 12 12 NOPMD $				

CALLATTR table

Step 12: CALLATTR Specify translations and screening parameters for the LTID and call type.

Note: Refer to the ISA Network Services guide (NTP 555-8001-102) for configuring this table for ISA.

Field	Entry	Description	Requirements	Comments
CATTRIDX	0-2047	key to table CALLATTR		Multiple entries allowed.
CUSTOMER	**Important:** The datafill for this table is customer specific. Refer the appropriate customer NTP for customer-specific entries.			
OPART	0-800	the originating partition for a trunk group.		
PRTNM	NPRT or other alpha-numeric (up to 4 characters)	pretranslator name for incoming trunks.	Enter NPRT for outgoing trunks not requiring pretranslation.	
COS	0-119	class of service screening index		
SCRNCLS	NSCR, SMX1, or alphanumeric (up to 4 characters)	screening class table name		
ZEROMPOS	NONE or alphanumeric (up to 4 characters)	position out of table to which 0- (zero minus) calls are to be routed.	Enter NONE if 0- calls will not be routed on this trunk group.	

CALLATTR table (continued)

Step 12: CALLATTR (continued).

Field	Entry	Description	Requirements	Comments
VAUTHFLD	vector of up to 15 characters or NOAUTHS	valid authorization code filed for call type	Enter NOAUTHS when no authorization code digits are filed with the trunk group. The authcodes entered must be datafilled in the authcode tables.	
ADIN	**0**-99	authcode database index number		
PRIVDIAL	ESN or NIL	ESN trunk indicator	Use ESN to identify an ESN trunk; otherwise, use NIL.	
Example: **1 511 P250 0 NSCR NONE 435432 0 NIL**				

LTCALLS table

Step 14: LTCALLS Provides the initial translations associated with the call type.

Field	Entry	Description	Requirements	Comments
LTID		the LTID from table LTDATA		
CALLTYPE	PUB, WATS, FX, TIE, INWATS, PVT	Defines the call type allowed on this PRI interface.		The datafill for this field is customer specific.
XLARTSEL		= subfields XLARTE + CALLATTR + RTEID.		
XLARTE	XLAIEC	Identifies how the digits for PRI calls are to be translated.	Only XLAIEC is allowed.	
CALLATTR	0-2047	index into table CALLATTR		Required when XLARTE = XLAIEC.
RTEID	$	The routing table and index into that table	Use$ when XLARTE = XLAIEC.	
OPTIONS	$	Not used.	Enter $ for this BCS.	
Example:				
ISDN 555 PUB XLAIEC 52 $ $.				

LTMAP table

Step 14: LTMAP Maps the LTID to the CLLIs of PRI trunk groups.

Field	Entry	Description	Requirements	Comments
LTID		LTKEY from table LTDEF indexes this table.		Automatically updates LTID field in table TRKGRP.
MAPTYPE	CLLI			Always set to CLLI for PRI.
CLLI		CLLI name for the trunk group	Must match CLLI name in table TRKGRP.	
OPTIONS	TEI 0		Enter TEI 0 for every LTID entry.	TEI is the only supported option for PRI.
Example: **ISDN 555 CLLI K2KPRA64CLLP1 TEI 0 $**				

Routing tables

The DMS-250 uses the following routing tables for basic call service over PRI: OFRT, HNPACONT.RTEREF, and FNPACONT.RTEREF.

- OFRT provides the routing for POTS calls.
- HNPACONT.RTEREF provides three- to six-digit routing.
- FNPACONT.RTEREF provides six- to ten-digit routing

There are no changes to these tables for dedicated trunk routing.

- For ISA routing refer to NTP 555-8001-102.

Configuring backup trunk groups

Because the DTCI also supports non-PRI trunks, backup trunk groups can be configured on the same DTCI. The backup trunk group can be configured as a single two-way trunk group or as two one-way trunk groups.

The following example tuple for table OFRT shows how this can be implemented.

Table OFRT tuple:

99	**S**	**N**	**N**	**N**	**DMS2MSLPRA**
	S	**N**	**N**	**N**	**DMS2MSLDAL**

In this example, when a user dials the code for the PRI trunk, the call is routed using route OFRT 99. Calls are first offered via the PRI group DMS2MSLPRA. If this trunk group is 100% busy, out of service, or experiences protocol failure during the call setup, the call will be re-offered on the DAL trunk DMS2MSLDAL. Calls incoming on DMS2MSLDAL should be handled the same as calls incoming on DMS2MSLPRA.

PRI datafill dependencies

Table 67 lists the datafill dependencies in the DS-1 span. The datafill entered for table CARRMTC must be consistent with the datafill in table TRKSGRP.

Table 67
DMS-250 PRI datafill dependencies

CARRMTC table					***TRKSGRP table***	
CARD	**FF**	**ZLG**	**BERB** *(note 1)*	**DLK** *(note 2)*	**DCHRATE**	**HDLCTYPE**
NT6X50AA	SF	ZCS	BPV	NILDL	56K or 64K	HDLC or INVHDLC
NT6X50AB	SF	ZCS	BPV	NILDL	56K or 64K	HDLC or INVHDLC
		B8ZS	BPV	NILDL	64K	HDLC or INVHDLC
	ESF	ZCS	CRC	NILDL	56K or 64K	HDLC or INVHDLC
		B8ZS	CRC	NILDL	64K	HDLC or INVHDLC

Note 1: When CRC is entered, both BPV and CRC are used.

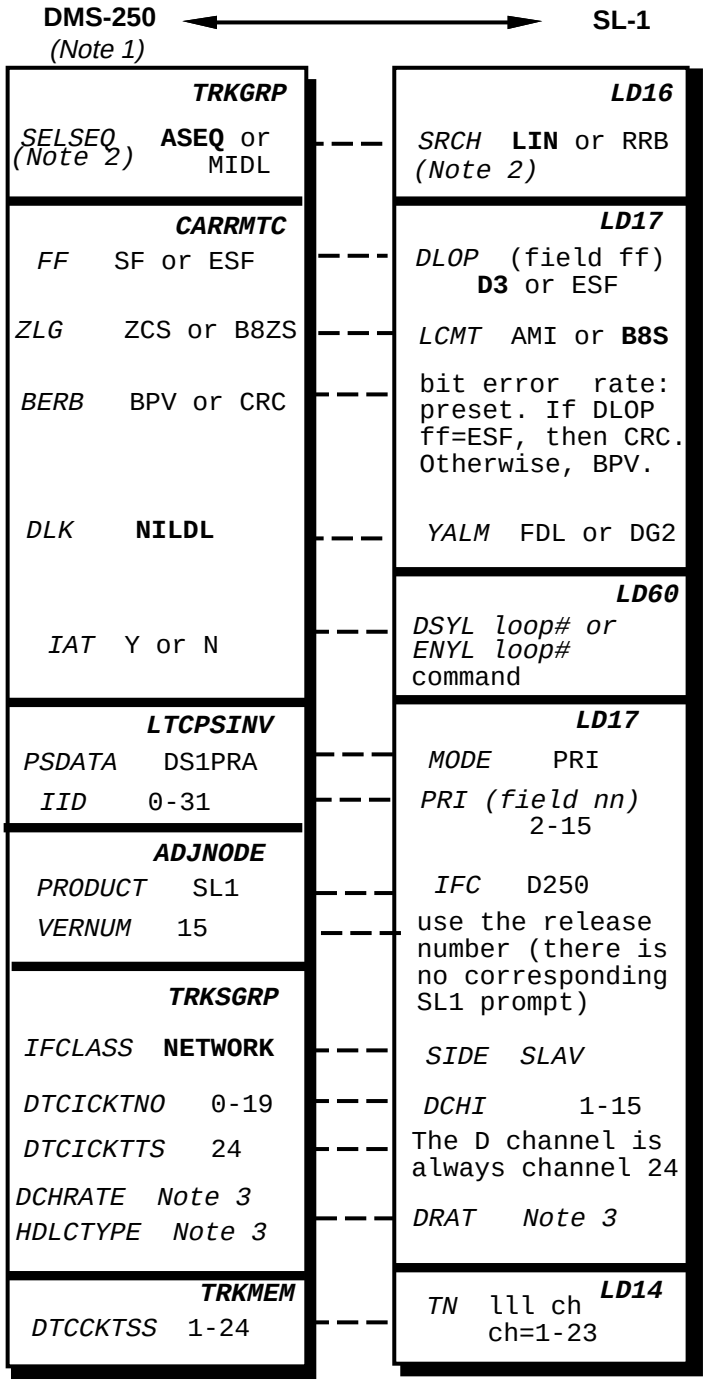
Note 2: DLK is used for transmitting yellow alarm. Use NILDL for nil data link; use FLD1 for input from timeslot 2, or FLD2 for input from external interrupt. Currently, only NILDL is supported.

Correlation tables

The correlation tables that follow show the parameters that must be coordinated between the near and far end for network service.

Note: Because ISDN is an evolving architecture, there may be some differences in datafill between different product types.

DMS-250 to SL-1 correlation table



Note 1:

Refer to *DMS-250 , PRI datafill dependencies* for required consistencies in the PRI interface.

Note 2:

The following combinations are valid:

DMS-250	SL-1
ASEQ	LIN
MIDL	RRB

Note 3:

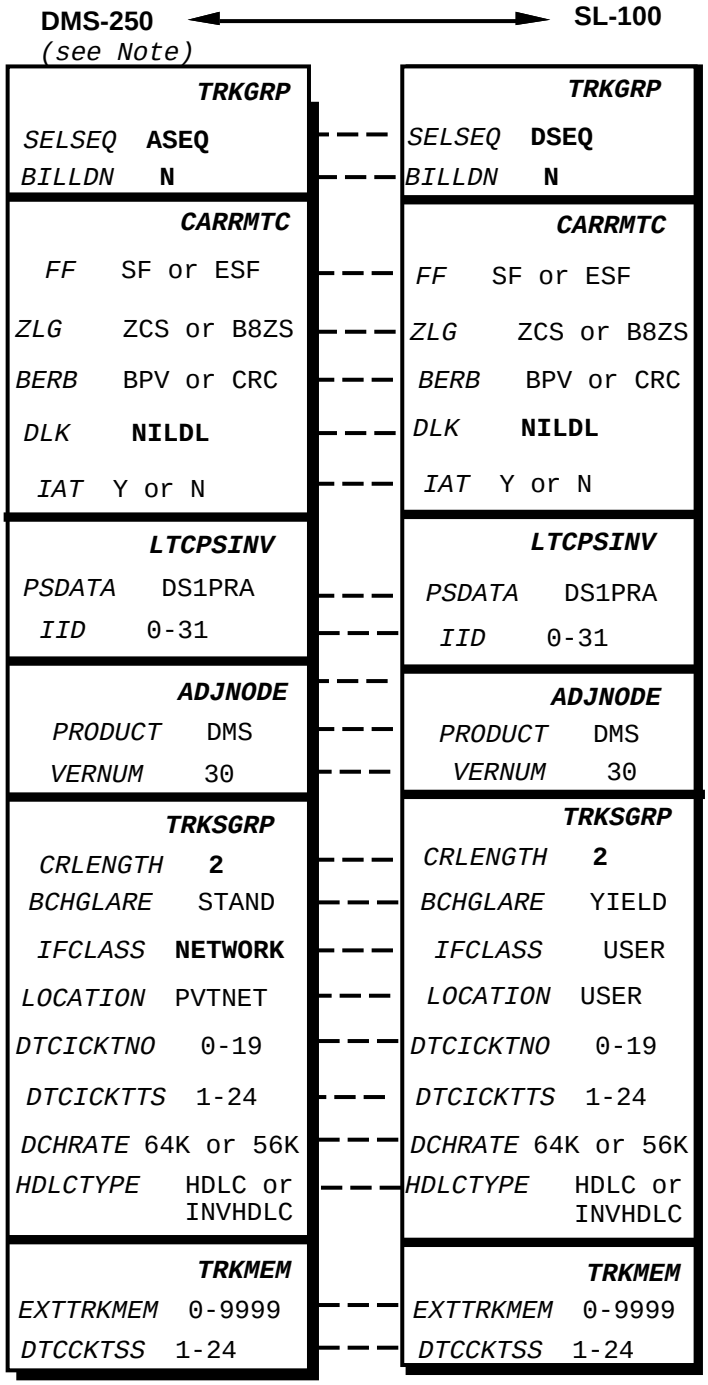
The following combinations are valid:

DMS-250		SL-1
DCHRATE	*HDCLTYPE*	*DRAT*
56K	HDLC	56K
64K	HDLC	64KC
64K	INVHDLC	64KI

Key

Prompts appear in *italics.*
Default appears in **boldface.**

DMS-250 to SL-100 correlation tables



Note:

Refer to *DMS-250 , PRI datafill dependencies* for required consistencies in the PRI interface.

Key
Prompts appear in *italics.*
Default appears in **boldface.**

Operational measurements DS1CARR OMs

The DS1CARR OMs monitor the performance of DS-1 lines for each carrier. This OM group has replaced the CARR OM group. Provisioning for the registers in the DS1CARR group is per DS-1 carrier.

> ***Note:*** These OMs correspond to Layer 1 (physical layer) in the Open Systems Interconnection (OSI) model.

The following OM pegs are accumulated for each DS-1 carrier for 24 hours and are reset when DS1LOF and DS1SLP are reset.

- DS1OMINFO Key to digital carrier equipment table
- DS1LCGA DS-1 local carrier group alarm
- DS1RCGA DS-1 remote carrier group alarm
- DS1BER DS-1 bit error rate maintenance or out-of-service limits exceeded
- DS1LOF DS-1 framing lost on the incoming side
- DS1SLP DS-1 frame slip
- DS1SBU DS-1 carrier busied out by system-originated commands
- DS1MBU DS1 carrier busied out by commands from the MAP
- DS1CBU DS-1 carrier in CSBY state (DTCI out of service)
- DS1PBU DS-1 carriers in PSBY state
- DS1BER DS-1 bit error ratio (replaces DS1BPV)
- DS1ES DS-1 error second
- DS1SES DS-1 severe error second
- DS1UAS DS-1 unavailable second

DCH OMs

The PRADCHL2 group contains the OMs for the D-channel signaling link . This OM group is pegged in the DTCI and collected from the PM just before the OM transfer from the active to the holding registers.

> ***Note:*** These OMs correspond to Layer 2 (link layer) in the Open Systems Interconnection (OSI) model.

PRADCHL2 registers are as follows:

- PRDDISCT Count of discarded transmit frames accumulated during one minute.
- PRDS0RX Count of successfully received SAPI 0 (circuit-switched data) frames accumulated over one minute.
- PRDRNRRX Count of RNR (Receiver Not Ready) frames received from peer accumulated over one minute.
- PRDCRC Count of frames received with CRC (Cyclic Redundancy Check) errors, accumulated over one minute.
- PRDSBMTX Count of link resets caused by ISP accumulated over one minute.
- PRDREJTX Count of REJ (Reject) frames transmitted by ISP.
- PRDDISCR Count of received frames discarded due to other errors, accumulated over one minute.
- PRDSBMRX Count of link resets caused by peer accumulated over one minute.
- PRDS0TX Count of successfully transmitted SAPI 0 (circuit-switched data) frames accumulated over one minute.
- PRDRNRTX Count of RNR (Receiver Not Ready) frames transmitted by ISD to peer accumulated over one minute.

TRK OMs

TRK OMs monitor call processing performance of the trunk group. Provisioning for the registers in the TRK group is per trunk group.

> ***Note:*** These OMs correspond to Layer 3 (network layer) in the Open Systems Interconnection (OSI) model.

The following OM pegs are accumulated over 24 hours and are reset when DS1LOF and DS1SLP are reset.

- OM2TRKINFO Trunk information fields: direction, total circuits,and working circuits
- INCATOT Incoming seizures
- PRERTEAB Abandoned incoming call attempts
- INFAIL Call origination attempts terminated unsuccessfully
- NATTMPT Calls routed to this trunk group
- NOVFLATB Call processing overflows
- GLARE Dropped calls due to glare
- OUTFAIL Unsuccessful outgoing seizures
- DEFLDCA Routed calls prevented from using this trunk group by network management
- DREU Directional reservation activated
- PREU Protective reservation activated
- TRU Trunks found in tk_cp_busy, tk_cp_busy_deload, and tk_lockout
- SBU Trunks found in tk_remote_busy, tk_pm_busy, tk_system busy, tk_carrier_fail, and tk_deloaded.
- MBU Trunks found to be in tk_man_busy, tk_seized, tk_nwm_busy.
- OUTMTCHF Incoming failures due to network blockage.
- CONNECT Outgoing seizures resulting in successful calls.
- TANDEM Incoming calls initially routed to an outgoing trunk group.
- AOF Incoming ANI failures (does not apply to PRI trunks).
- TOTU Sum of TRU, SBU, and MBU counts.

Treatment OMs

Treatment OMs monitor call processing performance of the trunk group. Treatments are routed to the originating PRI with the cause value in a DISC message.

Peg counts are accumulated according to five groups: Customer Unauthorized (CU), Customer Misc (CM), Equipment Related (ER), Feature Related (FR), Resource Shortage (RS). The treatments are mapped to these groups as follows (important items are in boldface):

- Customer Unauthorized: ADBF, ANBB, ANIA, CACE, CCNA, CCNV, CNDT, CNOT, D950, DACD, DCFC, **DNTR**, DODT, FDNZ, **FNAL**, HNPI, ILRS, INAC, INAU, INCC, IVCC, LCAB, MSCA, MSLC, N950, NACD, **NACK**, NOCN, ORSSRSDT, TDND, TESS, TINV, UMOB, UNCA, UNIN, UNOW, UNPR.
- Customer Misc: ANCT, ANTO, ATBS, ATDT, BLDN, BLPR, CFWV, DISC, OPRT, **PDIL**, **PSIG**, TDBR, TRBL, UNDN, UNDT, VACS, **VACT**, VCCT.
- Equipment Related: AIFL, **CONP**, ERDS, FDER, INOC, NCFL, NCUN, NMZN, NONT, PNOH, PTOF, RODR, SSTO, STOB, STOC, SYFL.
- Feature Related: **BUSY**, CCTO, CONF, MANL, MHLD, NCII, NCIX, NCTF, NINT, ORAC, ORAF, ORMC, ORMF, PGTO, PMPT, PRSC, RRPA, SRRR, TRRF.
- Resource Shortage: CGRO, CQOV, EMR1, EMR2, EMR3, EMR4, EMR5, EMR6, FECG, GNCT, **NBLH**, NBLN, **NCRT**, NECG, NOSC, **NOSR**, SORD, TOVD.

Basic call OMs

No OMs specific to Basic Call are provided in BCS 30. Use the trunk OMS to monitor call processing performance of the trunk group. No other PRI OMs apply.

Logs

Table 68 lists the DMS-250 logs that apply to DS-1 carriers.

Table 68
DMS-250 logs

Report ID	Alarm Info	Event Type	Event ID	Equip Type	Equip ID
PM109	No change	SYSB Generated when SYSB due to loss of sync, remote alarms, or DS-1 card is removed.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM110	NOALARM	INFO Generated when BPV or SLIP, MTCE, or OOS limits are set or cleared, or when the DS-1 card fails maintenance or is replaced.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM111	NOALARM	INFO Generated when a system-busy carrier is returned to service.	CARRIER CARRIER_NO: line_# REASON: char_string	pmtype	pmnbr
PM112	NOALARM	INFO Generated when a carrier slip counter is initialized.	CARRIER_SLIP_INIT	pmtype	pmnbr
PM186	NOALARM	INFO Generated as a general information log for carriers.	CARRIER CARRIER_NO: line_# REASON: char_string opt char_string	pmtype	pmnbr

Maintenance

Maintenance for the DTCI is the same as for the DTC. This section provides basic common maintenance procedures.

For successful call processing on the DMS-250 the following conditions must be met:

- The carrier must be in service (INSV).
- The PRI trunk must be in service (IDL).
- The calling and called lines must be in service (IDL).

DS-1 carrier alarms/display

Table 69 lists DS-1 carrier alarms that are displayed in the CARRIER level of the MAP. To access the carrier level of the MAP, use the following command:

MAPCI;MTC;TRKS;CARRIER

Alarms can be visual or audible alarms. The system provides automatic detection and recovery for most faults. If the system is able to recover, the alarm is cancelled and the event is entered into the system log.

The occurrence of errors is controlled by limits entered in table CARRMTC.

Table 69
DMS-250 DS-1 carrier alarms/display

Message	Effects	Remedy
RCGA Remote carrier group alarm (Yellow alarm) FAR END FAULT	Indicates remote alarm detection in receive path. The yellow alarm counter is incremented by 1 for every 10 secs of remote alarm. when the counter reaches 34, the counter is no longer incremented and the trunk is removed from service.	Check the far end.
LCGA Local carrier group alarm (Red alarm) NEAR END FAULT	Indicates a DS-1 card or transmission fault for transmit path.The DS-1 is removed from service; remote alarm pattern sent to far end.	1. Ensure that transmission parameters are correctly set at both ends (see *Correlation tables*). 2. Run a loopback test (see *Tests)*. 3. Run a continuity test (see *Tests*).
BER Approximated bit error rate. DS-1 DISPLAY	The counter is incremented for every 1K bit errors per day. For ESF, both BPV and CRC errors are reported.	Alarm settings can be altered by changing table CARRMTC

DS-1 carrier alarms/display (continued)

Table 69 (continued)
DS-1 carrier alarms/display

FRME Frame loss error DS-1 DISPLAY	Counter is incremented for every 1K bit errors per day. IF frame loss continues for 3 secs or more, the trunk is removed from service. It is restored automatically when frame sync is received continuously for 15 secs.	Alarm settings can be altered by changing table CARRMTC.
SLIP Frame slip (clock sync) error DS-1 DISPLAY	Counter is incremented per frame slip per day.	Alarm settings can be altered by changing table CARRMTC.
ES Errored seconds DS-1 DISPLAY		Alarm settings can be altered by changing table CARRMTC.
SES Severe errored seconds DS-1 DISPLAY		Alarm settings can be altered by changing table CARRMTC.
UAS Unavailable seconds		
State Carrier state DS-1 DISPLAY	Shows INSV, MANB, SYSB, UNEQ (trunks offline)	

DTCI commands

Table 70 provides the maintenance commands for the DTCI. This is the same set of commands as those used for the DTC.

Use the following MAP commandto enter the DTCI level of the MAP:

MAPCI;MTC;PM;POST DTCI xx

Table 70
DMS-250 DTCI maintenance commands

Command	Function
POST	Places the specified DTCI in the command position of the MAP.
LISTSET	Displays the current or all PMs in the post set.
TRNSL	Displays the status, message condition and capability of the C- or P-side links.
TST	Perform a controller self-diagnostic.
BSY	Busy the DTCI, one unit, or P-side link.
RTS	Return to service the DTCI, one unit, or P-side link.
OFFLINE	Put DTCI node offline (both DTCI must be in MANB first). **Note:** an offline DTCI will stay in this state over all restarts.
LOADPM	Load both units on the DTCI or select one unit (the unit being loaded must be in the BSY state first). The load file is from the CC.
DISPLAY	Displays the PM types and numbers associated with a particular state.
NEXT	Puts the next PM type in the posted set in the command position of the MAP.
QUERYPM	Displays the equipment location, load information, and the status of the DTCI.
QUERYPM FLT	Display the fault (if any) for each unit of the DTCI.
QUERYPM CNTRS	Display the name of the load for the DTCI.
SWACT	Causes an activity switch to the inactive unit of the DTCI.

DS-1 carrier commands

The carrier level performs all maintenance for PRI (DTCI) DS-1s. To access the carrier level of the MAP, use the following command:

MAPCI;MTC;TRKS;CARRIER; POST DTCI xx

The Display Option command displays the carrier options for the posted circuit, such as card code, options, and alarm thresholds.

A carrier can be looped towards the near (l) or far end (r) by using the following command. The loop is cleared using the (c) option.

LOOP n <l/c/r>

D- and B-channel commands

Although the PRADCH is designed mainly for D-channel maintenance, it can also be used for PRI B-channel maintenance (except for commands CONT and LOOPBK). B-channel maintenance can also use existing MMI commands.

Note: The control and post position displays are cleared when exiting the PRADCH level.

Use the following MAP command to enter the PRADCH level of the MAP:

MAPCI;MTC;TRKS;TTP;PRADCH

Note: The D-channel cannot be posted at the TTP level of the MAP. It must be posted from the PRADCH level under the TTP level. A B-channel can be posted at the TTP, MANUAL, MONITOR, or PRADCH level of the MAP.

Table 71
DMS-250 PRADCH maintenance commands

Command	Function
POST	Post one or more DS-1 circuits for maintenance. The options supported are: **GD** < CCLI> (post by group--use D-channel CLLI), **BD** < CCLI> (post D and B-channels), **D DTCI** <DTCI#> (post by PM> **D DTCI** <DTCI# CKT> (post by circuit#) **D DTCI** <DTCI# CKT TS> (post by circuit and timeslot) **T** <CLLI> <MEM> (post by trunk member--for B-channels only) The STA (State) field shows the state of the D-channel. See table x.
BSY	Busy out a circuit or put a circuit in the INB state using BSY INB.??
RTS	Return the specific channel to service. **Note:** If the DCH is INB, put the DCH in MB state with BSY before RTS.
NEXT	Put the next circuit in the post set in control position.
CONT	Run a continuity test on the a posted PRI D-channel (internal or external)
LOOPBK	Set loopback mode so that the far end is able to run an external continuity test.
HOLD	Place circuit in the hold position.

DTCI states

Table 72 lists the possible states for the DTCI. Note that each unit of the DTCI has a separate state and both units can be in the same state. For the states OFFL and CBSY, both units will always be in the same state.

Table 72
DMS-250 DTCI states

State	Description
CBSY	Both message links to network are out of service.
INSV	PM is in-service with no problems.
ISTB	One or both units installation busy PM overloaded PM load name does not match load name in LTCINV Static data mismatch CSlinks out of service Node redundancy lost Major CSlink failure Critical CSlink failure WARM SWACT turned off Warm SWACT not OK
MANB	Craftsperson has busied the PM
OFFL	PM is offline (software state)

DTCI states (continued)

Table 72 (continued)
DMS-250 DTCI states

State	Description
SYSB	System busy during CC initialization
	Diagnostics failed
	All C-side links are down
	Reset while in-service
	Trap message received from PM
	Autonomous activity drop
	Unsolicited messages limit exceeded
	Self-test failed
	PM audit detect fault
	Inactive unit lost data sync
	REX in progress
	REX failed
	RTS failed
	PM SWACT
	CS cleared RTS
	Audit detected inconsistent PM activity
	Audit detected inconsistent PM state
	No response from XPM during audit
	Require data load
	RTS rippling from C-side
	Messaging fail
	Reset limit exceeded
	ESA translation data downloading failed
	Data message threshold exceeded
	SWER message threshold exceeded
	Fault msg threshold exceeded
	Load corruption suspected
	Data corruption suspected/detected
	Incoming message overload condition

DS-1 carrier states

Table 73 lists the possible states for the DS-1 carrier.

Table 73
DMS-250 DS-1 carrier states

State	Description
INSV	DS-1 is in service; no alarms present.
MANB	Manual busy--DS-1 removed from service by craftsperson for maintenance.
OFFL	The DS-1 is offline.
SYSB	The DS-1 is system busy from a remote or local alarm.
UNEQ	The p-side port for the DTCI is unequipped (no datafill exists in table LTCPSINV). Any trunks datafilled for that facility will be offline.

D-channel states

Table 74 lists the possible states for the D-channels.

Table 74
DMS-250 D-channel states

State	Description
CFL	Carrier fail--the carrier is out of service or SYSB.
INB	Installation busy--D-channel is configured in datafill but is not in-service.
INSV	D-channel is in service and available.
LO	Lockout--link level (layer 2) or physical level (Layer 1) failure.
MANB	Manual busy--D-channel removed from service at the MAP.
PMB	Peripheral is MANB
RNR	Remote not responding-- the link is established and ready but the far end is not responding to PRI messages

B-channel states

Table 75 lists the possible states for the B-channels.

Table 75
DMS-250 B-channel states

State	Description
CFL	Carrier failed--associated DS-1 failure
CPB	Call processing busy--currently carrying traffic (service busy)
CPD	Call processing deload--circuit carrying traffic but another entity, such as MTCE has requested to be informed when CP releases circuit.
DEL	Deload--CPD circuit is now available.
DFL	D-channel fail--the D-channel is not in service so no signalling for B-channels can take place.
DMB	D-channel manually busy--the D-channel is MB.
IDL	Circuit in service and available; D-channel is in service..
INB	Installation busy--circuit is installed but not yet in service.
INI	Initialized--CPB circuits are initialized after a system restart
LO	Local failure of a circuit (no response from far end for this circuit).
MB	Manual busy--circuit removed from service by craftsperson for maintenance
NEQ	Not equipped--circuit hardware not provided.
PMB	Peripheral manual busy--the associated DTCI is out of service.
RMB	Remote manual busy--trunk for incoming calls removed from service by far end.
SB	System busy--circuit removed from service by system maintenance
SZD	Seized--circuit has been seized for manual or system action.

Tests

Table 76 below lists the tests for verifying network operation at the trunk or link level.

Be sure to BSY the PM at the DCTI level of the MAP before running the tests.

Table 76
DMS-250 tests

Test	Description	Procedure
DTCI Diagnostic	Performs a self-test on the DTCI PM	1. Enter the DTCI level of the MAP. 2. Enter **TST** to test the posted DTCI. 3. A card list is generated if the diagnostic fails. 4. If test fails, check the PM logs for additional information.
Internal Continuity Test	Verifies D-channel operation at the node level.	1. Enter the PRADCH level of the MAP. 2. Enter **POST GD** to identify the DCH. 3. Enter **CONT INT** to start testing.
External Continuity Test	Verifies D-channel continuity to the far end and back. The loopback at the far end must be set at the far end.	1. Enter the PRADCH level of the MAP 2. Enter **POST GD** to identify the DCH. 3. Contact the far end to ensure loopback mode is set using the **LOOPBACK SET** command. 4. Enter **CONT EXT** to start testing. 5. Ensure that the far end removes loopback mode with the **LOOPBACK TAKEDOWN** command.

TRAVER enhancements

The TRAVER is a customer-specific application for the DMS-250. Refer to the appropriate customer NTP.

Troubleshooting

Table 77 provides troubleshooting procedures for common problems.

Table 77
DMS-250 PRI troubleshooting

Symptom	Procedure
If the DCH is locked out (LO)	Verify the datarate in table TRKSGRP matches that of the far end. Verify the IFCLASS in table TRKSGRP. If connected to another DMS-150, the endpoints of the local connection should have opposite values. Otherwise, the DMS-1=250 is always NETWORK. Verify that the appropriate NT6X50 is in the DS-1 and correctly datafilled in table CARRMTC. Verify the correlation of the transmission characteristics for the link: frame format, line encoding,etc. Use the Protocol Analyzer to verify frame synchronization.
When FF=ESF, yellow alarm indicated when no yellow alarm is being transmitted from the far end.	Put the carrier back into SF format. Make sure the far end is not transmitting yellow alarm and wait for the LCGA to clear. Return the carrier to ESF format.

System name
Product name
Product name
Subcategory name

Address comments to:
ESN 6 - NTI - HELP
or cocos Peter Fournier, 8L15, BNR.

Release 3.0.1
Standard
October, 1989
Softcopy prepared in Canada.